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UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

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EADTU

Higher Education in the new normal: the role of online, blended and distance learning

Overview of papers as presented during the
Innovating Higher Education Conference 2021
3 - 5 November in Bari (IT)

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Message of Bari

Continuous professional development for digital education

The Corona crisis has radically changed the European higher education landscape.

During this period, all institutions established massive support for organizing digital lectures, tutorials and group sessions with different pedagogical approaches. Emergency decisions were taken at all levels. By doing so, higher education institutions have discovered the potential of digital higher education.

This is a momentum for continuing educational change by new pedagogies, building on this experience. But higher education institutions also feel the need for organizing an intensive professionalization of staff and creating of the necessary technological support structures to achieve high quality education. They want to connect with latest developments in the digitization of on-campus education, enhancing the first emergency pedagogies.

In response to these needs, EADTU partners have joined forces for the professional development of digital education, bringing together excellent expert schools, known for their research and innovation in digital teaching and learning and for developing good practices. They will support key approaches in post-Corona digital higher education: synchronous hybrid education, blended education and online distance learning,

Microcredentials

The coming years we will also see a growing focus on continuing education and professional development, stimulated by European and national policies on micro-credentials.

The European Commission will launch a Recommendation to the Council of Ministers on microcredentials by the end of 2021 and will develop a 2025 micro-credential plan to be integrated into the European Higher Education Area. This means that the recognition of microcredential qualifications will be discussed in all Member States in the broader framework of the European Higher Education Area from 2022 to 2025.

Our members are ready for this discussion. Several institutions and governments are already anticipating this policy, which promising for lifelong learning in all member states and in all institutions.

Microcredentials will have an impact on new qualifications for continuing education and professional development in line with the Bologna commitments and their integration in the European Aera of Higher Education. They should be designed in such a way that they are recognized by academia and employers. This requires a closer collaboration between higher education institutions and the labor market. Members of EADTU and the European MOOC Consortium noted a growing need in the economy and society for short learning programmes and microcredentials targeting a specific set of competencies.

The main next question concerns the qualifications to be awarded for microcredentials, understandable to learners, academia and employers to be integrated in in national and European qualification frameworks at higher education level. EADTU members are exploring qualification structures for continuing education and will enter in dialogue with the peer groups in the Bologna process.

Microcredentials will be a springboard for universities to develop a full-fledged area of continuing education and professional development. Universities have to prepare strategies and develop business models in conjunction with national funding schemes that make continuing education affordable, both for individual learners and for learners in companies.

Academic collaboration and mobility

EADTU welcomes the new Erasmus+ Programme of the European Commission. By integrating digital education and mobility, it promotes academic collaboration and mobility for ALL. On campus higher education institutions are now given the instruments to organize an international academic experience for all students. Lifelong learners can benefit from an international learning experience combining short physical with virtual mobility.

This makes continuing education and professional development more a reflection of society where people increasingly work in international and virtual networks. Working in these environments requires new competencies.

Openness, Diversity and Inclusion

Because of their mission, open and distance learning universities have always embraced the principle of equity in education. Therefore, they have continuously to re-think their role in national higher education systems. Opening up education means that open and distance education is responding to educational needs in society and in the economy.

The recognition of prior learning and experience is important for learners who wish to valorise what they learned already in the past, in higher education or in the workplace.
Talent should not be lost, but upgraded!

Openness means also that higher education institutions take into account diversity and inclusion, giving all citizens a fair chance for developing talent. Therefore, EADTU members explore challenges and share solutions for a variety of needs related to migrants and ethnicity, digital accessibility, gender, social inclusion, education for athletes, and artists, prisoners, and persons with functional disabilities

They will make an inventory of digital solutions which can support diversity and inclusion policies.

The European Area of Higher Education

EADTU welcomes the steps forward in the Bologna process regarding digital higher education and lifelong learning.

In the European University of the Future, lifelong learning takes on a much more important place as careers lengthen and up-skilling and re-skilling are needed to stimulate innovation and create an inclusive society. Lifelong learning will be organized in interaction with human resources in enterprises and sectors, innovation networks, competence centers and smart regions.

Digital education will provide tools for high-quality, accessible and scalable educational provisions for everyone, in emergency situations and beyond.

It is of great importance that the Commission, together with the Council of Ministers, can continue and strengthen its actions in the field of education. The European programmes enable European universities in many ways to lead the way in higher education policies and practices.

EADTU members will generously share educational expertise from 50 years of research, innovation and practices in the field to universities, governments and the European Union.

Keynotes / Panellists

We would like to thank our keynote speakers and panellists for their inspiring contributions to the plenary sessions of the conference.

Examples of micro-credentials offered/recognised by HEIs

Ricardo Mairal Usón

Pierpaolo Limone

Michael Murphy

Antonio Felice Uricchio

Rory McGreal

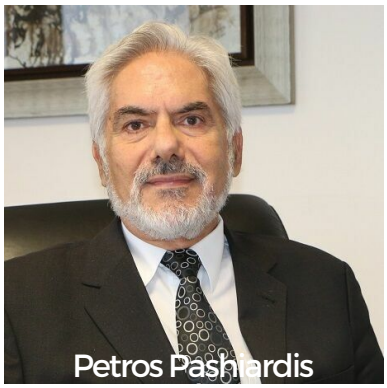
Magalie Soenen

Annelies Raes

Klaus-Dieter Rossade

Odysseas Zoras

Silvia Sivera


Petros Pashiardis

Björn Fisseler

Josie Fraser

Lizz Marr

Nicola Paravati

Table of Contents

Blended and Online Education

Digital transformation of placement learning experiences in GMIT in Ireland with an Online Employability and Careers Program 2
Ms. Bridie Killoran[1], Ms. Orla Skehill[1], Dr. Carina Ginty[1]
1. GMIT, Ireland

Employing the use of tablet PCs in instruction and partly automatising the assessment process of online university courses during the COVID era 20
Dr. George Kafentzis [1], Prof. Yannis Stylianou [1], Dr. Anna Sfakianaki[2]
1. University of Crete, 2. University of Crete & Hellenic Open University

Engaging distance online students through active methods: the example of concept maps 33
Prof. Tatiana Sanches[1]
1. UIDEF, Instituto de Educação, Universidade de Lisboa

Flipped Classroom and the conception of teaching to prevent drop outs 48
Prof. Mandy Schulze[1]
1. University of Applied Sciences Zittau/Görlitz

Hybrid mediation and Digital Scholarship in Higher Education 58
Dr. Loredana Perla[1], Mrs. Viviana Vinci[1], Mrs. Alessia Scarinci[1]
1. University of Bari Aldo Moro

INNOVATION IN DISTANCE HIGHER EDUCATION. TRENDS AND TOPICS. 71
Dr. Maria-Carmen Ricoy [1], Prof. David Recio-Moreno [2], Prof. Salvora Feliz-Ricoy [3], Dr. Tiberio Feliz Murias[4]
1. Universidade de Vigo, 2. UNED, 3. Universidad Politécnica de Madrid, 4. Universidad Nacional de Educación a Distancia (UNED)

Pedagogical Innovation and Distance Education in Higher Education in the (post-)COVID era 81
Dr. Perpétua Silva[1], Dr. Marisa Correia[1]
1. Polytechnic Institute of Santarém

Strategies to counter and prevent the online hate speech. A proposal for future teachers and educators 96
Mrs. Rosa Palermo[1]
1. University of Bari Aldo Moro

Understanding online professional networking behavior of international business students 108
Dr. B Hendrawan[1], Dr. Nikos Misirlis[1]
1. HAN University of Applied Sciences

Using technologies to re-imagine the assessment of professional placement in initial Teacher Education 119
Dr. Mary Kelly[1], Ms. Elva Casey [1]
1. Hibernia College

Enhancement and extension of the printed book: An online gamification model to com-plement educational textbooks 120
Prof. Vitor Rocio[1], Prof. José Bidarra [2]
1. Universidade Aberta, INESC TEC, LE@D, 2. Universidade Aberta, CIAC, LE@D

Experiences of online social presence in professional doctorates 130
Dr. Philippa Waterhouse [1], Dr. Carol Azumah Dennis[1], Dr. Inma Alvarez [1]
1. The Open University, United Kingdom

On-line Learning and Higher Education Programmes: How Adult Students cope with emerging Issues and Challenges in the Covid-19 and post Covid-19 Era. A Case Study 142
Dr. EMMANOUIL SOFOS[1]
1. Hellenic Open University

Teaching Resources Platform for Online, Blended, and Autonomous Learning 150
Prof. Sabine Bottin-Rousseau[1], Mr. Andriamanantenasoa Nirina[1]
1. Sorbonne University

Diversity & Inclusion in Open & Online Education

INCLUSION OF STUDENTS WITH DISABILITIES AT UNED. LESSONS LEARNED 162
Mr. Víctor Alberto Lorenzo Pérez [1], Ms. Inmaculada Vázquez González [1], Dr. Tiberio Feliz Murias[2]
1. Spanish University for Distance Education (UNED). Predoctoral Researcher UNED-Santander, 2. Department of Didactics, School Management and Special Didactics, Faculty of Education, Spanish University for Distance Education (UNED)

Micro-credentials for continuous education (Short Learning Programmes and MOOCs)

Analysing students' rating of the SLP Digitally Competent Educators 172
Prof. Glória Bastos[1], Prof. Eva Cendon [2], Prof. Mehmet Firat [3], Ms. Aysun Günes [3], Dr. Leena Hiltunen[4], Dr. Sanna Juutinen [4], Ms. Päivi Kananen[4], Dr. Virpi Uotinen [4], Ms. Magda Zarebski [2]
1. Universidade Aberta, 2. FernUniversität in Hagen, 3. Anadolu University, 4. University of Jyväskylä

Experiences gained from an e-learning Short Learning Programme on the Introduction of Waste Management developed for graduates of all disciplines 184
Dr. Hrissi Karapanagioti[1], Prof. Ioannis Kalavrouziotis [1]
1. School of Science and Technology, Hellenic Open University, Patras, Greece

Learner Focused Multi-campus Micro-credentials: Lessons from Irish Universities 191
Dr. Emma Francis[1], Mr. Lewis Purser [1], Dr. Lynn Ramsey[1], Ms. Nora Trench Bowles [1]
1. Irish Universities Association

Using a blended approach to enrich MOOCs on Finnish education 201
Ms. Päivi Kananen[1], Mr. Ari Kiviniemi[1], Ms. Liisa Kytölä[1], Ms. Minna Nykopp[1]
1. University of Jyväskylä

European university networks, internationalisation and virtual mobility

Awareness, Experience and Organizational Maturity of Open Education 217
Ms. Katharina Kunze[1], Prof. Ulf Ehlers[1]
1. Baden-Wuerttemberg Cooperative State University Karlsruhe (DHBW)

Creating value in continuous digital education - Setting standards for learning opportunities based on collaboration, openness, and modularity 232
Mr. Mike Bernd[1], Mr. Stefan Göllner[1]
1. AI Campus / Stifterverband

Quality Assurance in Blended and Online Education

An assessment of the quality of French distance education programs 244
Dr. Pierre Beust[1], Mr. Ali Aksen [2], Ms. Angélique Bègue [3], Ms. Virginie Bracque [4], Mr. Jean Delaballe [5], Ms. Joëlline Pradier [3], Ms. Sarah Villanie [6]
1. French Higher Education Ministry & Caen Normandy University, 2. Campus connecté of Privas, 3. Campus connecté of Saint Raphaël, 4. Campus connecté of Aubenas, 5. Campus connecté of Carcassonne Agglo, 6. Campus connecté of Romans en Isère

Artificial Intelligence in Teaching and Learning

Artificial Intelligence in teaching and learning: How the promised land can be converted into hell 253
Dr. Eirini Artemi[1]
1. School of Humanties-Hellenic Open University

Educational Bots in Higher Education Distance Learning 262
Ms. Cathrin Vogel [1], Mr. Florian Rapp[1]
1. FernUniversität in Hagen

Staff Support Services in Online and Distance Education

CREATION OF A DIGITAL ACADEMIC CHAMPION TEAM AND THE IMPACT ON TEACHING PRACTICE AND STUDENT ENGAGEMENT, SUPPORTED BY THE DIGITALED.IE HIGHER EDUCATION PROJECT IN IRELAND 264
Dr. Carina Ginty[1], Ms. Annette Cosgrove[1]
1. GMIT, Ireland

Staff Support services and Digital Education in Nigeria: A Survey of Selected School Teachers in Abuja. 280
Mrs. Ntite Orji Kalu[1]
1. Masaryk University

Online Education in the (post-)COVID era

A MOOC Inclusive Platform Open to Deaf Role Models 293
Dr. Vassilis Kourbetis[1], Prof. Anastasia Alevriadou [2], Mrs. Syridoula Karipi [3], Prof. Stella Giaouri [3], Mr. Dimitris Passos [4]
1. Hellenic Open University, 2. Aristotle University of Thessaloniki / Hellenic Open University, 3. University of Western Macedonia, 4. Open Pedia

Applying on-line active participatory teaching techniques during the COVID-19 pandemic in the School of Pedagogical and Technological Education (ASPAITE), Greece. 305
Dr. ATHANASIA DAKOPOULOU[1]
1. Laboratory Teaching Staff - School of Pedagogical and Technological Education (ASPAITE)

E-engineering Practical Resources Adaptation for the Use of VISIR within the European e-LIVES Project 316
Dr. Blanca Quintana[1], Dr. Clara Perez Molina [1], Dr. Félix García-Loro [1], Dr. África López-Rey [1], Dr. Elio Sancristobal [1], Prof. Manuel Castro [1], Dr. Sergio Martin [1]
1. Electrical and Computer Engineering Department (DIEECTQAI), Industrial Engineering School (ETSII), Spanish University for Distance Education (UNED)

Enabling the digital leap: Pedagogical leaders transitioning from adopters to innovators in a digital learning ecosystem 331
Dr. Emma O Brien[1], Dr. TJ O'Ceallaigh[1]
1. Mary Immaculate College, Limerick

Monitoring Greece's teachers opinion for Distance Learning in Covid-19 era. 338
Dr. Eleftherios Protopapas[1], Mr. Christos Kyriazis [2], Mr. Sotiririos Stogias [2]
1. NTUA, 2. Hellenic Open University

Non typical workplace learning in Greece during the pandemic 351
Dr. Tonia Chartofylaka[1], Dr. Ilias Mavroidis [1], Dr. Evangelia Manousou [1], Prof. Maria Koutsouba [1], Prof. Ioannis Giossos [1]
1. Hellenic Open University

Remote electronic examinations in the Hellenic Open University during COVID-19 pandemic: Student and faculty perceptions 364
Dr. George Vorvilas [1], Dr. Alexandros Liapis[1], Mr. Alkis Korovesis [1], Dr. Dimitra Aggelopoulou [1], Dr. Nikos Karousos [1], Prof. Efstathios Efstathopoulos [1], Prof. Odysseas-Ioannis Zoras [1]
1. Hellenic Open University

Smart Gamification based on Multiple Intelligence Theory in STEM Modules 378
Prof. Frank Ulrich Rückert [1], Ms. Xenia Hülsmann[1], Mr. Andy Junker [1]
1. Hochschule für Technik und Wirtschaft des Saarlandes

Technological change as a force for good: when the Jedi get working 386
Ms. Maria Kantirou[1], Dr. Klaus-Dieter Rossade[1]
1. The Open University

Applications, tools, and teaching methodologies in synchronous and asynchronous online in-struction in TESOL courses 401
Dr. KOSMAS VLACHOS[1]
1. Hellenic Open University

Open Education and MOOCS, European MOOC Consortium

Current state of MOOC recognition in Europe 415
Ms. Lucía Santiago Caamaño[1], Mr. Martín Naya Varela [1], Mr. Vicente Díaz Casás [1]
1. University of A Coruña

Changing the Pedagogical Landscape: New Competences for Teachers

A national project enhances language teachers' professional competence 424
Ms. Kirsi Korkealehto[1], Dr. Jaana Kullaslahti[1]
1. Häme University of Applied Sciences

Academic development program in blended format 431
Dr. Vassiliki Michou[1], Ms. Laetitia Pereira [1], Ms. Oleksandra Vereschak [2], Ms. Eléonore Ferrier-Barbut [2]
1. Sorbonne University, 2. Sorbonne University - ISIR

BUILDING DIGITAL TEACHING AND LEARNING CAPABILITIES IN IRELAND WITH THE DIGITALED.IE KNOWLEDGE PLATFORM 445
Dr. Carina Ginty[1], Ms. Annette Cosgrove[1], Ms. Jessica Duffy[1], Ms. Orla Skehill [1]
1. GMIT, Ireland

Children's Right to Participate in Early Childhood care and Education settings and relative innovatory supportive digital tools for ECCE professionals' development 461
Dr. Elias Stavropoulos [1], Mr. Christopher Karachristos[1], Prof. Konstantinos Petrogiannis [1], Prof. Cecília Aguiar [2], Dr. Nadine Correia [2], Dr. Olga Wysłowska [3], Prof. Helena Taelman [4], Prof. Efthymia Penderi [1]
1. Hellenic Open University, 2. Iscte-Instituto Universitário de Lisboa, Portugal, 3. University of Warsaw, 4. Odisee, University of applied sciences

Re-thinking the ABC-LD workshop at 4EU+ Alliance 476
Dr. Dimitrios Alchatzidis [1], Dr. Marta Jaworska-Oknińska [2], Prof. Bartłomiej Michałowicz [2], Dr. Vassiliki Michou[1], Mrs. Anna Pacholak[2], Mrs. Angela Maria Prataviera [3], Mrs. Dorota Sidor[2], Prof. Zbynek Tonar[4]
1. Sorbonne University, 2. University of Warsaw, 3. University of Milan, 4. Charles University

Teachers´ experiences of success in remote learning 494
Dr. Jaana Kullaslahti[1], Mr. Hannu Ikonen [2], Dr. Sirpa Laitinen-Väänänen [2], Mrs. Paula Tyrväinen [2]
1. Häme University of Applied Sciences, 2. JAMK University of Applied Sciences

OER Competence Framework & Self-assessment Questionnaire for "Digi-Teachers" 503
Dr. Maria Perifanou[1]
1. Hellenic Open University

Online Assessment

Can e-assessments be more than just an 'emergency solution'? - Higher education readiness for online assessments versus room for improvement. 516
Dr. Jasmin Sera[1], Dr. Tilia Stingl de Vasconcelos Guedes [1], Dr. Georg Feldmann [1]
1. FHWien der WKW University of Applied Sciences for Management and Communication

Experience with an Online Assessment in a Lecture about Fundamentals of Electrical Engineering 531
Dr. Mathias Magdowski[1], Prof. Ingo Siegert [1]
1. Otto von Guericke University Magdeburg

Blended and Online Education

Digital transformation of placement learning experiences in GMIT in Ireland with an Online Employability and Careers Program

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Abstract
In 2020, GMIT's rapid response during the pandemic resulted in the development of a bespoke accredited online careers education program. This digital transformation was endorsed by the Institute's Blended and Online Learning Transformation (BOLT) initiative, as an essential module for students who had their placements cancelled. Through dedication, collaboration and innovation among staff from the GMIT Careers Centre, the Teaching and Learning Office, and Schools of Business, Engineering, Science and the Hotel School, 400+ students engaged with the course, from November 2020 to April 2021.

The online module is visually appealing and interactive with the use of tiles, web design and bespoke iconography to lead the student through a narrative of self-discovery, career exploration, job preparation, application and the world of work. A curated collection of career materials and exercises enabled the students to learn and explore in a self-directed manner benefiting from a wide selection of interactive and reflective content developed using Articulate Rise and H5P. This presentation will showcase features from the course and share student and educator feedback from their engagement with the GMIT Online Employability & Careers Program.

Keywords: Digital, Embedded Careers, Alternative Placement, Online, Innovative, Agile.

1. Introduction

Galway-Mayo Institute of Technology (GMIT) in the West of Ireland, operates in a wide geographical area across five campuses in Galway City, Castlebar (Mayo Campus), Letterfrack and Mountbellew, delivering both accredited and customised programmes of learning, ranging from apprenticeship to PhD awards on the National Framework of Qualifications (NFQ). GMIT has a student population of 8,000 + students and over 700 total staff numbers with an Academic / Students Ratio of 15:1. There is an excellent academic / student ratio and this is beneficial in that the courses are very practical in nature with applied learning. The Institute has a strong regional presence in that the majority of the student population are from the western region. Each year we have approximately 2,000 graduates, and for those entering employment, 63% find their first job in the western region. (Ref: First Destination Report GMIT 2019) GMIT is a member of the Connacht-Ulster Alliance(CUA) with IT Sligo and Letterkenny IT, and is working towards achieving Techoogical University (TU) status.

2. Rationale

2.1 National Context

In recent years, both in Ireland and the UK, governments are addressing the importance of employability skills of graduates from Higher Education Institutions and this has influenced policy, with for example the HEA giving specific direction to HEI's in areas such as work based learning and employability statements. There are also other drivers to developing employability at institutional level. For example, in today's modern economy, employers are expecting Higher Education Institutions to embed generic or employability skills more fully into the curricula (IBEC 2010).

Government reports, all discuss importance of employability skills:

i. Ireland's Industry 4.0 Strategy 2020-2025
ii. Future Jobs Ireland 2019: Preparing Now for Tomorrow's Economy, Government of Ireland, 2019
iii. Project Ireland 2040 National Development Plan
iv. Enterprise 2025 Renewed: Building resilience in the face of global challenges, Department of Business, Enterprise and Innovation, 2018

Student employability is central to GMIT's strategic plan. The GMIT Mission Statement states that GMIT will "Develop confident, professional, knowledgeable and skilled graduates who are equipped to contribute as global citizens." (GMIT, 2019) Embedding employability will prepare students to succeed both professionally and personally and to contribute meaningfully to their community and society.

The development of accredited careers education module has given students an opportunity to develop their knowledge, skills, and competence in relation to developing personal plans, creating their profiles, understanding their sector, and preparing to interact with employers. This is a first step in embedding careers education and employability into the curriculum as a specific module. The module is ideal to be used as part of an alternative to placement or even more broadly as an elective. This project was a positive step for GMIT to demonstrate its commitment to more meaningful career and employability development.

- Graduate employability needs to be a central feature on all academic programmes in order to prepare graduates to compete in the dynamic, knowledge led economy
- The initiative was an important step in trying to embed the elements of employability and using the language of employability into academic programmes to make employability more obvious and accessible to all stakeholders.
- Employability initiatives needs to reflect the changes to the GMIT student profile in order to be effective for the complete student body, embracing diversity, inclusion, access & disability.
- The recent survey of employers in Ireland[1] carried out by the Association of Higher Education Career Services (AHECS) findings indicate that graduate recruitment will decrease by at least 40% in 2021. There is also a predicted decrease in the number of placements available for students. As a result, almost all third-level and further education colleges in Ireland will have to seek alternatives to work placement

[1] https://www.ahecs.ie/wp-content/uploads/2020/10/AHECS_GMS_2020-final-soft-copy.pdf

- In 2019, The GMIT Careers Officer led out on the development of an **Employability Statement** and Employability Framework which outlines the Institutes overall approach to employability and the supports available to both students and graduates. This was completed in GMIT in 2019 with guidance from the steering committee nominated by the Institute's registrar. This statement was approved by Academic Council and is available on www.gmit.ie website.

In 2021 employability became one of the key themes for academic programmatic review which ultimately will have an impact on all students across all courses and campuses.

The Online Employability Module, The Next Step – Transition to Work was launched in 2020, just before Covid and was in place when all teaching had to be transferred to an online environment. The module reflected the modern and accelerated changes that was happening in the workplace e.g. on-line recruitment. "The Next Step - Transitioning to Work" online Careers Module (five credit Level 7 module) aims to develop the learner professionally and personally and equip them with the skills and knowledge to enable them to plan for and achieve their lifelong career goals. The module is aligned to the Galway Mayo Institute of Technology's (GMIT) Employability Statement and Framework (GMIT, 2017) which highlights the Institute's commitment to working with employers, ensuring that graduates are prepared for a constantly changing world of work. The model that underpins both the Employability Statement and Employability Module in GMIT is the CareerEDGE model, developed by Darce, Pool and Sewell (2007). The Next Step careers module combines state- of- the- art technology and traditional live discussions informed by enterprise, delivered through on-line workshops to facilitate, and guide students' actions and reflections as they develop and fine- tune a career portfolio. This module can be delivered as a blended or online module to all interested students in Galway Mayo Institute of Technology and the CUA (Connacht Ulster Alliance).

Figure 1: Galway Mayo Institute of Technology Employability Framework

3. Literature Review

In the process of developing an employability framework for GMIT, we engaged with various theories developed for employability, and how universities and institutes of technology implement employability programmes, particularly the pedagogy of employability. We discovered different institutions, careers professionals, academics, employers and indeed individuals will interpret employability in ways relevant to their own context and priorities. There is indeed significant discussion over what is actually meant by employability and whether it is useful to define employability purely in relation to development of skills (Hinchliffe and jolly, 2011; Edge and SCRE, 2011).

Looking at an international definition for Employability Skills from the Commonwealth of Australia "skills required not only to gain employment, but also to progress within an enterprise so as to achieve one's potential and contribute successfully to an enterprise strategic directions".

Employability has both a narrow and broad focus in that the first focus is on the quality of immediate employment, generally measured by the Graduate Outcomes Research carried out on behalf of the Higher Education Authority (HEA) by all the Irish third level colleges 6-9 months after graduation. This is a very crude measure and as it doesn't allow the necessary time for a graduate to make the transition to achieve graduate level position and also even trying to classify what is a graduate level job is very problematic. The data does not measure if the job taken up by the graduate makes use of graduate competencies. The second focus taken in relation to employability is on "immediate employability" – whether the student has the competencies and attributes to do a graduate job, in other words to- hit the ground running! The third has a broader focus in that it looks at sustainable employability. York and Knight (2006) state that employability "does not rest when the first graduate job is achieved but needs to be continually renewed to be sustainable". This view broadens the focus to include a wider range of attributes required to be successful within employment and also includes the attributes required to manage one careers development.

Third level institutions have their own discretion to decide the focus they give to employability skills and as a result there is much variation in the approach institutions have taken in embedding employability skills into the curriculum. The USEM employability model offered by York and Knight (2006) draws on the work of Marzano (1998) who analysed the impact of teaching intervention. He highlights that four aspects of human thought operate in all situations:

- Knowledge
- The cognitive system
- The metacognitive system
- The self-system

Therefore the model of sustainable employability is central to the careers education model. Stanbury defines careers education as "those formal processes that empower individuals to identify develop and articulate the skills, qualifications, experiences, attributes and knowledge that will enable them to make an effective transition into their chosen future and manage their careers as lifelong learners, with a realistic and positive attitude".

Watts et al. (2002:351) state that careers education can act as "the interface between the individual and society, between self and opportunity, between aspiration and reality" Law and Watts (1977) developed a conceptual model which has a framework of four components considered to be fundamental to careers education:

- *Self- awareness* - the ability to identify and articulate motivations, skills and personality as they affect career plans
- *Opportunity awareness* - knowledge of opportunities available and how to reach them
- *Decision making* - being able to weigh up personal factors to make a well informed and realistic career plan
- *Transition learning* - understanding how to seek and secure opportunities

This process needs to be dynamic, as the individual will need to relate their understanding of themselves to the opportunities available before arriving at and attempting to implement any career decisions. Jarvis (2006) outlines the new career management Paradigm, which is less about making the right occupational choice than about equipping people with competencies to make the many choices they are faced with continuously in all aspects of their lives. In his Blue Print for Life, he identifies core career management competencies and performance indicators at four developmental levels across one's lifespan. The competencies are arranged around three domains:

- Personal management
- Learning and work exploration
- Life/ work building

Jarvis links the failure to engage people in career management to potential economic damage. Human capital theory will be successful if humans at the heart of it remain unfilled. Jarvis argues that even with good information and job search skills, *If a person expects to fail again (competency 1), has poor communication and teamwork skills (competency 2), complains about change rather than embracing it (competency 3), is not open to learning and innovating (competency 4), and cannot balance life and work effectively (competency 9) they will probably not keep a job long if they are fortunate enough to secure one. Moreover, they will likely not find satisfaction and fulfilment in the job, and their employer is not likely to enjoy high productivity from his employee.*

3.1 An Employability Model for GMIT

The key to employability (CareerEDGE) model was developed by Lorraine Darce Pool and Peter Sewell from the University of Central Lancashire, incorporating the York (2006) definition into a framework that is accessible and allows development of personal and reflective skills of students toward building careers. Five critical elements are identified that need to be addressed in order that graduates can find both satisfied and be successful in their occupations.

- Career Development Learning;
- Experience (work and Life)
- Degree Subject Knowledge, Understanding & Skills.
- Generic Skills; and
- Emotional Intelligence.

The authors argue that when students have support in reflecting on and evaluating their development in these areas, it leads to enhanced self- efficacy, self- esteem and self- confidence and to greater prospects for employability.

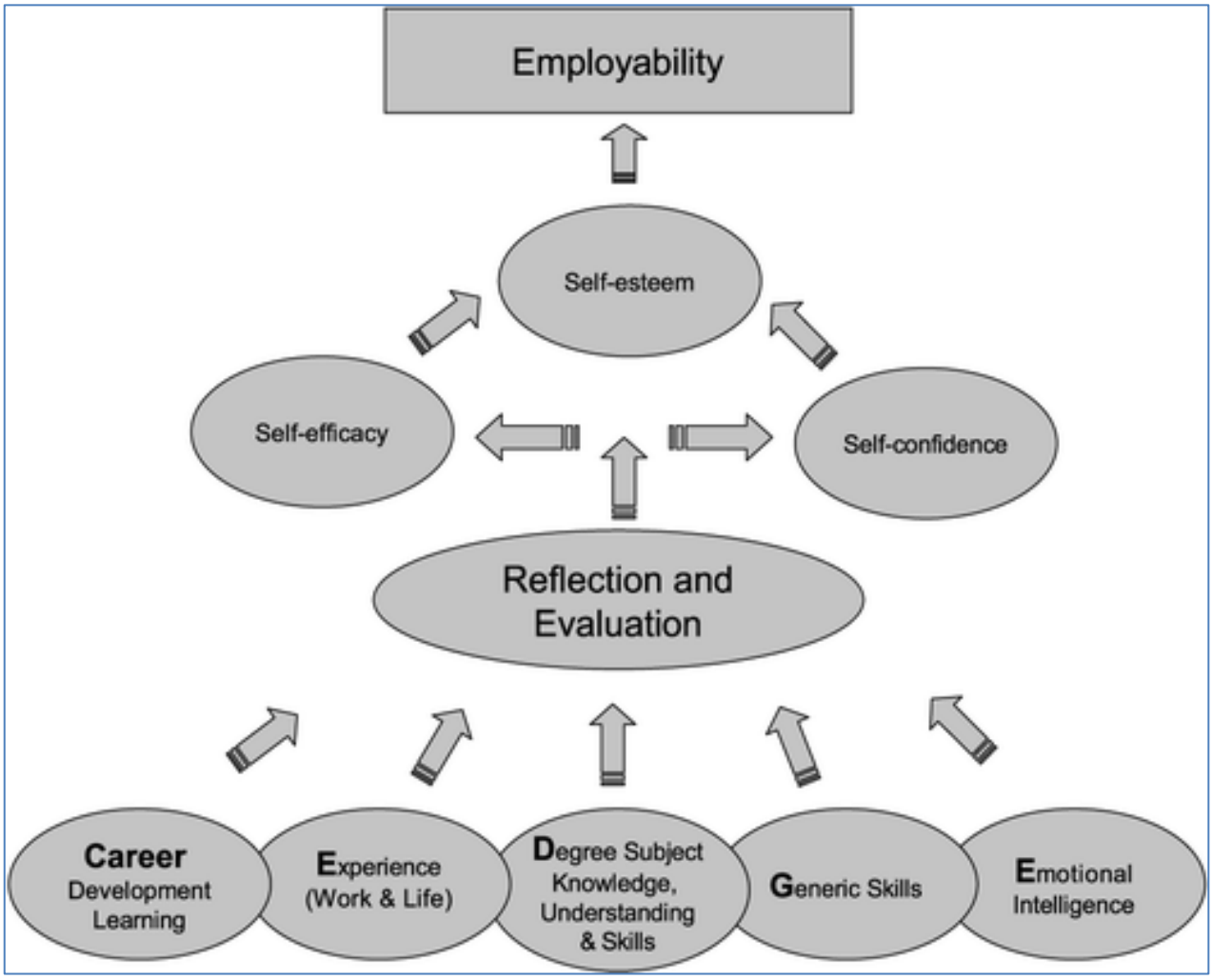

Figure 2: An employability model (Darce Pool and Sewell, 2007)

4. Development of the Careers Module

The module offers a blend of online and live learning. Students can avail of group discussions and receive individual feedback on written submissions, which have been informed by enterprise best practice. The module includes state-of-the-art learning technology such as online psychometric assessments and career development software tools. Students may choose to progress through the module using the completely on-line format, availing of recorded content and the online discipline bespoke resources. During live delivery of the module, the content can be varied to cater specifically for the programme of students attending at that time.

The module benefits from the support of GMIT's Career Services, who constantly consider developments in the discipline and professional practice. The Moodle page carries links to Career Services and to Career Services Twitter and contains links to CareersConnect, an interactive element that is available for employers to upload information and vacancies, and to students who are seeking employment.

4.1 Structure

The learner is brought through **three key stages** of Employability:

STAGE 1: Student Self Awareness

- Personality & Strengths Profiling
- Skills & Competencies
- Industry Sector Analysis
- Emotional Intelligence
- SWOT Analysis
- Career Development Plan

STAGE 2: Recruitment & Selection Process

- Understanding the Selection & Recruitment Process
- CV & Branding
- LinkedIn Profile & Online Presence
- Elevator Pitch
- Job Description Analysis
- Assessment Centres
- Interview Process & Techniques, etc.

STAGE 3: Students first 100 days in the workplace

- First 100 Days in the workplace

4.2 Technology Enhanced Learning:

The latest technology was employed and incorporated into the module allowing students to become familiar with the new employment recruitment technology now being used by employers. Students engaged with all of the virtual tools even the challeging elements such as Online Video Interviews. 80% of the students reported finding the online virtual mock interviews shown in figure 3 below, either excellent, very good or good and 74% of students reported they found the mock interview feedback excellent, very good or good.

The recruitment software used included:

- Artificial Intelligence CV Review Software
- Online Mock Interview Software.
- Strenghts Profile psychometric and careers assessment
- Virtual Careers Fair Software
- Virtual Chats

- Guidance Psychometric Testing Online

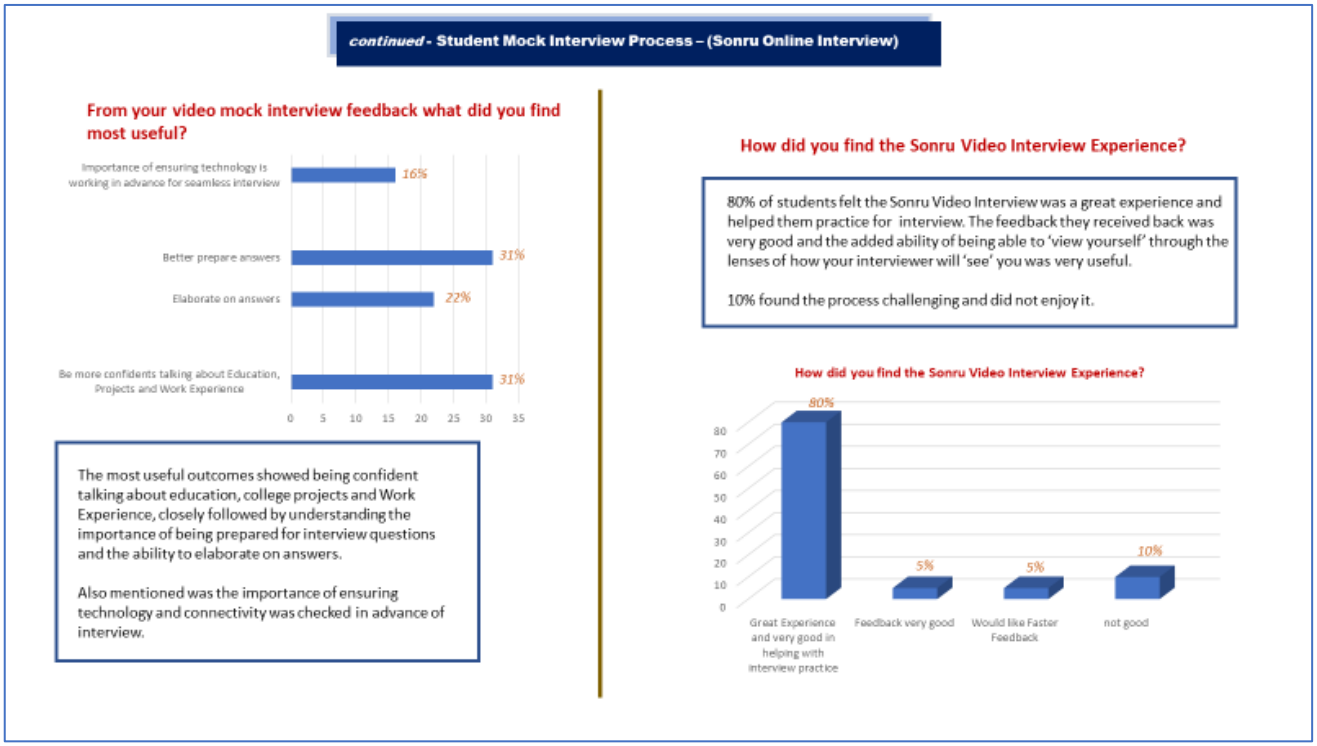

Figure 3: Student mock Interview process, using online interview software

4.3 Discipline Specific Career Materials

A catalogue of bespoke career materials was researched, prepared and incorporated into the module for all disciplines and career sectors. This allowed students to customise their career portfolio materials such as CVs and cover letters to include the relevant technical and transferable skills for the different employment sectors.

4.4 Module Design

The design of the module was creative and distinctive, and the user experience was enhanced by strong elements of instructional design using iconography, built-in activities using HP5 on a Moodle platform. Other aspects to the design included:

- Strong integration of theory and practice throughout module content
- Transparent pedagogic framework
- Introductory videos for each section with clear learning outcomes and methods, activities and timings
- Easy-to-use materials (e.g. websites, activity sheets)
- Assessment strategies linked to learning outcomes
- Suitable for curriculum and non-curriculum-based delivery

- Embedded into the curriculum, thus optimising student engagement and learning.
- The modules can also be delivered flexibly within the extra or co-curricular framework and can reside within an employability awards framework.
- A modular intervention allows employability departments to work in partnership with academic leads to provide tailored solutions to strategic priorities such as placement uptake and retention.
- Modules also enable departments to be flexible and responsive to changes within the graduate labour market.

The modules were designed through co-creation with stakeholders including employers and students and were delivered using a range of creative and innovative teaching and learning practices.

These included flipped classroom activities, individual research, paired discussion, mobile interaction, and self-directed learning and assessment.

4.4 Student Engagement

- ***678*** students from four schools within GMIT completed the Online Careers Module- 378 for credit purposes and a further 300 + as a standalone module.
- The cross-disciplinary nature of student groups completing the module allowed for better student engagement from different courses and allowed for more cross disciplinary employability projects. The on-line nature of this accredited module allowed for a highly efficient use of time and resources for a large number of students.
- There was approx. 50% increase in the numbers of students getting access to CV reviews and approx. 70 % to mock interviews. The online delivery made it easier to timetable cross-disciplinary and employer workshops. Quality was enhanced with excellent on-line packages and individual coaching was still possible.
- Figure 4 below outlines *The Student Activity Report* .The most used online element was the section focused on “Your Skills”, which included traditional self-discovery techniques such as: “SWOT diagram” (17,273 views) and a presentation on “Skills every college student has” (17,238 views) along with the modern “SKILLZ” resource (17,157 views) The second most widely consulted online element was the section focused on “Finding the Job” which appealed to students with features such as “Review the job description” (17,027 views).“Apply for the job” section contained the ever-relevant topic “About yourself” (17,130 views)

GMIT Online Careers Module

Student Activity Report 2020-2021

1.1 Your Strengths		
Strengths Profile	1876 views	386 users
Strengths Profile Self Exploration	547 views	276 users
TDI, Articulate	1384 views	321 users
Type Dynamics Personality Indicator Self Exploration	419 views	219 users
1.2 Your Skills		
Skills Every College Student Has	17238 views	512 users
Discipline Specific Technical Skills	173 views	81 users
Project Samples of Different Disciplines for CV's	19 views	11 users
Skills Employers Seek Handout	3 views	1 user
Skillz	17157 views	511 users
SWOT Diagram	17273 views	512 users
Career Development Plan	4571 views	216 users
Industry Analysis Reflection	252 views	130 users
Your Career Action Plan1	54 views	27 users
2.1 Finding the Job		
The Recruitment Process Handout	65 views	49 users
Review The Job Descriptions	17027 views	512 users
Job Description Folder	299 views	124 users
Job Description Matching Activity	335 views	44 users
2.2 Apply for the Job		
GMIT – Interviews – 5 Easy Steps	81 views	45 users
CV Best Practice	3 views	2 users
Example CVs	219 views	123 users
Cover Letters	226 views	127 users
About Yourself 1	17030 views	508 users
Sample Editable CV	81 views	59 users
CareerSet – Student Guide	72 views	48 users
My Pitch	81 views	45 users
Build your CV	230 views	41 users
Upload your Completed Cover Letter, CV and Job Description	5800 views	193 users
2.3 Get The Job		
Informational Interview Handout	118 views	73 users
Subject Related Questions	108 views	72 users
Startz	69 views	45 users
Successful Video Interviews Introduction	25 views	17 users
Mock Online Interview	1940 views	158 users
3.1 Careers Network		
GMIT Networking before LinkedIn	28 views	16 users
Here's an example of the perfect LinkedIn profile summary (or so says Harvard!)	39 views	25 users
LinkedIn Help Online	31 views	22 users
3.2 Life in the Workplace		
Workplace Quiz	17065 views	508 users
Professionalism – Skills, Techniques and Behaviours for Career Success	62 views	40 users

Figure 4: Student Activity Report

4.5 Stakeholder Involvement

Both graduates and employers contributed to the course content and shared their experiences of navigating the employment market. Recent graduates were highly impressive in presenting their careers to date and the break-out sessions with students from the various disciplines were highly engaging. This blended learning experience, consolidated the learning, supported learning preferences and was assisted with bespoke online resources. *Academic staff* got to participate in elements of the learning outcomes, and the online module acted as an additional accredited module to go towards the students work placement credits. *Employers* got to inform students about their companies, the sector, graduate programmes and opportunities, their recruitment process, and skills they look for in students. Table 2 includes the various samples of testimonials received from stakeholders.

Table 2: Stakeholder Comments

GMIT Employer Testimonials	
"We recently participated in an online Employer Speed Networking Session organised by the GMIT Careers Service. The students were extremely engaged and showed a genuine interest in learning about Regeneron, our culture and our work to bring life changing medicines to patients around the world. It was a great opportunity to connect with students, learn about their interests and build awareness of careers in biotech. We look forward to participating in more GMIT speed networking sessions and meeting more potential future employees."	Sr Talent Acquisition Specialist, Regeneron
"It was a pleasure to take part in the online Employer Speed Networking Session organised by the GMIT Careers Service. The session involved 3rd year Chemical and Pharmaceutical and Forensic Science Students. It was a great opportunity to meet and assess students and I found them to be well prepared, enthusiastic, and had researched our organisation well. The session was extremely well organised and carried out to a high professional standard, allowing both myself and the students ample time to carry out an interactive learning session.	Garda, Divisional Scenes of Crime
"Another Medtronic colleague and I took part in the GMIT Employer Speed Networking event organised by the GMIT Careers Office. We both were extremely impressed by the way the session was organised, it ran very smoothly ensuring each of us got time to inform the students about our company and departments while also ensuring adequate time for the students to ask questions to gain a deeper understanding of the company and what we do. The break-out rooms worked like clockwork and we all got equal time to make our impression on the GMIT students who were very interested and inquisitive from the start. We since received some LinkedIn connections from the students and some very positive feedback about our pitch which we were very happy about".	Talent Acquisition Co-ordinator Medtronic
Academic Testimonials	
Covid-19 caused the Business Information System (BIS) programme to work more closely with Bridie in the Careers Office. It has proved to be a silver lining in difficult times. We collaborated with the Careers Service to deliver the Online Next Step Employability Careers module to 3rd year BIS students as an alternative to Work Placement. This partnership yielded positive outcomes for students, in terms of CV and Interview preparation, job sector analysis and identifying their key strengths and skills. As the BIS student work placement co-ordinator, I can attest that students have benefited both in terms of self-knowledge and in preparation for the future graduate recruitment process. Thanks for all your help.	Senior Lecturer / School of Business
The Career Module has given a new dimension to the work placement experience, so we have decided to integrate it permanently.	Head of Department for Mechanical & Industrial Engineering
The experience was so positive for our students that the module is going to be permanently integrated into our placement module.	Work Placement Coordinator BEng (Hons) Software & Electronic Eng
"In 2021 , the Galway International Hotel School collaborated & partnered with the Careers Service to deliver the innovative 5 credit Online Next Step Employability Careers Module to 87 students across 10 programmes whose placements had been postponed as a result of the pandemic. The module was delivered in a blended approach with the supervision and facilitation of an allocated lecturer from the Galway International Hotel School, and this included a comprehensive schedule of weekly workshops and one-on-one sessions with the students. As a result of the success of delivery, and the positive engagement of the students on this module; Progamme Boards are now planning to incorporate the module into future programme design, thus enhancing preparation for work placement, and for graduate preparation."	Head of Dept Galway International Hotel School
"The Next Step provided students with an array of opportunities to avail of expertly guided reflections as well as practical enhancement of career building skills".	Lecturer Galway International Hotel School
Alumni Testimonials	
" As a graduate of GMIT's Engineering programme, it was great to be given the opportunity to talk to current students (3rd Year BioMed) about my work and the career path I have taken since completing Mechanical Engineering, Level 8 in 2018. I feel honoured for this opportunity and through the initiative shown by Dr Carine Gachon and Bridie Killoran this was made possible. I feel it was a good opportunity for the 3rd year students who unfortunately were unable to complete their work placement due to the current situation. Hopefully it gave them and insight into the work we do in the Medical Device Sector each day to improve the lives of patients. Thank you for this opportunity and it's nice to be able to give back something to a college that gave me so much during my studies".	R&D Engineer Merit Medical Galway
"I thoroughly enjoyed participating in The Next Step Online Employability Module, sharing my academic and career experiences with GMIT's 3rd Year Chemical and Pharmaceutical and Forensic Science students. Undergraduate students often undergo difficulties when deciding future careers choices and I was delighted to be granted the opportunity to be of help and provide useful advice for the students."	Graduate BSc (Hons) Chemical & Pharmaceutical Science

4.6 Student key takeaways

The design of the module was very practical in that many of the student outputs could be used in the recruitment and selection process. The students produced a personal career development plan which included their strengths profile, personality type , emotional intelligence report, personal SWOT analysis, skills audit, and an industry sector profile, CV and covering letter to match a real job description. Students participated in online employability workshops, assessment centres and learned from graduates and industry about their relevant employment sector and job opportunities.They developed a professional online professional presence using digital technologies and honed advanced skills for work aimed to develop their own employability journey. A key component of the CV application process was a 30-minute one-to-one consultation and they were provided with bespoke email communication which highlighted relevant placement opportunities and support available from the Employability and Careers Hub.

4.7 Student Feedback

Overall the feedback from the students was very positive; The webinars were rated highly along with the CV review workshops. They particularly enjoyed the practical elements that were useful for them in the recruitment process.

- 80% of the student's survey rated the module excellent, very good or good
- 82% of the students reporting enhanced self confidence
- 80% reported finding the online virtual mock interview excellent, very good or good
- 74% of students reported they found the mock interview feedback excellent, very good or good

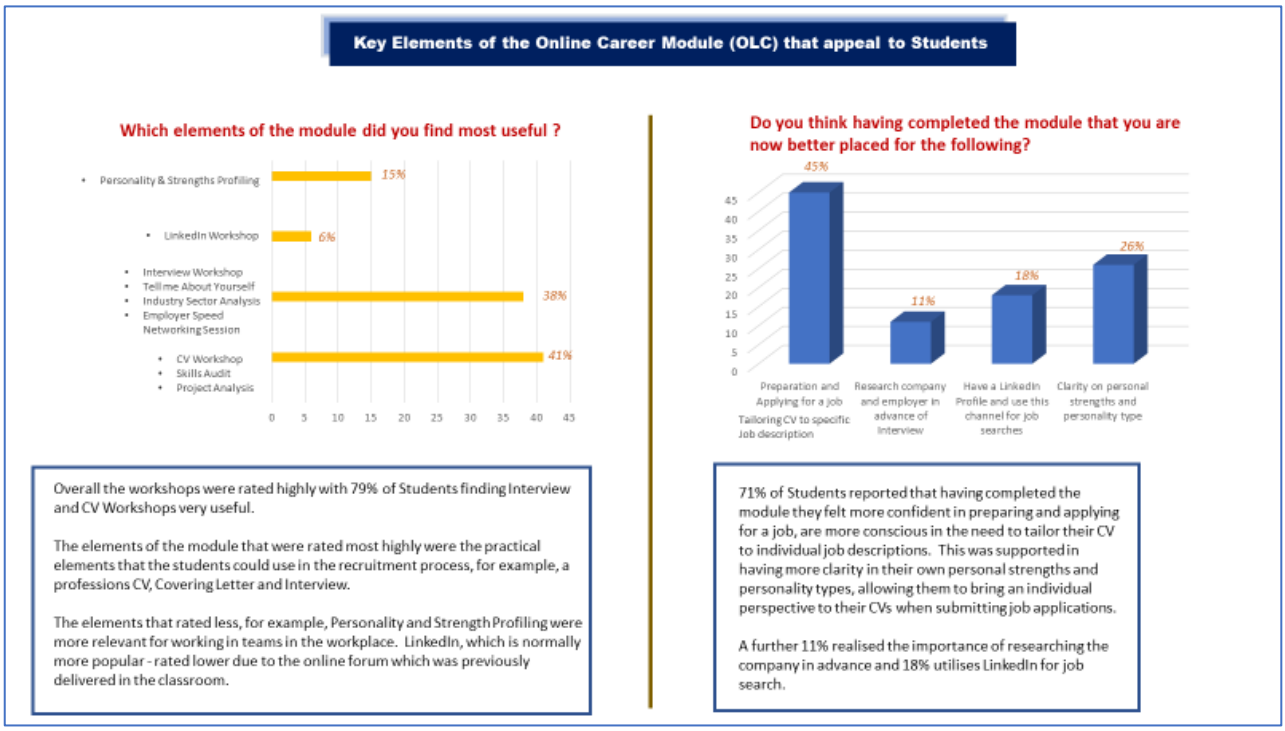

Figure 6: Example of Student Feedback Survey

4.8 Assessment Strategy

The module consists of two continuous assessments. Students are required to complete two assessments:

- 20% Career Development Plan (Consisting of personality and strength's profile and technical and transferable skills audit, personal SWOT and Industry sector analysis)
- 80% Portfolio (Consisting of CV, cover letter, video mock interview, elevator pitch and online quiz)

Opportunities for peer and self-assessment are integrated. Lecturers may choose to use either of the two assessments as an integrated assessment with other modules, such as a Work Placement module or a Communications module. The assessments include an oral element, as the online interview is included.

4.9 Delivery

The module is made available to students as a five credit, graded module (pass/fail) or as a tool for self-development. Students who enrol for the five- credit module benefit from a combination of individual online learning and live online workshops. The main topics covered are (in order):

-Your Strengths

-Your Skills

-Finding the Job

-Apply for the Job

-Get the Job

-Careers Network

-Life in the Workplace

The module delivery is student focused. The learner has flexibility and choice with the availability of blended and online learning engagement opportunities. It implements peer learning opportunities; creative and innovative challenges and the Moodle page includes access to national and international employers.

The delivery focuses on collaborative and active learning strategies. Students appreciate the distinct practical focus. The assessments require reflection and encourage analytical and critical thinking skills along with engagement in the latest technology using Artificial Intelligence. The module encourages students to use the knowledge they have gained about themselves to guide their career development.

The variety of tools and technology used to deliver the module, along with the use of iconography, ensures that the module complies with elements of Universal design for Learning:

- Enhanced teaching of the Careers module offering multiple means of engagement, representation, and action
- Students were engaged with personal reflective activities, were more confident and celebrated their strengths with positive encouragement from their peers, produced remarkable outputs (more informative, professional and with individual creativity, were less threatened doing personal career tasks as they had a choice to engage with varied technologies. Students from different

backgrounds and nationalities engaged more with the task as they were given guidelines for completion.

- Multiple means of engagement- Students can attend live lectures and workshops or learn in their own time at their own pace using the finely designed Moodle page. Students can email the lecturer or Career Services with questions. The Moodle page contains written information, links, and quizzes.
- Multiple means of representation- The information is available for students to access using an array of methods.
- Multiple means of action/ expression- Students will have written and aural tasks. They can choose to take optional psychometric tests to gain an even deeper understanding of themselves.

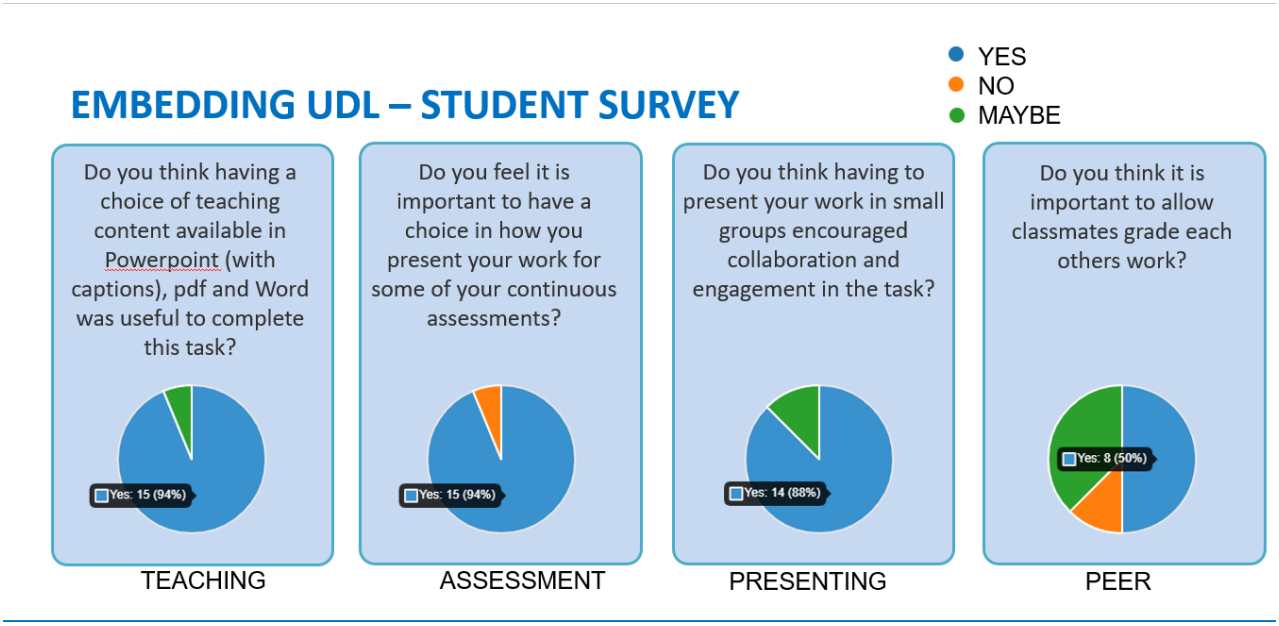

Figure 7: The impact of embedding UDL on the student experience of the module

4.10 Professional Practice

The module is entirely focused upon student's professional practice. It can equip students with skills prior to embarking upon work placement, and it can consolidate the student's learning after having experienced work placement.

Opportunities for formal reflection (as part of the Career Development Plan) and informal reflection (in class discussion) are integral to the module.

Students benefit from developing their self-confidence and enhancing their awareness of emotional intelligence, which in turn informs their professional practice.

4.11 Internationalisation

International students can avail of the opportunities offered by The Next Step as part of their career development, and non- international students can benefit from class discussions with those students who may have had different experiences as part of their previous education. Many GMIT students develop international

careers and exposure to future professionals from other parts of the world can provide valuable opportunities to learn from one another and to network in a safe, beneficial atmosphere.

International resources are utilized within the module, such as the Psychometric assessments. Several of the Psychometric tools are available in a choice of languages.

Students were encouraged during live discussions to consider diverse cultural perspectives, such how job titles, duties and working hours vary amongst cultures. Students will be encouraged and advised upon working effectively with diverse groups. External professional bodies and industry partners, including those from international organisations, will be invited to present to the students.

4.12 Education for Sustainability

The institute's careers module has been designed to be delivered to programmes across the institute to give direction on embedding employability within the curricula.

This will have an impact on all students' long term and sustainable employability as they embark on their career journeys. Elements of the module are designed to instill self confidence in the students, as they are coached in how to reflect positively upon their skills, strengths, and experience.

4.13 Gender Equality, Diversity, and Inclusion

Content within the module includes the importance of gender equality, diversity, and inclusion (within the "Life in the Workplace").

4.15 Employability

The module has been expressly developed to enhance career opportunities. The Virtual Learning Environment (Moodle) is supported by Career Services, who constantly post links to jobs, employment news, job opportunities, current industry developments and graduate opportunities. A major emphasis of the module is for students to value their transferable skills. Students explore, analyse, check, and identify gaps within their skill set and have opportunities to process those skills into a career development plan. Students are required to reflect upon their educational experiences at GMIT and to emphasise the value of the knowledge and skills that they have gained in their career plan and portfolio. Students take Psychometric assessments, which help them to recognise entrepreneurship abilities within themselves. They are encouraged to reflect upon their time at GMIT in a positive manner, to draw value from the lessons and experiences they have undertaken during their studies and extra-curricular activities. Students will be able to identify opportunities by researching current developments in their chosen industries. Students will network with one another in small online group workshops. Students will gather resources and connections through online networking, while engaged with current platforms such as LinkedIn.

4.16 Stakeholders

Guest speakers from industry have been invited to speak to students. The involvement of stakeholders with different backgrounds and from different disciplines was invigorating and staff training by the Careers Service helped build the delivery team. The contribution of graduates and employers added hugely to the student's experience.

4.17 Technology Enhanced Learning

A Learning Technologist has developed the Moodle page and the result is accessible, user friendly and visually appealing. Students benefit from the varied sources of information and varied delivery methods.

5. Conclusions

Student employability is a major theme at national, sectoral and Institute level. It could be argued that the strong tradition of GMIT in this area pre-dates the development of the range of polices. However, it is important to place employability in context, use the language of employability and embed elements of the framework into programmes to make it more obvious and accessible to all stakeholders.

The key to the success for embedding an employability programme, such as ***The GMIT Careers Module-Transition to Work,*** into the curriculum is the support from senior management and collaboration from the teaching and learning department and the academic departments. There is still not universal agreement from the academic community in relation to the placing of employability initiatives within the curriculum. However, we have seen an increase in support from the academic community looking to engage students with the concept of employability early on in their courses. If a system is in place to allow students to articulate and record their career goals, which can lead to action planning and reflection, this will inevitably have an impact on student's self-confidence with underpins the CareerEdge model of sustainable employability.

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Employing the use of tablet PCs in instruction and partly automatizing the assessment process of online university courses during the COVID era

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Abstract
In this paper, we present distance-learning and assessment methods for engineering courses. The primary content of engineering courses involves mathematical equations, but there is an increasing need for drawing figures and tables on the spot, as well as demonstrating theory-in-practice using multimedia. In the present design, synchronous handwriting with a digital pen on pre-prepared slides presented on tablet-PCs was utilized in lectures via a videoconference platform in real-time, attempting to simulate the use of a blackboard while teaching in a physical classroom. The lectures are video-recorded and delivered to students, along with the annotated slides, for further study. Furthermore, a substantial delay in textbook delivery was introduced due to the pandemic that lead the authors to compile personal notes in PDF form to assist students in their study. Regarding course assessment, open book examination is adopted, with internet access allowed to all participants, while the assessment is invigilated via a videoconference platform. In addition, an automatic procedure is developed so that each student electronically receives a unique exam sheet, thus addressing the issue of academic dishonesty in online assessment pertaining wide student audiences. This is achieved by (a) randomizing the order of the exam questions using specific software, (b) including student serial number into the numerical data of each exam sheet, and (c) introducing a small variation in some of the exam questions. Advantages and disadvantages of the present distance-learning approach are discussed and statistics collected via online questionnaires are presented, suggesting that students show strong preference to the current course design over others, even over teaching in the physical classroom.

Keywords: online learning, distance learning technologies, learning assessment, engineering courses, tablet PCs

1. Introduction

Due to the COVID-19 pandemic higher education institutions around the globe had to suddenly shift from face-to-face instruction to online course delivery and assessment. This transformation proved quite challenging as numerous considerations had to be addressed, among which insufficient technological knowledge and skills on the part of both learners and educators, connectivity issues, lack of training in

distance learning for educators, modifying materials and methods to ensure learning and engagement, and remodeling assessment to safeguard academic integrity (e.g., Gamage, Silva, & Gunawardhana, N., 2020; Golladay, Prybutok & Huff, 2000; Neuwirth, Jović, Mukherji, 2020; Paudel, 2021; U.S. Department of Education, 2010). Although online education had been around for decades, the "emergency" remote teaching (Hodges, Moore, Lockee & Bond 2020) that had to be adopted impromptu by the majority of institutions due to the pandemic has been documented as "disruptive, aggressive, disastruous and unwelcome" (Iglesias-Pradas et al. 2021, Watermeyer et al. 2021, Wyatt-Smith et al. 2021 as cited in Rapanta, Botturi, Goodyear, Guardia & Koole, 2021, p. 717). Challenges were even greater when lecturing online for large audiences, that is classes with more than 60 students (Elison-Bowers, Sand, Barlow & Wing, 2011), as learner retention rate is bound to drop due to lack of interaction and less personalised communication (Bawa, 2016).

Engineering courses, with a lot of mathematical content that needs to be explained, are predominately delivered via lecturing (Apkarian, Henderson, Stains, Raker, Johnson & Dancy, 2021), either using the blackboard or through presentation slides. Although the blackboard is ideal for the gradual and paced presentation of complex concepts, it does not allow for the presentation of intricate images that are often required in such courses, while the opposite stands for slide presentation (Bauer, 2019). Assessment is vital in monitoring student performance and ensuring that learning objectives have been achieved. In engineering courses summative assessment is very often implemented, and feedback, if any, provided to students is not deemed satisfactory (Subheesh & Sethy, 2018). Incorporating a formative component with constructive feedback comments has been suggested in order to improve assessment practice (McDowell, White & Davis, 2004). However, final examination still carries a lot of weight in most engineering courses and protection of academic honesty during online exams has been a major concern in institutions world-wide (Brown, 2018; Harper, Bretag, & Rundle, 2021). In Greece, this lead to the postponement of final examinations in many institutions (Kiouvrekis, Kokkinaki & Andrikopoulos, 2021).

In this paper we present a teaching and assessment practice followed in three engineering courses, namely *Physics for Engineers*, *Signals & Systems*, and *Digital Signal Processing,* at the Department of Computer Science, University of Crete, Greece, during the pandemic. This practice is a fusion of methods already established for these courses in the pre-Covid19 era, and of new approaches that complement or enhance student-instructor interaction and student engagement, while trying to guarantee academic integrity in examinations during the pandemic. All courses adopt (i) a lecturing and (ii) an assessment scheme appropriately conformed to distance learning. The former employs the use of prepared PPT slides enhanced by real-time handwriting on a stylus-equipped tablet PC, while the lecture is recorded live and delivered to students. The latter is a three-fold procedure consisting of (a) in-class assessments that strengthen student engagement, (b) weekly or bi-weekly assignment sheets that test students' engineering knowledge while improving student confidence by practising self-correction skills, and (c) midterm and final examinations that are designed to deter cheating behaviour via an automatic procedure producing unique exam sheets.

The present paper is organized as follows: Section 2 presents the teaching and assessment of engineering courses before and during the pandemic, highlighting similarities and differences. Section 3 presents the course delivery and assessment methods during the pandemic with greater detail, Section 4 evinces the effectiveness of the proposed methods using student evaluations and finally, Section 5 concludes the paper discussing limitations and future steps.

2. Teaching and Assessment of Engineering Courses before and during the COVID-19 pandemic

For the authors, the utilization of stylus-equipped tablet PCs during lecturing did not emanate from the pandemic. The second author introduced this teaching practice in 2007, for two courses (Signals & Systems, Digital Signal Processing), and adopted by the first author (for Physics for Engineers) in 2015. This means that the pandemic did not significantly change the delivery method of the three courses. However, the lack of physical interaction with the audience led to a series of steps that were taken to further support and enhance distance learning. First, the number of remote assisting lectures provided by teaching assistants (TAs) was increased during the pandemic, as students might have more questions compared to in-person teaching and learning. An assisting lecture – delivered using the same stylus-equipped tablets – was fixed once per week for the whole semester and the content of the lecture was also recorded and uploaded on the course webpage. Second, remote office hours were increased both in length and in frequency to support personal interaction. Although a teleconference platform was used for communication, all students were strongly encouraged to turn their cameras on, relax, and ask any question without hesitation. Third, an in-class assessment named Grading Opportunity (GOP) was introduced to encourage student attendance and participation. GOPs are given to students whenever they (orally) answer correctly non-trivial, in-classs questions. A GOP corresponds to an extra 0.05 on the student's overall course grade – no more than 10 GOPs are allowed per student. In general, GOPs should be low enough to discourage grade-grubbing but also high enough to motivate students to put some thinking into the non-trivial questions posed by the instructors and participate in class discussions. Finally, a set of detailed lecture notes in digital form for each course was compiled (more than 250 pages each) to deal with COVID-related belated delivery of preselected textbooks.

For the assessment, the authors strived to maintain a pre-Covid19 strategy consisting of (a) frequent assignment sheets, (b) a midterm examination, and (c) a final examination, in an attempt to employ formative assessment. An assignment sheet consisted of several theoretical and practical problems, each with its own correct answer given as a hint. This way students could check their own results and rationale and reformulate a solution, attaining a higher level of confidence as the need of self-correction appeared less and less often. Answer sheets were submitted electronically via dedicated software. Moreover, in engineering, knowing formulas by heart is not crucial in problem solving. Thus, exams, either midterm or final, followed an open book policy while internet access was sometimes allowed, well before the appearance of SARS-Cov2. Undoubtedly, systematic invigilation is required to ensure academic integrity with the former being remotely applied using teleconference platforms. In an attempt to keep this assessment structure, significant modifications had to be made to the exam sheets to further reduce or even minimize academic cheating. We chose to adopt a specific open-source Latex-based software called MUCH (Kolountzakis, 2006) to create randomized, different, but with

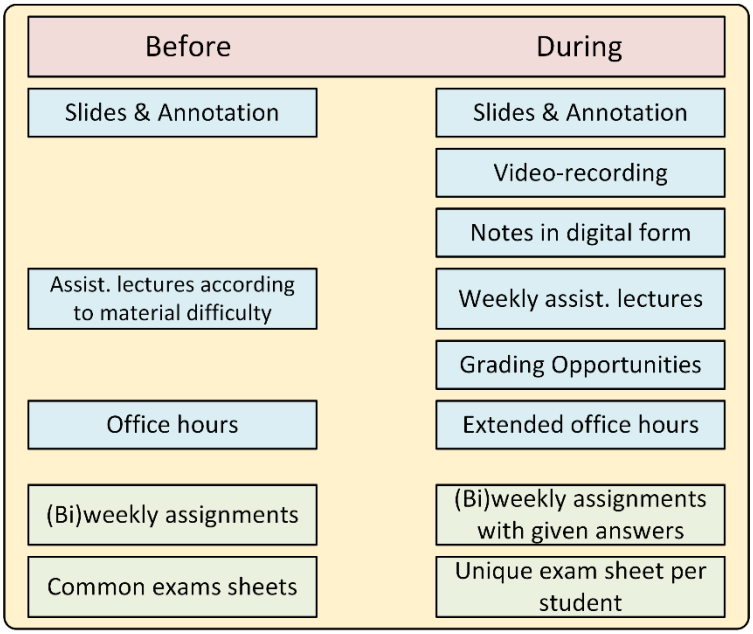


Figure 1: Teaching (in blue font) and assessment (in green font) practice before and during the pandemic.

equal difficulty, exam sheets. The software supports both multiple-choice and essay questions. Figure 1 shows the teaching and assessment practice before and after the pandemic. In what follows, we describe the basic parts of these practices in greater detail.

3. Proposed Teaching and Assessment Practice

3.1 Teaching: Using Tablet-PCs during lecturing

Utilisation of prepared slides in engineering courses is a common practice in both virtual and in-class learning (Bauer, 2019). Advantages of such an approach, among others, include

a) providing students a concrete, error-free, up-to-date material for each lecture,
b) saving valuable instructional time by having figures, schematics, or diagrams drawn beforehand
c) increasing time for questions and discussion over writing on the board or note keeping,
d) adding multimedia (videos, images, audio) to assist explanation of hard-to-grasp concepts or to demonstrate practical applications of theory, and
e) maintaining eye-contact, thus promoting communication with large audiences, since slide content can easily change with a press of a button.

However, several disadvantages have been reported, such as (a) cognitive fatigue due to passive reading and listening, (b) limited information present on slides to keep slide content short, and (c) insufficient description of complex concepts in the form of listed items or a series of bullets rather than as a concrete thought process. It would be beneficial to keep most of the advantages and minimize or eliminate the disadvantages of prepared slide-based material.

Figure 2: Common tablet PCs (older model on the left, modern model on the right).

To this direction, we propose using stylus-equipped tablet PCs for assisting material delivering. Compared to other similar technologies (such as USB-based digitizers), the instructor can actually write on the tablet's screen and can see, correct, and enhance his/her handwriting. Moreover, since a tablet PC has all the benefits of a laptop computer, the instructor can record and share the material, can stream it over the internet, can access webpages and fora, can directly use a keyboard or a mouse if needed, can connect to a variety of external devices (such as projectors, loudspeakers, and laser pointers) with ease, and can use other software in conjunction to improve the delivery of the material. Handwriting on slides alleviates cognitive fatigue, since students can engage into learning, problem solving, or into detailed handwritten explanations. In addition, prepared slide information can be kept minimal while details can be written down during the lecture, and finally, complex concepts can be analytically explained, thus helping students comprehend the underlying thought process. Screen and audio recording helps students reproduce in-class environment any time, ask for clarifications via e-mails, and strengthen material comprehension over multiple replays of the content. It should be noted that tablet PCs are far more expensive compared to their digitizer counterparts

but also significantly more convenient to use. Refurbished or second-hand hardware that significantly reduce costs can also be used. In Figure 2, two common stylus-equipped tablet PCs are shown (a second-hand, cheaper, and older model on the left and a modern model on the right) and in Figure 3 we present an

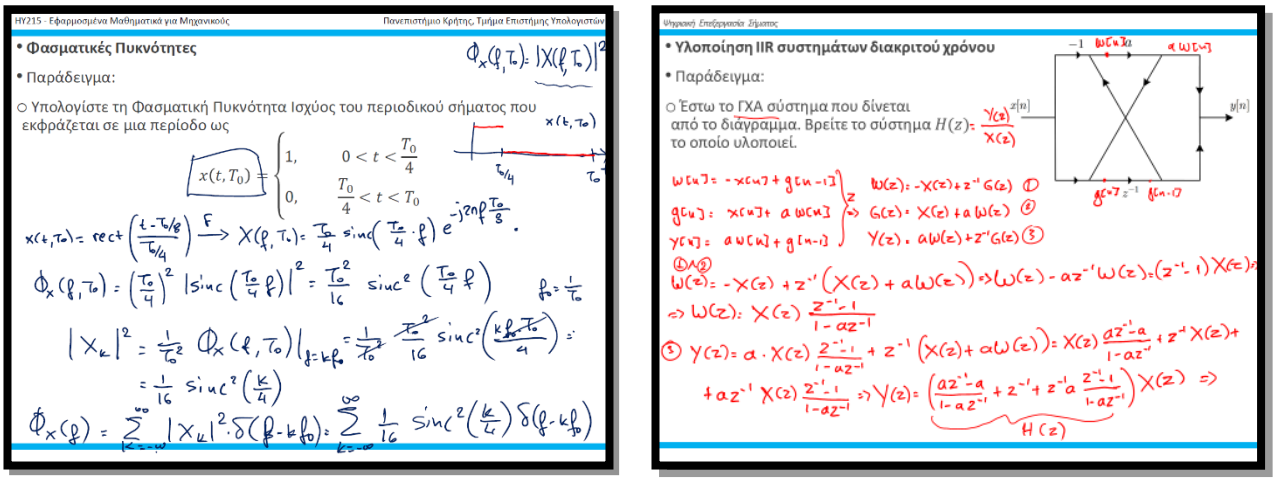


Figure 3: An example of two slides with their handwritten notes.

example of two slides (in Greek) with their handwritten notes.

3.2 Assessment: Modifying midterm and final examinations

In engineering courses, it is important for students to present their thought process in problem solving. Pre-COVID course assessment was based on assignment and exam sheets containing a mixture of standard and novel engineering problems. We deemed that the assignment sheets did not require any modifications during the pandemic; hence only midterm and final examination amendments are discussed here. One way for the instructor to check the student's thought process is to perform an oral examination immediately after a written or an online exam. However, in courses with a very large audience (more than 300 enrolled students), this is not feasible. Furthermore, distance learning platforms offer online examination options in the form of multiple choice questions, code writing or completion, or text input. This could be a convenient way of assessment in a variety of university courses but in engineering courses, a significant amount of mathematics is required to efficiently describe a pathway to problem solution. Unfortunately, math typing in a computer requires some experience – which most undergraduate students do not have – and is time consuming, while at the same time it is not fully supported by most online learning platforms.

For these reasons, we decided to adopt a remote examination scheme as similar as possible to a pre-COVID examination, adjusted to maximize academic integrity. In such previous examinations, all three courses had an open book exam policy, that is, anything that could be written or printed on paper was allowed during the exam (books, notes, and slides). Moreover, when the number of students attending the exam was small (which is the case for the *Digital Signal Processing* course), laptops and internet access were also allowed but communication between students or third parties was strictly forbidden and moderated via invigilators.

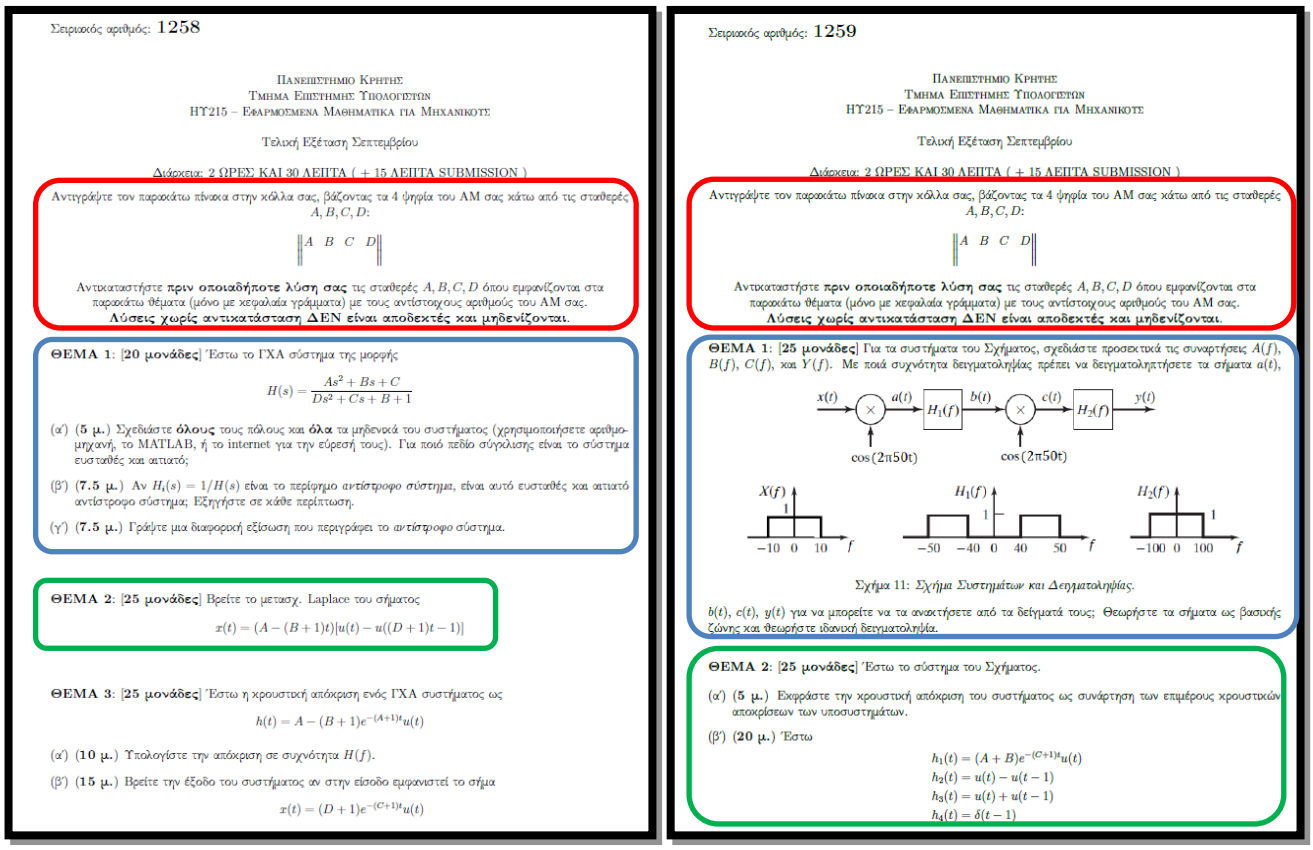
For remote examination, students are obliged to connect to a videoconference platform using their personal computers, turn on their microphones and cameras, enter a specified virtual room, and adjust their desk in a specific layout to optimize invigilation. Then, each student electronically receives a unique copy of his/her exam sheet at the specified date and time of the examination. To ensure examination transparency, the following measures are applied on the exam sheets:

a) the exam questions are randomized using specific software,
b) student institutional serial number is included into the numerical data of each exam sheet, and
c) a small variation in some of the exam questions is introduced.

More specifically, we use an open-source software named MUCH (Kolountzakis, 2006) to create unique exam sheets for each student. MUCH was originally designed to generate and automatically grade any number of randomized, *multiple choice* examination sheets. However, its use can be extended to any type of question. The sheets are randomly generated according to some specifications from a database of questions. These questions should be provided by the instructor in TeX format. MUCH creates a file in TeX which – when compiled – contains all exam sheets in a single PDF file that can be successively split into individual sheets.

Randomizing the order of exam questions in an inherent property of MUCH and requires no effort from the instructor – however, a significant amount of time and effort is required to create the database of questions. In order to both reduce time and maximize inviolability, we decided to include the digits of the students' serial number into the numerical data of each exam sheet. This way, not only each question is in a different place in almost every pair of exam sheets, but also the numerical data of similar questions can be vastly different – and the same applies to their answers. Finally, variation is introduced in a small number of questions via a change of sign in an equation, a different operator (e.g. a square instead of a square root), or a different order of operations.

Figure 4 illustrates two different exam sheets for the core course *Signals & Systems*, as provided by MUCH. In



Σειριακός αριθμός: 1258

ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΥΠΟΛΟΓΙΣΤΩΝ
ΗΥ215 – ΕΦΑΡΜΟΣΜΕΝΑ ΜΑΘΗΜΑΤΙΚΑ ΓΙΑ ΜΗΧΑΝΙΚΟΥΣ

Τελική Εξέταση Σεπτεμβρίου

Διάρκεια: 2 ΩΡΕΣ ΚΑΙ 30 ΛΕΠΤΑ (+ 15 ΛΕΠΤΑ SUBMISSION)

Αντιγράψτε τον παρακάτω πίνακα στην κόλλα σας, βάζοντας τα 4 ψηφία του ΑΜ σας κάτω από τις σταθερές A, B, C, D:

$$\begin{Vmatrix} A & B & C & D \end{Vmatrix}$$

Αντικαταστήστε **πριν οποιαδήποτε λύση σας** τις σταθερές A, B, C, D όπου εμφανίζονται στα παρακάτω θέματα (μόνο με κεφαλαία γράμματα) με τους αντίστοιχους αριθμούς του ΑΜ σας.
Λύσεις χωρίς αντικατάσταση ΔΕΝ είναι αποδεκτές και μηδενίζονται.

ΘΕΜΑ 1: [20 μονάδες] Έστω το ΓΧΑ σύστημα της μορφής

$$H(s) = \frac{As^2 + Bs + C}{Ds^2 + Cs + B + 1}$$

(α') **(5 μ.)** Σχεδιάστε **όλους** τους πόλους και **όλα** τα μηδενικά του συστήματος (χρησιμοποιήστε αριθμομηχανή, το MATLAB, ή το internet για την εύρεσή τους). Για ποιό πεδίο σύγκλισης είναι το σύστημα ευσταθές και αιτιατό;

(β') **(7.5 μ.)** Αν $H_1(s) = 1/H(s)$ είναι το περίφημο *αντίστροφο σύστημα*, είναι αυτό ευσταθές και αιτιατό αντίστροφο σύστημα; Εξηγήστε σε κάθε περίπτωση.

(γ') **(7.5 μ.)** Γράψτε μια διαφορική εξίσωση που περιγράφει το *αντίστροφο* σύστημα.

ΘΕΜΑ 2: [25 μονάδες] Βρείτε το μετασχ. Laplace του σήματος

$$x(t) = (A - (B+1)t)[u(t) - u((D+1)t - 1)]$$

ΘΕΜΑ 3: [25 μονάδες] Έστω η κρουστική απόκριση ενός ΓΧΑ συστήματος ως

$$h(t) = A - (B+1)e^{-(A+1)t}u(t)$$

(α') **(10 μ.)** Υπολογίστε την απόκριση σε συχνότητα $H(f)$.

(β') **(15 μ.)** Βρείτε την έξοδο του συστήματος αν στην είσοδο εμφανιστεί το σήμα

$$x(t) = (D+1)e^{-(C+1)t}u(t)$$

Σειριακός αριθμός: 1259

ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΥΠΟΛΟΓΙΣΤΩΝ
ΗΥ215 – ΕΦΑΡΜΟΣΜΕΝΑ ΜΑΘΗΜΑΤΙΚΑ ΓΙΑ ΜΗΧΑΝΙΚΟΥΣ

Τελική Εξέταση Σεπτεμβρίου

Διάρκεια: 2 ΩΡΕΣ ΚΑΙ 30 ΛΕΠΤΑ (+ 15 ΛΕΠΤΑ SUBMISSION)

Αντιγράψτε τον παρακάτω πίνακα στην κόλλα σας, βάζοντας τα 4 ψηφία του ΑΜ σας κάτω από τις σταθερές A, B, C, D:

$$\begin{Vmatrix} A & B & C & D \end{Vmatrix}$$

Αντικαταστήστε **πριν οποιαδήποτε λύση σας** τις σταθερές A, B, C, D όπου εμφανίζονται στα παρακάτω θέματα (μόνο με κεφαλαία γράμματα) με τους αντίστοιχους αριθμούς του ΑΜ σας.
Λύσεις χωρίς αντικατάσταση ΔΕΝ είναι αποδεκτές και μηδενίζονται.

ΘΕΜΑ 1: [25 μονάδες] Για τα συστήματα του Σχήματος, σχεδιάστε προσεκτικά τις συναρτήσεις $A(f)$, $B(f)$, $C(f)$, και $Y(f)$. Με ποιά συχνότητα δειγματοληψίας πρέπει να δειγματοληπτήσετε τα σήματα $a(t)$, $b(t)$, $c(t)$, $y(t)$ για να μπορείτε να τα ανακτήσετε από τα δείγματά τους; Θεωρήστε τα σήματα ως βασικής ζώνης και θεωρήστε ιδανική δειγματοληψία.

Σχήμα 11: *Σχήμα Συστημάτων και Δειγματοληψίας.*

ΘΕΜΑ 2: [25 μονάδες] Έστω το σύστημα του Σχήματος.

(α') **(5 μ.)** Εκφράστε την κρουστική απόκριση του συστήματος ως συνάρτηση των επιμέρους κρουστικών αποκρίσεων των υποσυστημάτων.

(β') **(20 μ.)** Έστω

$$h_1(t) = (A+B)e^{-(C+1)t}u(t)$$
$$h_2(t) = u(t) - u(t-1)$$
$$h_3(t) = u(t) + u(t-1)$$
$$h_4(t) = \delta(t-1)$$

Figure 2: Two different exam sheets as provided by MUCH software.

red boxes, students are asked to copy a small numeric table (A, B, C, D) with their institutional serial number in every page of their answer sheet. This is a common piece of information in all exam sheets. In blue boxes,

we highlight Question 1. It can be observed that it is different for both sheets and randomly selected by MUCH. Finally, in green boxes, we highlight Question 2 which is, again, different in both sheets and it contains data that depend on the digits, A, B, C, and D, of each student's institutional serial number.

After receiving their copy, students have time to write their answers in a template answer sheet. Teaching assistants (TAs) invigilate students (one TA per 10-15 students, at most) via their cameras and take notes of anything that might seem to be a violation of the exam policy. The students are explicitly asked to explain and write down their thought process as clearly as possible, and then submit their answer sheet in any common format (PDF, PNG, JPG, or DOC) either by e-mail or by uploading it to a dedicated server. Submission time is usually ten to fifteen minutes and is added to the scheduled examination time.

It should be stressed that despite the benefits of such an online examination scheme, there are certain disadvantages. First, as already mentioned, a considerable amount of time and effort is necessary to create the database of questions, although including student-specific information in each question can significantly alleviate the situation. Second, a large number of invigilators is required for courses with high attendance. Third, the instructor has to grade N different papers, one for each of N students. This leads to a remarkably increased workload compared to a common exam sheet for all students and probably is the major disadvantage of the proposed method. Finally, MUCH is a command-line-based software, without a graphical user interface (GUI), and requires some level of experience and some working knowledge of TeX.

4. Student Evaluations

At the end of each semester, students are asked to evaluate all courses via an online, anonymous questionnaire compiled by the Quality Assurance Unit (MO.DI.P) of the University of Crete. Filling in the questionnaire is non mandatory but students are strongly encouraged by both the department and the instructors to submit an evaluation. However, the questionnaires are sent in the third quarter of each semester and the platform closes about three to four weeks before the exam period, thus students are not given the opportunity to evaluate course assessment via remote examination. Furthermore, official questionnaires are often too generic and do not deal with the details and peculiarities of each and every course. As instructors, we wish to receive student feedback that covers all aspects of each course curriculum, including final examination.

To achieve the above objective, we have compiled custom questionnaires for each course using Google Forms. Anonymity is guaranteed via Google's platform and students are requested to i) answer multiple choice questions, allowing justification for their selections, and ii) provide their opinions and thoughts in free text. The latter is considered to be the most important part of the evaluation. In this paper we present statistical outputs from both questionnaires, with the official one containing feedback for the teaching part only and the customized one providing valuable information for the entire course (teaching and assessment). Since the courses we teach usually have different audiences both in size and in background as well as different placement in the department's curriculum, student feedback is presented per course in the following subsections. We present statistics on four questions regarding course assessment and teaching approach. The first question refers to the evaluation of assessment and the next three questions to the teaching:

a) What is your opinion of the course assessment?
b) How would you evaluate the teaching approach (use of tablet PC)?
c) Would you prefer tablet-based or whiteboard-based teaching?
d) How would you evaluate the quality of the material (slides + handwriting)?

In total, more than 300 students participated in the official and customized questionnaires.

4.1. Physics for Engineers

Physics for Engineers is a 1st year elective course that accounts for 8 ECTS. However, the department strongly suggests first-year undergraduates to attend this course over others. Hence, its audience ranges from 300 to

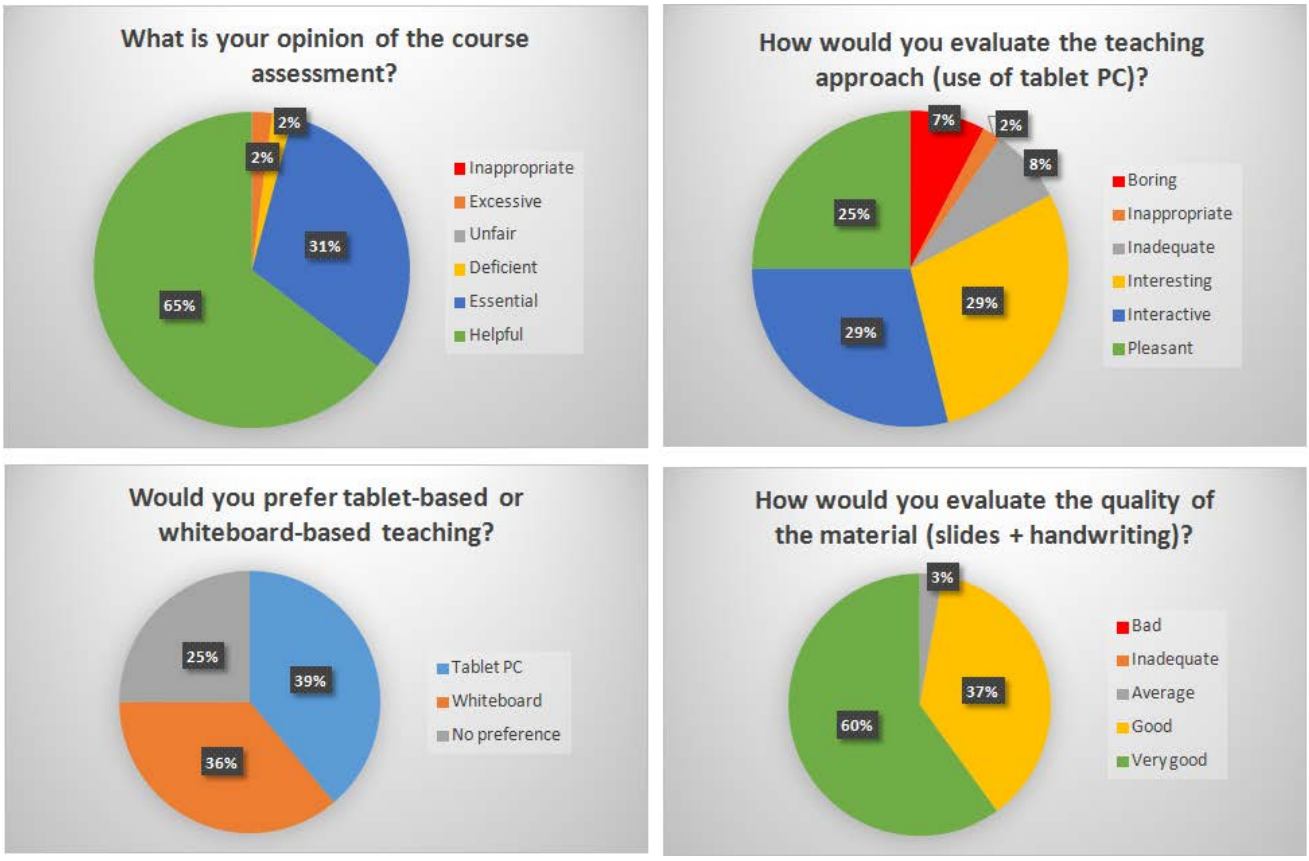


Figure 3: Student feedback for Physics for Engineers.

450 enrolled students per semester. This course has been remotely taught only once, in winter semester 2020-2021 with an audience of 430 enrolled students. Figure 5 presents the students' opinion on teaching and course assessment.

The following observations can be made: 96% of the students consider that course assessment is "essential" or "helpful". Similarly, 83% of students think very positively about the use of the tablet PC, suggesting that this approach is "interesting", "interactive", or "pleasant". However, it is interesting to note that only 39% prefer tablet-based teaching over 36% of whiteboard teaching. This may be justified by the fact that 1st year undergraduates come from high schools that promote whiteboard teaching of Physics instead of a more technologically-driven approach. Finally, 97% of the audience thinks that the annotated material quality is either "good" or "very good".

4.2. Signals & Systems

Signals & Systems is a 2nd year core course that accounts for 8 ECTS. Hence, its audience ranges from 200 to 400 enrolled students per semester. This course has been remotely taught twice, in spring semester, 2019-2020 and in winter semester, 2020-2021. Figure 6 depicts student feedback from both semesters.

It is interesting to note the differences and similarities compared to first-year undergraduates that attended Physics for Engineers. Again, students view course assessment as “essential” or “helpful” at a rate of 90%. Similarly, they regard our tablet-based teaching approach as “interesting”, “interactive”, or “pleasant” at a rate of 96%. However, their preference to tablet-based over whiteboard-based teaching is 74% in favor of the former. This stronger preference relative to 39% noted in Physics for Engineers can be explained by student acclimatizing since most courses in the department promote slides as a means of delivery. Finally, 85% of students think that the annotated slides are of either “good” or “very good” quality.

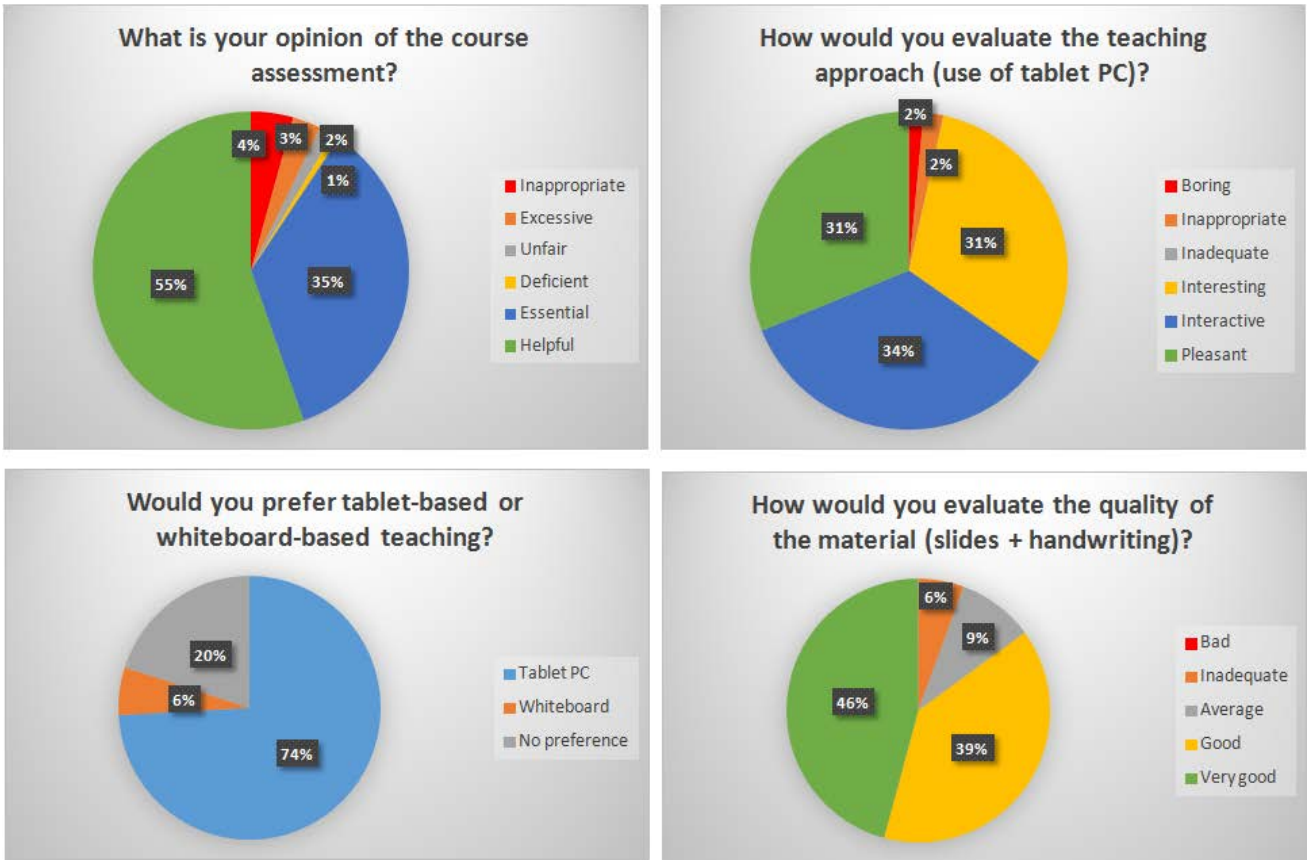


Figure 4: Student feedback for Signals & Systems.

4.3. Digital Signal Processing

Digital Signal Processing is a 3rd year elective course that accounts for 6 ECTS. Its audience ranges from 20 to 50 enrolled students per semester. This course has been remotely taught only once, in spring semester 2020-2021. Signals & Systems is a prerequisite course for Digital Signal Processing. This means that the audience of this course has already been exposed to our teaching and assessment methods in previous semesters. Figure 7 shows student replies to the aforementioned four questions.

From their feedback, it is evident that students are quite familiar with the teaching and assessment approach from previous similar courses and feel very comfortable with the proposed method of delivery. 89% of students consider that course assessment is “helpful” for students. Tablet-PC based teaching is considered “interesting”, “pleasant”, or “interactive” by all students (100%) while it is preferred over traditional whiteboard-based teaching by 76% of the audience – it is worth noting that no student explicitly preferred whiteboard-based delivery. Finally, the material provided to students is thought to be of “very good” or “good” quality by all students (100%).

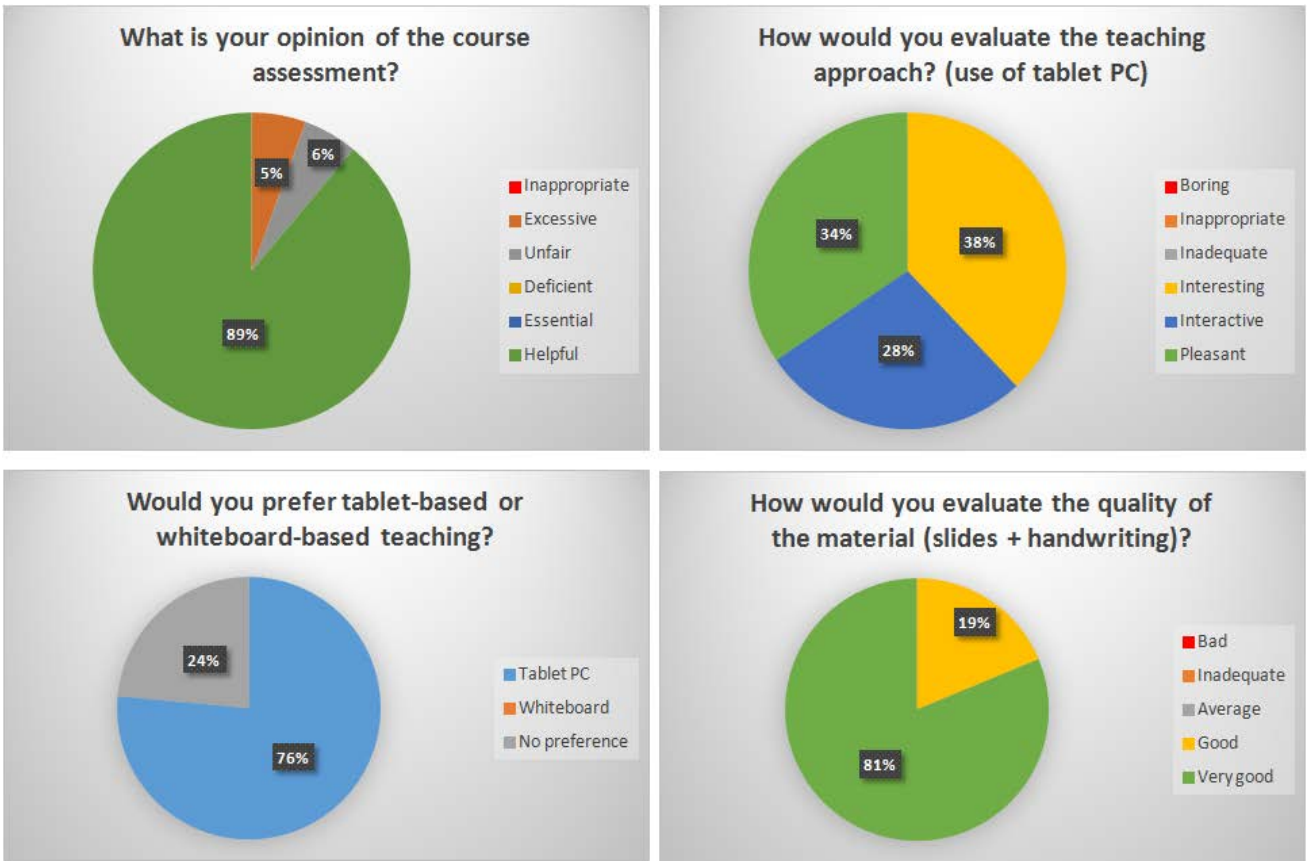


Figure 5: Student feedback for Digital Signal Processing.

5. Discussion

The COVID-19 pandemic caused a radical shift in both academic teaching and assessment. Digital learning platforms, online collaboration and teleconference applications became very popular and constituted the mainstream delivery method for the vast majority of university courses. While these methods can be well combined with lecture slides and instructor narration, they do not promote student engagement, they increase cognitive fatigue, and, as a result, slide content is oversimplified for the sake of time and effort. The situation becomes worse in courses that require a non-negligible amount of mathematical notation and/or a series of complex mathematical equations to model and solve real-world problems. We propose the alleviation of the aforementioned disadvantages by incorporating hand-written slide annotation via stylus-equipped tablet PCs during live online instruction which is video-recorded and made available to students offline. Application of this teaching method in three different, math-heavy courses was very much welcome by students according to their answers to both official and customized questionnaires, stating that this method is “interesting”, “interactive”, or “pleasant”. Actually, the majority of students prefer this method of delivery over traditional blackboard-based methods. Regarding assessment, course examinations can be extremely taxing if oral examination is selected in large audiences. Additionally, multiple choice exam sheets or math-free platforms cannot help instructors assess student comprehension. To this direction, we adopted an open-source software called MUCH, which can automatically generate a series of randomized exam sheets based on a database of questions. Combined with teleconference applications that allow invigilation, one can render a pre-COVID, open book examination environment feasible. Academic dishonesty is deterred by involving the students’ institutional serial numbers in the exam questions and by introducing small variability in specific questions. Students found this kind of assessment “helpful” and “essential”.

It is important to note that year of study seems to play a role in the degree of student satisfaction regarding live handwritten annotation on slides during remote instruction. This observation is further supported by student comments provided in open text format. A number of first-year undergraduates that attended Physics for Engineers noted that using slides and handwritten annotation "is very promising but it's something new, and *that* creates some difficulties", while others mentioned that "physical presence in class could be more beneficial". Furthermore, some students thought that "this technology is efficient but it is still very tiring to attend class". On the other hand, second- and third-year undergraduates that attended Signals & Systems and Digital Signal Processing correspondingly, seem to have a more positive opinion. Some of them noted that "solving problems in real time using the tablet is very smart and convenient", others said that "this is the perfect way to teach during this pandemic", and a few others stated that this teaching method is "exemplary". Hence, the need for face-to-face instruction and for a period of familiarization with this type of delivery seems more pronounced in first-year student evaluations. Regarding course assessment, almost all students acknowledged the instructors' efforts to ensure the integrity of the exam process. Few students noted that this assessment is "better by far compared to other courses which prefer multiple choice questions or short oral exams". High overall student satisfaction and integrity assurance regarding remote examinations conducted by the Hellenic Open University has also been reported in a large scale study (Liapis, Vorvilas, Korovesis, Aggelopoulou, Karousos & Efstathopoulos, 2021). In that study students comment that remote examination is less stressful due to environment familiarity and that their anxiety results mainly from fear of technical problems and limited exam time. Some of our students also highlight in their comments increased stress levels due to "knowing that someone is constantly watching through the camera", which also raises privacy issues (Chrysanthos, 2020; Bilen & Matros, 2021).

6. Limitations and Future Steps

In this paper, we discussed about teaching and assessment practices implemented in engineering courses of the Department of Computer Science at the University of Crete before and during the COVID-19 pandemic. Live handwritten slide annotation and lecture video-recording accessible to students is a practice we employed long before the pandemic, and which proved especially useful during the emergency remote teaching. Having already adopted this type of course material delivery, we felt better prepared to adapt to large audience online teaching and learning when the crisis broke out. Second- and third-year students were already familiar with the digital tools employed in lectures before the pandemic and welcomed them during the emergency remote teaching. Similarly, positive student attitudes towards the switching to remote teaching have been documented at the University of Patras; the authors note that the institution was "digitally-prepared" before the lockdown (Kamarianos, Adamopoulou, Lambropoulos & Stamelos, 2020). Of course, the use of digital tools alone is not sufficient to guarantee effective online learning. Transition to e-learning has to be based on the careful redesigning of the curriculum so as to ensure active learning (Rapanta et al., 2021). Active learning is key in STEM (science, technology, engineering and mathematics) courses at any level, including higher education (Freeman, Eddy, McDonough, Smith, Okoroafor, Jordt & Wenderoth, 2014). Active learning in STEM courses usually involves learning through activities, discussion in class and group work as opposed to a continuous exposition by the lecturer (Freeman et al., 2014). Socializing, communicating and cooperating were reported as elements mostly missing in online education of Greek universities (Raikou, Kaltsidis, Kedraka & Karalis, 2020), but also worldwide (Paudel, 2021). It must be underlined that the practice presented here refers to the exposition part of the lesson and other parts of course instruction such as activities and group work are not dealt with. Based on the experience gained by the instructors and the student teaching evaluations, we believe that the employment of the proposed tools -that is, live handwritten annotations on slides with the use of tablet PCs and video recordings of the lecture

audio and annotated slides, can help promote student learning and engagement in both face-to-face and online delivery of engineering course material. However, next steps should involve redesigning engineering course curricula to promote interactive e-learning. The questionnaire revealed a very high level of student satisfaction regarding online assessment. It is important that the majority of students felt that the assessment was fair and helpful. Also, automatically producing unique exam sheets for every student contributed to a certain extent to the safeguarding of academic integrity during final examination. To further improve assessment practice, feedback should play a more central role in formative assessment (Subheesh & Sethy, 2018), thus providing essential guidance and enhancing student learning.

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Engaging distance online students through active methods: the example of concept maps

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Abstract
Distance learning gained publicity and exposure with the pandemic context, attracting more students and the interest of research, consolidating its position of relevance, namely in higher education. This study seeks to reflect on the use of the conceptual map as an active learning strategy, with a view to greater student involvement in a distance university. From the context of a curricular unit with different strategies, which includes, in addition to the traditional reading of documents, the inclusion of videos and or activities in which each student participates in a committed way, it was proposed to use concept maps as powerful tools to engage students. This strategy was aligned with peer feedback. The testimonies left by the students who participated in this case study prove what the literature has said: that the active learning approach based on concept maps positively achieves the objectives and results that aim at successful learning and that the feedback from peers reinforces student self-regulation, enabling insights that improve their learning as a whole.

Keywords: Conceptual Maps, Active Learning, Distance Education, Higher Education

1. Introduction

In higher education, we know that student-centered learning requires the use, in a meaningful and self-regulated way, of the available learning resources, based on printed, digital, multimedia, or other information. Therefore, among the objectives to develop skills in these students are: to improve the way of dealing with information in multiple supports, train in the correct and ethical use of information in different contexts, and also make this learning work both in the context of the classroom or throughout life.

This study addresses the implementation of an active teaching method, in the Curricular Unit "Information Organization and Management" included in the study plan of the Master in Information Management and School Libraries, offered by Universidade Aberta, based in Lisbon. Teaching is entirely online, with students being taught at a distance. Preferred students are professionals qualified for teaching who intend to exercise coordination functions in school libraries and other professionals who intend to intervene and develop projects in the area of school libraries. Future information professionals and school librarians must be aware of the general principles and characteristics of information organization, description, and provision of access points to information, following international standards for cataloging, bibliographic description, indexing, and classification. Through this referencing and technical description, fundamental to efficient management of collections in libraries, it becomes possible to retrieve information at the time of research. Technical operations thus allow the fulfillment of a double objective: to give a rationale to the internal organization, adopting explicit rules for all who work in the description of information, and to provide effective means of localization, so that the documentation acquires a tangible value for its users, which manifests itself exactly through its possibility of recovery and use. The understanding of this value, together with the understanding of the evolutionary processes of library science and of the current methods of organization and document description, is the basis for the curricular purpose of this disciplinary area.

The teaching of these future professionals presupposes, on the part of the teacher, knowing the emerging pedagogical changes that can be used for the design of courses, integrating this knowledge in a more segmented, clear, and objective training offer (Sanches, 2018). This is intended to mirror a spectrum of skills, practices, and mental habits that broaden and deepen learning through engagement with the information ecosystem. The opportunity for reflective discovery of information, understanding of how information is produced and valued, as well as the use of information in the creation of new knowledge and ethical participation in learning communities (Association of College and Research Libraries, 2016) echoing students' experiences, must be provided.

This study aims to describe and explain a training activity that uses an active learning method - the concept map - in this subject area, analyzing and understanding how students adhered to this methodology in distance learning.

1.1 Pedagogical strategies and active methods

A recent study on the responsibility of teachers in pedagogical innovation underlines that achieving student-centered focus requires deliberate planning. Focusing on the role of teachers as creative professionals calls for a highly deliberate form of teaching that promotes student-centeredness and active participation (Paniagua & Istance, 2018, p. 18). A systematic review of meta-analyses (Hattie, 2015) which analyzed the impact of learning strategies on higher education students details 105 variables with a significant influence on student success. Student success achievement includes peer assessment, self-efficacy, preparation and organization, clarity and understanding, guidance for grades, and class attendance. Additionally, teacher behavior includes preparation, clarity, encouragement of discussion, availability, intellectual challenge, and the encouragement of independent thinking. Likewise, in another systematic review of meta-analyses about higher education students success, the authors (Schneider & Preckel, 2017) stated that achievement is strongly associated with the stimulation of meaningful learning by clearly presenting information, relating it to the students, and using conceptually demanding learning tasks; also, instructional method and how it is implemented in detail strongly affects achievement. The authors also underline that teachers with high-achieving students invest time and effort in designing the microstructure of their courses, establish clear learning goals, and employ feedback practices. Finally, they suggest that students with high achievement are characterized by high self-efficacy, high prior achievement and intelligence, conscientiousness, and the goal-directed use of learning strategies.

Thus, we can say that autonomy and self-efficacy, as well as self-directed learning and experiential learning, seem to be suitable strategies for different contexts, including distance learning. These strategies converge with the goals of active learning methodologies. “Active learning is an umbrella term that encompasses the many teaching methods that are student-centered and that engage students in some kind of activity and it is based on research documenting that people learn better when they are actively involved in an activity than when they passively receive knowledge” (Danver, 2016). Furthermore, active learning is also iterative, dialogical, and mostly collaborative; it is about the doing of understanding and, hence, about the application of knowledge in new and authentic situations (Christersson & Staaf, 2019). Several studies have advocated the introduction of active learning in learning strategies at all levels of education, including higher education. (Christersson & Staaf, 2019; Clarke, 2012; Meyers & Jones, 1993) and in various disciplinary areas (Beichner, 2014; Freeman et al., 2014; Langley & Guzey, 2014), affirming the purposes of knowledge co-creation through collaborative practices, conscious and focused on learning. A meta-analysis on the impact of active learning (Freeman et al., 2014) demonstrated that active learning leads to increases in exam performance, increasing average grades and that failure rates in traditional classes are 55% higher than those observed in active learning.

1.2 Conceptual Maps

There is already an understanding of how student-centered approaches, particularly active learning methods, benefit their learning, significantly improving understanding and retention of knowledge. Concept maps are one of these methods and can be a strategy to be considered in the teaching of information sciences, since the construction and reconstruction of knowledge in which the involvement of students is best achieved, involves the use of active learning strategies. Concept maps have been asserting themselves as important teaching tools that use metacognitive strategies, that is, they help individuals to learn about the nature and production of knowledge as they graphically illustrate a given subject, enabling a clearer observation of its structure, including the hierarchies of dependent concepts and other relationships between concepts, thus being an ideographic representation. In a seminal study (Novak, Gowin, & Johansen, 1983, p. 627) it is explained: "we see schematically the multidimensionality of cognitive structure organization which parallels the complex organizational potentials available in any area of knowledge". In other words, given the human being's innate ability to detect regularities and group them, concept maps seem to be appropriate to adapt well to any individual and discipline.

The advantage of these representations is the segmentation of knowledge, which implies a schematization and synthesis of a specific topic, facilitating the understanding, memorization, assimilation derived from the significant organization of this knowledge, which facilitates the entire cognitive process (Sanchez Cabaco, 2004). Taking into account the intrinsic characteristics of concept maps, namely hierarchy, selection, and visual impact, it is possible to understand their application as a learning strategy, namely taking into account the diagnostic objectives - understanding the relationship with the students' previous ideas; inclusion – what they consider relevant or accessory; of progressive differentiation – that is, how knowledge was reorganized; and integrative reconciliation - allowing the incorporation of new learning (Ontoria et al., 1994). Thus, teaching students to build, interpret and use concept maps can help them organize information about a subject, as well as make learning more meaningful, as it allows them to visualize how a given subject is organized and understood (Silva, Lopes, Catarino, & Payan-Carreira, 2019).

Working with concept maps can represent yet another path for teaching practices marked by authorship, autonomy, and co-responsibility, and by the advances and achievements in the path of learning, teaching, and training. Proposing new places for the teacher implies, among other challenges, the construction of knowledge that enables a critical, ethical performance committed to meaningful learning. Among this knowledge, some cover the didactic-pedagogical dimensions, reflecting, discussing, and proposing different perspectives for education (Ruiz-Moreno, Sonzogno, Batista, & Batista, 2007).

1.3 Teaching future teacher librarians with conceptual maps

The curricular unit "Information Organization and Management" addresses the technical issues of the document chain, that is, the entire path of the document, since it reaches a library until it is available for use and user request. These aspects relate to the organization and processing of documentation and information retrieval, with application to the context of school libraries. It also focuses on the importance of these areas in supporting and encouraging the effective use of documentation and the impact of technology in this domain. In terms of distance learning strategies for this curricular unit, before starting the subject, the working scheme for teaching is presented, explaining the general and specific objectives, as well as the evaluation criteria, expectations, and operating rules, clearly.

At an early stage, evaluation is also addressed. This should be able to demonstrate whether students understood the key concepts, analyzing the different resources available and whether they will know how to

apply given alternatives, managing to adapt their thinking to different practical cases. As it is a course entirely taught at a distance, teaching cannot use some traditional strategies, for example, based on synchronous interaction. Although a basis and a synthesis of the subject is provided, the deepening will have to count on the committed participation of each one and the discussion will be based very much on the students' participation and on what they can write and share, as well as on their out-of-school practice. Hence, it is important to make an intense connection between curriculum content and practice, through real cases and examples.

To allow a comprehensive and meaningful understanding of the matters, a global notion of the way information is presented is given, namely the type of formats that are subject to librarian treatment in which it manifests itself. It is also important to observe common points related to information in structurally similar systems and organizations, such as archives or museums, including examples and analogies and highlighting the differences and specificities in the field of librarianship and information and documentation science. There are already international regulations that point to new ways of describing documents, interconnecting, and researching them. Future professionals who will work in libraries will have to adapt to these new professional requirements and must be available for continuous training and future learning in new technical routines. On the other hand, integrated platforms that can manage various information resources in a virtual environment are increasingly a reality within your reach, a situation that should also deserve our best attention.

In the first approach, it is important to verify the understanding of the concepts in a transversal way, that is, to see if the students understand their practical applicability. It will also be important to do the opposite exercise, that is, to try to analyze examples that students can give, usually in their doubts or questions, which can be extracted and generalized, leading them to the presentation of the rule. With this type of activity, it is possible to improve the understanding of the whole, not confining ourselves to formats or technical specificities (although they have to be addressed), but to explain the concepts that occur based on these specificities. This anticipates that, in a real work context, the skills acquired can be applied transversally, even if the examples are different, the types of tools used are different, and the contexts, which are necessarily different, can take advantage of the constructed learning. It is in this context that the use of the conceptual map as a learning strategy seems pertinent.

Active learning methodologies, in particular the use of concept maps in the context of Library and Information Science teaching, are not completely new (Colosimo & Fitzgibbons, 2012; Normore & Garrett, 2007). The information sciences themselves recurrently use concept maps, lists, tables, and classifications to represent knowledge as a professional strategy (Åström, 2002; Estrada, 2009).

2. Methods

This paper presents a case study on the application of active learning methodology, based on the use of concept maps, for teaching information organization and management to future school librarians, within the scope of Library and Information Sciences. Case studies allow us to analyze concrete contemporary situations and to consider their contextual influences (Yin, 2009). Their main advantage is that they provide the analysis of reality, allowing reflection and decision-making about future perspectives.

The works and testimonies of students from the 2020/2021 academic year are considered. The Universidade Aberta is headquartered in Lisbon, Portugal, and provides online courses for the Portuguese and Portuguese-speaking population around the world. Being exclusively distance learning, there is an effective concern with the involvement of students. The class under study is composed of 10 students, of both sexes, from the first year of the master's course. In the curricular unit "Information Organization and Management" it is intended

that students get in contact with the main notions and concepts associated with Information Science, learn to treat and systematically manage information, organize information, and adequately support library users. Each thematic module begins with an introductory instructional video, which is supported by selected texts for reading. There is also an online discussion forum for students to ask questions. Finally, an evaluation activity follows.

The structure corresponding to the first module is presented below, which contains the exercise of concept maps.

Table 1: Curriculum contents and activities associated with module 1 – Introduction to concepts.

Contents and objectives	Information, knowledge, document, sources, standardization, document description, document chain, are current concepts in Information Science, but sometimes they are not properly clarified. In this first module, we will familiarize ourselves with the terminology applied, seeking to understand the processes and methods related to the organization and management of information. At the end of the module, students should be able to describe and explain, using the appropriate professional language, the processes, and procedures that involve technical document handling, from the arrival of the document to the library until it is available on the shelf for the loan. These processes are based on standardization. Standardizing is fundamental both for the production and management of bibliographic data and for its interoperability and sharing in the domain of libraries and beyond. This is what enables direct access to the document, providing research and information retrieval in multiple databases, catalogs, or repositories. The School Library, as a gateway to knowledge, must understand the information ecosystem in which it is located and the knowledge networks of which it is part, for its success, indispensable to the teaching-learning process and the educational/cultural policy.
Stages	1st phase - Main Concepts - Individual study of the materials provided - from March 5th to 15th. 2nd phase - Collaborative work (participation in the concepts forum) - from March 16th to 26th. 3rd phase - Involve students in the work of the school library - Individual study of the materials provided and consolidation of the study of materials from the previous phases - from April 5th to 12th. 4th phase – Reflection - Collaborative work (involving the student, sharing knowledge, retrieving information) – from April 13th to 19th.

The aim would be for students to read the texts independently and to record the main concepts so that they can then understand, with successive steps, how they are related. The main idea of applying a methodology in this disciplinary field has a goal of meta-learning: that they understand and incorporate the concepts in their learning, but also understand how they are related and how logical reasoning about these concepts can be done. This is because, in the case of information science, which includes theories, techniques, and systems for organizing libraries, it is important to assume that this matter is based above all on a practical understanding of the processes and mechanisms for organizing and processing information. Thus, concept maps are an interesting strategy to verify the learning of these subjects, because they encourage the visual explanation of their understanding, accommodate different learning styles, involve students with practical activities, and help to develop high-level skills, like critical thinking or problem solving, in a situated way. Thus, the following exercise was proposed:

Table 2: Proposed activity with conceptual map.

Activities	This is the forum you will use to present your work. It has an individual and a collaborative component. After viewing the introductory video to the theme and carefully reading the texts, they should create a concept map with the Gitmind tool https://gitmind.com/, GoConqr https://www.goconqr.com/pt-PT, or similar - save it in pdf and make it available here (until March 22). Then, they should comment on two concept maps of their peers, paying attention to differences found, strengths, and what could be improved. If a colleague already has two comments, they should choose another one to comment on (until March 26th)

This activity was designed to fulfill the following matters:

- Learning through understanding (which makes sense at each moment and in a contextually framed way)
- Underline the importance of understanding the concepts, structures, and functions associated with them, so that information transfer can occur, regardless of the situation
- Understand prior knowledge, as well as the learning needs at each moment, to adapt the contents, providing, while these needs are assessed, opportunities to put metacognition strategies into practice
- Provide opportunities for students to challenge their beliefs and habits, challenging their initial understanding of the subjects
- Seek that they are specialists, training planning, reasoning, argumentation, and exposition skills so that a deep

3. Results

In line with other works (Rutherford, 2012) a process for applying the methodology was designed, in which the following steps were developed:

- Students were asked to create a mind map of what they already know or remember about the concept or Information they are learning, mainly based on the selected readings;
- After the students have worked individually, they shared their work and observed other students build on what they recalled on their own;
- As a third step, students choose another map and worked to give peer feedback in the forum discussion;
- Finally, to complete the exercise, students reviewed the work of other students and note patterns and trends. The teacher also commented on the exercise and used the student-created work to point out significant information, to gather formative assessment data about to re-teach or extend.

Examples of the maps and related comments are given below.

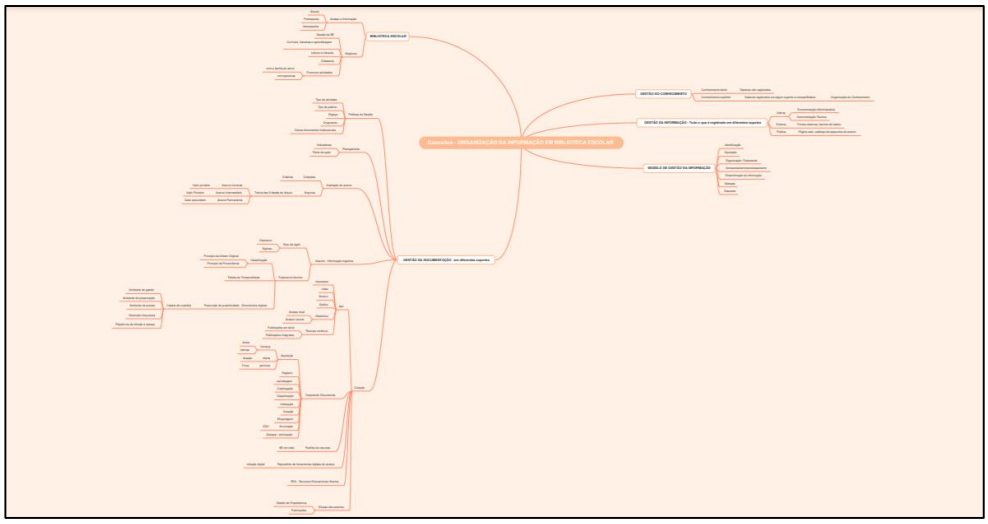

Figure 1: Conceptual Map from student 1.

Several students commented on this map:

Dear colleague R.,
first of all, I would like to thank you for sharing your concept map. I think it presents an interesting reading dynamic, also demonstrating a clear knowledge of the topics covered. The division of concepts into two axes structures the reading of the map, clarifying the concepts related to the organization of information in the library, which guides (the reader) to the literature indicated in this theme. Personally, to clarify the different levels of information I would have used more colors. Once again, thanks for sharing, and see you soon.

Good evening,
I'm glad we meet again, I've been looking at your map with all the care and attention it deserves and I really liked it. Naturally, you felt some difficulty because it was your first concept map, but in the next ones, you'll feel more at ease. The same thing happened to me initially, but as I had already done some Educational Research, now it was easier and funnier and they are addictive to do. The essential is present, from the management of documentation in its various branches and its different supports to the management of knowledge and information, as well as the various models of information management. I believe that your map contributes a lot to the general understanding of the subject and helps us a lot to understand this whole process with great technical precision. As less-well achieved aspects, I point out, similarly to what I also said in J.'s map, the explanation of one or another concept or the detail of one or another chain in the relationship of concepts with each other, but that, perhaps, is a matter for another job.
Thank you, I can only wish you good luck and a good period of Easter rest,

Dear R.,
I must say that I really enjoyed your Concept Map. It is quick to read due to its logic and clarity.
No relevant point was forgotten. Greetings.

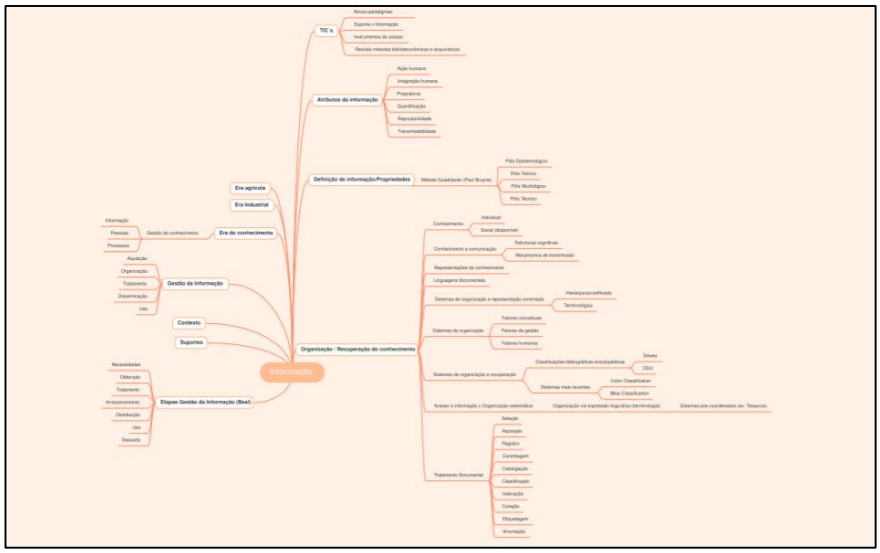

Figure 2: Conceptual Map from student 2.

Comments of other students on this map:

Colleague A., I liked the presented map.
Strong points:
The map presented was built based on the readings carried out and with emphasis on "Information", it manages to offer to understand and addresses the theme proposed for study.
It's a map:
· Informative;
· Addresses the documentation handling process;
· Addresses the Information Management Steps;
· Addresses Document Organization;
· Addresses Knowledge Retrieval;
· Addresses ICT's.
Weaknesses
In my opinion, the inclusion of the bibliographic reference would help a lot in the credibility of the concept map.
Best,

Dear colleague A.,
In my opinion, your map was good in terms of organization and structure. The interrelationships between the concepts were very clear and easy to read. I really liked the breadth given to the concepts of the theme concerning the texts provided. The only suggestion for improvement that I can observe is the addition of a bibliographical reference, in agreement with our colleague P.
Thanks for sharing your map.

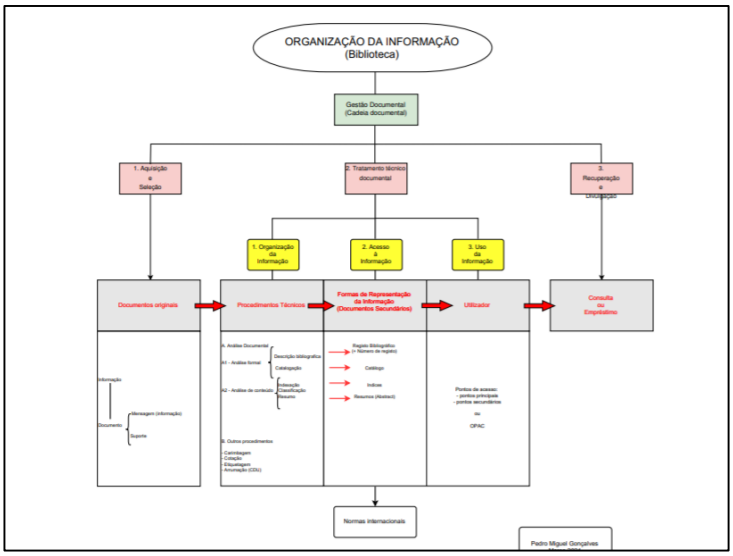

Figure 3: Conceptual Map from student 3.

Comments of other students on this map:

Good afternoon, P. and teacher!
Hope everything is alright. About the concept map, it is quite informative, pragmatic, it demonstrates the successive phases of the "document chain" and its interlinked relationships. I particularly like the classic style of that map.
In my opinion as a learner, perhaps to improve the dissemination of information, as it is one of the relevant and final objectives of document processing and, consequently, of a library.

Good afternoon dear P., teacher, and colleagues,
One of the most interesting points of this work has been being able to see the different ways in which we apprehend and visualize the same information; P.'s concept map is a great example of this, presenting the document chain in a way that would never occur to me. Like V., I also appreciated the classic style of the map and found it interesting how he presented the relationship between the concepts. However, I think that some relevant information is lacking, namely on the forms of acquisition and selection criteria. Furthermore, the order of document processing procedures is not clear, making it difficult to follow the process linearly.
Best,

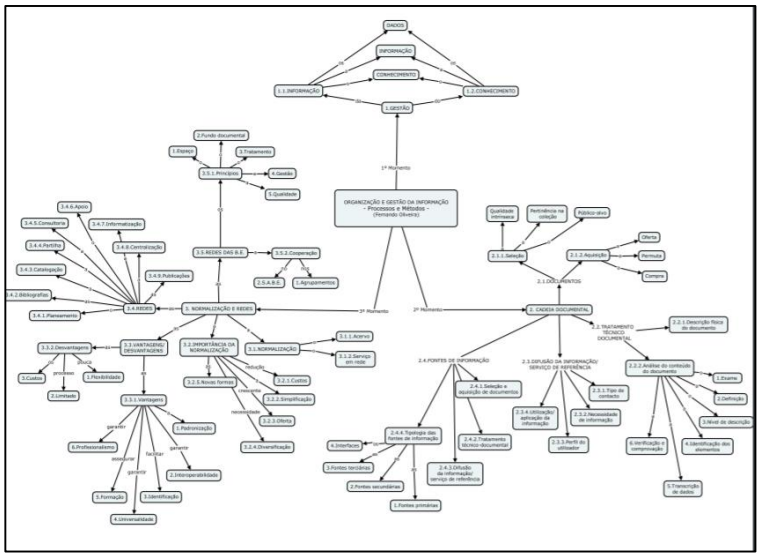

Figure 4: Conceptual Map from student 4.

Comments of other students on this map:

I must confess that I think F.'s Concept Map is very complete and spectacular. I think this map, as well as H.'s, are the best maps presented so far. With these maps, I feel that I am truly learning (as the information is organized) and it is noticeable that he has the baggage of other readings and experience. Congratulations!

STRONG POINTS
1 – This is a very elegant map that creates an effective way of globally viewing information.
2 – A very complete map, well thought out, well structured, which reveals a very systematic knowledge of the subject. So complete that it goes beyond, I believe, what was asked for.
IMPROVING
There are no relevant criticisms to point out, other than ridiculous details.
1 – The first phase of the Document Chain is "Acquisition and Selection", that's why in point 2.1. of your scheme, I would not write "Documents".
2 – I question the relevance of associating point 2.4. (Sources of Information) directly to the Documental Chain. It should perhaps be integrated into point 2.1.
3 – It is not possible to unveil a clear movement in this map, a circuit that reconstitutes the processes through which the flow of information passes through, as there seems to be no point of arrival. The traffic is lost, however, in the middle of the arrows, without getting anywhere. And I would say, with a literary twist: labyrinth addiction.

Good evening, P.
Thanks for your comment, it's extremely motivating. I'll improve the aspects you point out, this map was just the first sketch to try to understand the ins and outs of this CU. Concept maps are very important (and addictive to make) because they help us to systematize information, especially the most technical. They always helped me a lot in Educational Research, for example. Hugs, FO. [Answer of the author of the map]

Good evening, F.,
I agree: concept maps are addictive.
Formally, I would have placed the three titles of the themes (management/documental chain/standardization) in different colors, to highlight. I think that writing the 1st/2nd/3rd moment is unnecessary because you already put the number. But overall, you focused on three essential topics of this theme, the map is visually pleasing and very complete. I don't know if I wouldn't call point 3 just standardization, because the existence of networks stems from standardization. Without standardization of procedures, there could be no centralized cataloging services or common catalogs, for example. I agree with Pedro's observation. The stages of the document chain are identified and we must maintain the terminology. In addition to point 2.1., I would also amend point 2.3., calling it "information retrieval and dissemination". I think that the objective of technical-documentary processing is to facilitate the retrieval of information by the user. Maybe split the document chain into documents | phases. In the documents, I would put the sources of information. I would take points 2.4.1/2.4.2/2.4.3 from the sources of information (they refer to the steps in the document chain).

Good evening, H.
Thanks for your feedback, it's great that we learn from each other and have other perspectives that help us improve. Your observations are very assertive and I will follow the recommendations to balance the work more. I also thought about color differentiation to make it easier to read visually, but time has been a constant struggle that has led us to leave some important details behind. I'm still at that stage of the first look, the first reactions, trying to better understand the entire UC chain, which is not an easy task. Have a good weekend and a good Easter rest, FO. [Answer of the author of the map]

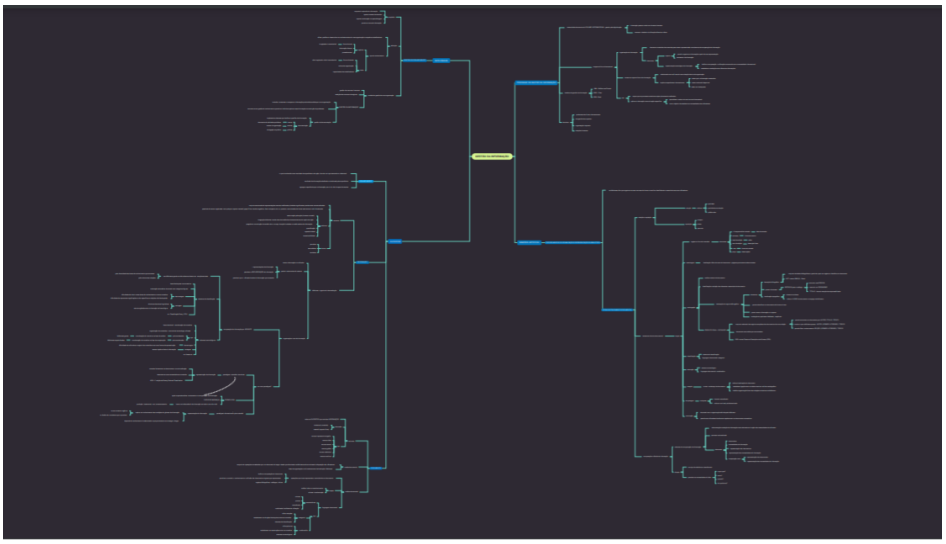

Figure 5: Conceptual Map from student 5.

Comments of other students on this map:

Good morning dear H., teacher and colleagues,
I have to start by congratulating H. for having the most complete concept map of the entire class; I think she managed to synthesize all the information from this first theme on her super map. I particularly liked the way she not only indicated the concepts but explained them, which makes the map a great study resource.

The only negative aspect I can point out is its size, which, despite being one of the elements that enrich the map, also makes it difficult to see. Any of the sub-themes that Helena presented (antechamber, processes, foundations, artificial memory) could be the main theme of a concept map, with a more direct and less confusing reading. Still, I kept the map in my course folder as a reference, so clearly, the dimension does not impede the consultation.
Best,

Good morning H. and colleagues
Not wanting to seem like an imitation, I echo the words of my colleague S., your map, in my view, is the most complete of the maps presented. My first reaction when looking at your map was of some dislike with its complexity and size, but when I started reading it, I ended up thinking that it could only be like that, the contents and procedures to be addressed are many, but you managed to systematize, the processes inherent to information management in a very fluid way. This map, by the way, synthesizes and explains each step, allows, as Sara says, the creation of "sub-maps" that can explain, separately, each of the different parts.
I wanted to congratulate you and ask permission to save this map in my files.
Thanks for sharing,

Good evening A. and S.,
Thanks for your comments. Yes, I also realized later that I had created four sub-maps that would work in isolation. I also realized that the map would be difficult to consult after turning it into a pdf. I even tried submitting it as an image because it would make browsing easier, but (strangely....) it was too heavy. As I made the map, I noticed the connections between the concepts. I still inserted some arrows, but I didn't insert them anymore because I thought it made the reading more complex. [Answer of the author of the map]

4. Discussion

Conceptual maps emerge as a technique that can be successfully applied to the disciplinary sphere in the information sciences improving motivation and engagement. It was found that the students perfectly matched the objectives of the proposed task. It is also verified that with concept maps, students become aware of their cognitive process since coding is one of the components of the learning strategies underlying this technique. In this case, it was intended to help students to learn significantly and explicitly, the nature and role of concepts and the relationships between concepts, as they exist either in their mental representation or as they theoretically understand them. Therefore, the representation of concepts and ideas and their cognitive representation were taken into account. Finally, the process of drawing up the maps, making them, and evaluating them by peers constituted a good participatory exercise, as mechanisms for the relationship between the task and learning were stimulated through the relationship between the learning of concepts and their explanation, and evaluation (Ontoria et al., 1994).

As a teacher, it was with great enthusiasm that I witnessed this task, carried out with great merit by all students, not only in the main aspect of reading, interpreting, and explaining the concepts, but above all in the interactions derived therefrom. The strategies used resulted positively, as the evaluation moment was used to give positive reinforcement feedback to the students. In this context, the strengths and weaknesses of the submitted works were highlighted, which are mainly based on the intersections of the subjects with the students' real-life experiences. This allowed for the personalization of learning and better memorization, but also the practical application of what is intended for them to know.

Resulting from the thematic forum activity, feedback from peers was requested as part of the exercise and this resulted very positively, generating more critical interactions between students. It was then a matter of creating a social presence, converted into an authentic learning community, which promoted the learning

experience (Garrison, Anderson, & Archer, 2015). Thus, cognitive presence, in which students can appreciate the work of their colleagues and at the same time assert their identity, is a strategy to be repeated.

Opportunities for feedback can be created at all times (Anderson, 2004) during learning in a virtual environment, reinforcing and underlining the main topics, but also checking to understand and valuing the ability to reason and think about new situations (in training moments), although the most critical moment to give this feedback, in a very personalized way, is the summative assessment (Nicol & MacFarlane-Dick, 2006).

In the case under analysis, it was found that the process of drawing up concept maps favored the organization of ideas and the emergence of relationships that were not initially evident, since the meanings are, to a large extent, personal, and the schematic representation of the map stimulates creativity in the new relationships that are established, allowing new levels of integration. In line with previous studies (Ruiz-Moreno et al., 2007), it became evident that the possibilities of schematization reside in the organization of the set of contents studied; also, most important conceptual aspects worked as a guide for new interconnections to emerge. At the same time, this work provided evidence regarding the involvement of students with the discipline, based on the meanings established between the concepts and the interaction between peers.

5. Conclusions

Using concept maps as an active learning strategy seems to make the learning experience more meaningful for the learner. In the collected testimonies, there was general satisfaction with the task of elaborating the maps and the resulting learning of concepts. As elicited in a previous study (Silva et al., 2019), also here, with this strategy, it was possible to relate knowledge and consolidate learning, improve problem-solving skills, facilitate the understanding of the indicated bibliography, benefit the individual and cooperative construction of knowledge, develop metacognitive processes and facilitate the study and general review of matters.

All maps, each in its style, had their merits, more than weaknesses, and showed above all that knowledge was consolidated in this introduction to the concepts of the Curricular Unit. The attentive observations, constructive and accurate comments, and encouragement to colleagues did not go unnoticed. I think we achieved a very interesting exercise with the committed participation of students. The main objectives are fulfilled. It is concluded that students are very receptive to using interactive methods in the question-answer strategy and other active learning strategies, as online peer interaction and feedback enhances participation. These interactive methods allow you to create a friendlier and more relaxed environment, in which students are not uncomfortable with making mistakes.

Studies like this, although specific, demonstrate how active methods are essential in distance learning. Concept maps, particularly, as a pedagogical strategy, prove to have merit in the teaching of library and information sciences.

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Blended Flipped Classroom and the conception of teaching to prevent drop outs

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Abstract

The submission addresses the question how students arrive successfully in the academic world in their first semester study by teaching academic writing skills within a blended flipped classroom concept. Skills in academic writing are necessary for social sciences. Without general knowledge in literature research, reading academic texts and the understanding of how to develop a scientific question, the study can fail by preparing the first term paper. The need for advice (consultation hours, email inquiries) in academic writing is very high especially in the first semesters. In order to consolidate the topic among the students and to provide profound self-learning material, I have planned, tested and evaluated a flipped classroom teaching-learning concept. The seminar uses OER (including a MOOC), and was running as blended and full-online course during pandemic times. The aims are: Increasing the media skills of students, promoting self-learning competences, interaction in the (online) seminar and providing learning material used throughout the study.

The workshop session presents the didactic concept, its challenges and the evaluation results. The main interest is to regard the teaching side and how to emphasize students' activities and self-learning. Online sources are indeed good tools and therefore the base, but without a fitting teaching concept the success is not that sustainable. In order to make the starting of a study successful and to prevent drop-outs, videos have to be combined by a self-reflection of the teachers roll. Based upon an empirical higher education research project in Germany, which examined the teaching conception including the experiences and beliefs of teachers (Kondratjuk/Schulze 2016), I present different types of teaching conceptions and will discuss how to develop flipped blended lessons in order to prevent drop outs in higher education.

Keywords: Flipped Teaching, Teaching conception, Active Learning, Higher Education, Dropout Prevention

1. Introduction

Based on the practice of a flipped classroom, this paper is intended to get in the mood for the workshop discussion. I will continue an open scientific discourse about teaching and learning at universities of Applied Sciences witch we started already with a communicative validation of research findings (Schulze/Kondratjuk 2017). The example is a seminar as part of the first semester in the Bachelor's degree in Social Work at a University of Applied Sciences in Eastern Germany. The seminar is presented methodically and didactically and regards the used material. The associated issues are explained and the role of the teacher emphasized. Based on the role of the teacher, references are made to the context of a university of Applied Sciences and the tasks of an introductory seminar. Then I present our theoretical model of teacher types and the functions of teaching in higher education in order to present the

relevant types for the described example. The paper ends with an outlook on upcoming research.

2. Basics of scientific work as flipped (blended) classroom

The course “Basics skills of scientific work” is one of the first seminar in the study of social work at my university. Social work is: “a practice-based profession and an academic discipline (…) underpinned by theories of social work, social sciences, humanities and indigenous knowledge, social work engages people and structures to address life challenges and enhance wellbeing” (IFSW 2014). The “Basics skills of scientific work” are therefore important during the study. Especially for students of social work who enter university with a very practical motivation to help others and very often with practical experiences in the social field. My students come with a subject-related high school diploma, specialist internships and completed trainings and quit a few of them are the first in their families to study. They are very motivated to finish the university in order to work in a certain professional field of social work later. The practice of social work is closer to my students than science and the discipline of social work. In general, an academic discourse is new to the first-year students and they try to find out what is the right knowledge is and take little part in discussions in seminars. Many believe that science is dry and boring. Thematic seminars that deal with family work, homelessness or disadvantaged children are slightly more interesting.

The task of the seminar “Basics skills of scientific work” must therefore arouse interest in scientific discourse, because the field of social work is shaped by paradoxes and requires a scientifically ground and critical reflective attitude (Brown/Rutter 2006). The issue is to get young people interested in science, theories and their critical reflection (Robbins/Chatterjee/Canda 1999). A flipped concept with videos is a possible way to gain these issues. From a teacher's perspective, a flipped classroom is a quit loosely and open concept. As an inverted concept it is turning the knowledge transfer in the self-organized preparation time before the students come together in the class to discuss and reflect there. It combines synchrony and asynchrony types of learning. Flipped teaching is “a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environement“ (FLN, 2014, S. 1). My teaching concept has three main components: 1. Compilation of the material and planning the seminar 2. Planning the attendance phases with individual and group tasks 3. Follow-up of the seminar and individual writing support. The seminar preparation includes a content-related timetable. For the basics of scientific work, these are: What is science and what it is used for? How to find a topic and asking questions at the beginning of scientific work? Material research and different types of texts, theoretical framework, methodical work, citation and the meaning of bibliography. For each content I am looking for open online resources like videos on the youtube platform. The videos are about 15 minutes and are examine in advance by me as a professor and my student assistants. The students also evaluate the videos after each course. They have the task of

watch the videos, reading the text and writing down questions about them before we meet in the seminar (virtual or analog). It is challenging in the organization of the flipped concept to define a) the issues of the seminar b) to choose the videos and texts input for the self-learning time and c) to contextualize the different inputs in the seminar issue.

When the students arrive in the seminar a group work is initiate to collect and focus the questions from the watched videos. I start the face-to-face seminar with an overview of the event and say where we are currently in the process. Then I divide the approximately 30 students into small groups of 5. The task of the 15-minute group work is to exchange ideas about the video and the questions you brought with you. The group work is a good method to start talking with each other. Because the students are in their first year of studying and don't know each other very well. To open up the discussion of the seminar content it is good way to initiate a discussion with each other and to activate the students. To open up a discussion strait away is always a bit hard unless a discursive culture of discussion is in the seminar group already established. The groups are encouraged to take notes. After the group discussion the plenum will be opened up to collect the focussed question around the video content. On a screen or the table, the questions are collected and then answered by the professor or within a discussion. The role of the professor is to give answers, examples and to lead the discussion. Therefore, he or she has no script. The point is to follow the questions of the students and to help to understand and not to repeat again the content. The learning in a flipped concept "is not just video" (Handke, 2015) it happens in the discussion and the individual answers by the professor. Some contents are provided with small tasks. For example, there is the task of researching various types of scientific text on a selected topic. These subtasks are briefly presented and discussed in small groups or in plenary sessions. On the end of the discussion, I summaries the discussion and settled it in the context of the seminar planning and the learning outcomes of the module. For example, how to research different types of literature is important in the academic writing process to define the scientific theme and the question. The seminar of academic writing is part of the module "Basics of Social Work" and combined with "History" and "Theories of Social Work". The teaching issues are based on conveying enthusiasm for the subject, adhering to quality standards, achieving common thinking and critical dialogue with the students and accompanying the development towards a full graduate. After the seminars in groups, I offer individual tutorials on how to prepare the first scientific paper.

This form of activating teaching requires specific teaching action. However, teaching at the university is integrated into certain contexts and has different goals. I will now show these on research I have done about teaching in higher education. Teaching at universities is a complex interplay of various factors and should be based on the experiences and approaches of teachers in the programmatic discussion about good teaching and a reduction in drop-outs and benefit from them. "A construct for the teaching concept that moves only in a normative discussion about 'good teaching' between teacher or content-oriented and student or learning-oriented concepts (Kemper 1997) falls short in our opinion" (Schulze et al. 2015, p.

169). Accordingly, the core of our research was the reconstruction of the teaching concept of teachers.

3. Teaching contexts in higher education

Teaching at universities is complex, has constantly assert itself alongside research, is currently more than ever in a university political discourse and is elementary. After all, it is about the implementation of educational processes at universities. But too many students drop out before they complete their higher education degree (Truszcynński 2013, p. 7).

Before the question will be addressed how a flipped concept can reduce drop outs a glance at the paradoxes of teaching in higher education is being undertaken. The following paradoxes are contexts of teaching and learning in higher education and the debate about the issues of studying at universities of Applied Sciences and universities.

- The contradiction between the diversity debate and equal treatment in academic teaching and the equality goal from a teacher perspective (diversity versus equal treatment)
- The goal of higher education teaching to support everybody and the function of selecting the best by testing in exams (selecting versus supporting)
- Competency-oriented teaching, in which the students as subjects are the focus and are thus to be supported in their personality development and the exclusive mass processing in overcrowded courses (individual versus mass)
- An educational entitlement in the practice of teaching is in part contrary to the endeavour to equip students with a scientific education and at the same time to fulfil the concept of employability (academic education versus employability)
- Teaching in higher education is characterized and limited by project forms, precariousness and administrative dependencies makes it difficult to build up sustainable educational processes (short projects versus long-term issues) (Kondratjuk/Schulze 2016, p.3)

Apart from these paradoxes there is an actual discussion about methods and didactic formats of teaching in order to prevent dropping outs from studies. The research findings about drop outs from higher education pointing out the following three theoretical key approaches to understand drop-outs:

- Student Assimilation addresses the students and their socialisation in the academic system, their adapting and fitting in the role of a student in higher education environment;
- Higher Education Transformation addresses the higher education policy and institutional practice to look after the student needs and includes curricula, cultural, social and physical environment;
- Socio-cultural Change focus on a wider level on society and the circumstances of higher education, “such factors as “class”, “race”, gender and disability which have an overarching function in shaping assumption and cultural messages about what types of educational opportunities are deemed suitable for different groups of students. These assumptions

shape both provision and the expectations of students themselves in multiple ways, some overt and some more subtle" (Quinn 2013, p. 70).

Five main strategies on an institutional level promote completion: (1) to talk and to clear expectations with students, (2) to deduce clear advices, (3) to provide a stable academic, personal and social support, (4) to involve students as valued members of the institution and (5) to develop settings that foster learning (Quinn 2013, p. 71f).

The idea of implementing a flipped teaching concept in one of the basic seminars in a Bachelor study program is therefore a very good access to address at least four of the five strategies. As a form of active learning, it is a possibility to negotiate expectations and to invite students as learners in the co-productive process of learning as individuals. The flipped classroom idea appears in the 90ies in order to create an alternative for the classical one-man or one-woman show at the university. Teaching ought to be less boring, more diversified and active and also including the new technical (audio-visual media) possibilities. The idea of participative learning and social effects of learning came to the fore. In many countries are now inverted classroom part of the teaching reality. But how does it work and which effects can be reached with an inverted concept, especially at the beginning of a Bachelor study program of social work at a University of Applied Sciences? The question is: What kind of teaching perception is needed to invite students in this flipped inverted concept?

The teaching perception has not yet been discussed in the discourse either as an empirical or as a theoretical context. Therefore, this paper will be the beginning of and scientific discussion in order to reflect the own teaching practice. First the theoretical frame of teaching perceptions in higher education from Schulze and Kondratjuk (2015) will be presented. Second a description of the flipped classroom concept in the course of academic writing - as an asynchronous form of knowledge transfer and application-related knowledge acquisition follows. Third the matching of teaching perception categories and the flipped classroom is checked. The aim is to promote the discussion about higher education didactic approaches not only from the perspective of the students, but also through the conception of teaching and the attitude of the teachers.

4. The model of teaching perception in higher education

To deal with the paradoxes in higher education institutions (between selecting and supporting students, between short projects and long-term goals, equal treatment and diversity, individual support and a mass of students, the different goals of scientific education and employability) teaching is a relational tool in order to bridge or to transfer knowledge between teacher and learner. For this reason, it is important to analyse the different categories of teaching perceptions in order to use them as qualities in certain contexts and for certain issues. As I mentioned elsewhere the components of teaching perceptions are:

1. Contexts of sense- and meaning within teaching in higher education
2. Conditions of teaching

a. The position of the teacher in the hierarchy of the university
b. The practice of teaching and the awareness of different levels of didactic planning

3. Types of teaching and the relation between the components (Kondratjuk/Schulze 2016)

4.1 Contexts of sense- and meaning within teaching in higher education

Teachers and Professors develop and use different contexts of meaning and explanations of their own teaching. These can be described in the following sub-categories.

Content and knowledge transfer – the idea of teaching as a content work is the main meaning. The own interests in the discipline or scientific approaches are the direction from where teaching is been thoughted. The goal is enthusiasm for science, the discipline, the subject.

Teaching as a duty – here teaching is just part of the job and necessary to be or to become a professor. There is not much attraction on being in the role of a teacher, it is exhausting and reputation comes not from students but from the scientific community.

Teaching as a performance – to demonstrate, to play the role of an entertainer to attract students as public for a certain subject is the focus of this category. The goals are enthusiasm, feedback and applause – to are successful with teaching.

Teaching as the fountain of youth – this category reflect time, the age of the teacher and the process of aging. Here teaching is often thoughted as a possibility to stay young while having an ear at the youth. This category reflects also the subjective meaning of tradition and modernity.

Teaching as a source of fun and joy – this means the pleasure of teaching as an interaction with people. Teacher and students come together to learn, discuss and to share time in order to develop personality and to enrich the discourse in the subject.

The picture of students – here it is important how students are described from the teacher. Are they motivated or lazy, interested or bored? Are students perceived as individuals with different needs or an uncoordinated quit homogenous mass? Here the one biographical experience of learning and teaching are reflected as well. Students can be seen as partner which are to activate or as a passive and silent circumstance.

4.2 The conditions of teaching in the higher education institution

The conditions of teaching are depending on the special position at the university system, the academic status and power (part-time, limited, teaching position versus full-time, unlimited professor) and how the evaluation and the critical feedback of the students are relevant for the status. The conditions of teaching are also the possibility to create learning spaces, the technical support, the library, the administrative support and in general the possibility to develop the teaching content, learning concepts and to test this with students.

4.3 Types of teaching in Higher Education

Types of teaching perception are based on the following comparative dimensions. These different characteristics are relevant for type-defining:

1. The perspective that a teacher has provide the content. This reflects the associated function of teaching and how this is successful or failing. The perspective refers to competence development, knowledge transfer or creating interest. The key is the perspective of how teaching relates to the subject matter.

2. The relationship between teachers and students as emotional educating or distanced knowledge transfer for example.

3. The attitude of the teacher versus the university operations and the position in the higher education system.

Types of teaching perceptions

The *content-oriented type* legitimizes itself as a university professor through the content of his subject. This type is enthusiastic about his subject, the goal of the teaching is arousing enthusiasm for the subject and passing it on of specialist content.

The *emotional type* seeks emotional closeness in the ranks of the students. This type makes friends, invests a lot of time in relationship work with the students and sometimes sees them as a kind of family substitute. His interest is in the development process of the student to accompany and to experience the "growing up".

The *educating type* sees his task in knowledge and transfer of skills using basic didactic principles. This type likes to reflect on his courses on what learning effects he achieved with the students. He maintains close contact to the students and supports their learning success.

The *dutiful type* sees teaching as a necessary evil, to be able to be a researcher. This type practices the contractually regulated teaching as a service and doesn't care about feedback. Teaching is an exercise and use as a test for an academic public.

The *entertainment type* perceives students as "audience". Teaching is an artistic performance. Success is measures in the amount of listener and their response. The role as a "speaker in front of many "is a pleasure and applause is a form of recognition. The aim of teaching is to inspire students for the scientific content through personal performance.

Teachers combine different types of teaching views in one Person. It can be assumed that this is adjusted at the immediate framework conditions, teaching formats, study programs. This makes it clear that higher education didactic offers possibilities to rise the quality of teaching. This is how teachers at university could create different accesses for different types of teaching and clarify their access to teaching. (My translation) (Kondratjuk/Schulze 2016, p.9).

These theoretical findings are now to be transferred to the question of how a successful start can be ensured. It can be assumed for a successful start at university, it is important to clarify the expectations and the basics of academic work. What do teachers at Universities of Applied Sciences expect from students and otherwise? An open, activating teaching concept creates the requirements for this negotiation process. In addition to the knowledge transfer, enthusiasm for the discipline and profession is essential. Therefore, the educational, content and also entertaining types are particularly suitable for an activating teaching concept such as the flipped classroom. The lecturers should not be precariously busy and engage with the students' questions.

The evaluation of my course shows that: students particularly praise the communicative and friendly atmosphere, the opportunities to exchange ideas in groups and the direct answering of their questions. Almost all students found the use of videos motivating. This would reduce the initial fear of doing something wrong and create a feeling of working together. Some statements were: “I particularly liked the interaction between you and us, as well as the independent preparation for the seminar with videos and the associated evaluation / discussion in the seminar”. They really liked it, that the seminar is designed individually according to the questions of the students. My students also had the following suggestions for improvement: “You could give us students more practical tasks that we do in the courses”. “I wanted more structure. The questions were mostly mixed up.” Some students would like to watch the videos together in the seminar so that they can ask their questions more directly. In Summary, the seminar “Basics of scientific work” with this format was rated as extremely instructive. But such a concept certainly does not make sense for every topic. For example, a different type of teaching is appropriate for lectures. In addition, the content of a course is an important aspect for the question of the “most effective” teaching type approach. For my course I can say, we have around 10% drop outs from around 90 students during the study.

5. Conclusions

In general, it is important to reflect on teaching types and how they fit specific teaching and learning objectives. Research on teaching is an element of development in Higher Education. Reflecting the types of teaching perception ideas of different teaching settings can guide to a validated matching. In this way, higher education can support an academically justified professional development. If I know what I am teaching and how and which teaching concept is appropriate for which subject and which format, then this transparency helps the didactic conception and lead the discussion about qualities of teaching to a more divers approach. A critical and scientifically based examination of practice and theory is particularly important in social work. This serves a critical professional development and scientific research in this field of activity. For my students, a committed and critical examination of knowledge and attitude in social work is an important prerequisite for mastering the course and then practicing this profession for a long time and satisfactorily.

It is also important for universities of applied sciences to position themselves relationally between theory and practice with a critically reflective teaching. In this way, these institutions of higher education can assume a trend function for the current issues of our time in the future. The Universities for Applied Sciences in particular, with their strong links to practical fields of action, force science and research to be contextualized on an ongoing basis. The core of applied teaching and research thus corresponds to that of Gibbons et al. (Gibbons 2000) form of modern knowledge called mode two.

Led me conclude with my vision for upcoming research projects. In addition to the permanent evaluation of my seminar for scientific work, I will ask students about their experiences with the seminar individually within qualitative interviews. It would be exciting to determine the types of learners and the function of teaching from a student perspective in order to work out commonalities between the various relationships of teaching and learning.

I am curious about your comments and experiences on the subject of teaching types and would be happy to hear from you about possible international research projects.

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Hybrid mediation and Digital Scholarship in Higher Education

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Abstract
The coronavirus crisis has challenged higher education institutions in many new and unexpected ways, particularly in relation to digitization and digitally enhanced learning and teaching (Perla, Scarinci, Amati 2021; Agrati, Vinci 2021). Mediation (Damiano 2013; Perla 2016; Agrati 2020) at the time of COVID-19 involved a strong accentuation of the dislocation of points of view with respect to interaction in the presence: technologies are 'amplifiers' of learning spaces and opportunities for learner-centered strategies, that can ensure greater accessibility of learning environments and resources (Huang 2020). The COVID-19 pandemic, which suddenly forced teachers to introduce hybrid models and practices in their teaching (Perla, Scarinci, Amati 2021), accelerated the process of raising awareness about the need for high quality professional development, for an advancement in the field of Digital Scholarship, for a support for teacher professionalism and for the development of teaching competences aimed at improving students' learning (Perla et al. 2021). The research specifically investigates the experience of Distance Learning, to bring out the changes in teaching practice, paying particular attention to didactic mediation and evaluation, two areas considered foundational and emblematic in teaching-learning action. Through the administration of an online questionnaire to which 721 teachers responded, we highlight the metamorphoses involved in mediation and evaluation. What emerged allows us to redefine the "teaching charter" as a "mediated action with a high potential for hybridization", bringing to light the criticalities / potentialities of the pedagogical Third (Houssaye 2000) as a space for experimentation of flexibility teaching. The findings highlighted the need to support teachers' digital training to develop a new type of sophisticated knowledge and the ability to transform disciplinary content into digitalized disciplinary content (Perla, Agrati, Vinci 2019).

Keywords: Hybridization, mediation, digital scholarship

1. Introduction

Contemporary communication tools are changing the sphere of research and teaching activities in the university context, leading to an improvement in teaching and learning actions (Dipace, Scarinci, 2021). However, the changes induced by technological innovation, especially from the point of view of educational practice, have often encountered resistance, resulting in a strong contrast between what happens at the administrative and organizational level and the use of digital tools at the didactic level (Tømte et al., 2019). In fact, despite the various government initiatives aimed at strengthening the infrastructures and technological

equipment necessary to be able to cope with the transformations implemented by technological innovation, in terms of digitization of the teaching and learning process, an investment in teacher training is necessary. (Dipace, Scarinci, 2021). The teacher must, in fact, know how to combine professional, pedagogical, relational and technological skills and be able to evaluate the most suitable technological tools to be used in the various fields and in the construction of a virtual space for the provision of content and the management of interaction with students (Barberà Gregori, Badia Garganté, 2005).

The pandemic crisis has caused an acceleration of this internal and external digitization process and represented a strong break with traditional university teaching. The coronavirus crisis has challenged higher education institutions in many new and unexpected ways, particularly in relation to digitization and digitally enhanced learning and teaching (Estermann, 2020). The World Health Organization declared the COVID-19 outbreak as a pandemic on May 11, 2020. As a result, governments had issued directives that imposed the compulsory suspension of the attendance of degree courses, including the Italian government (D.P.C.M. of 9 March). During the emergency, education has been the subject of national and international government initiatives, becoming an emergency itself and distance education has finally been re-looked as the key to resolving or at least facing the crisis (Williamson, Eynon, Potter, 2020). The pandemic has placed university teachers in front of the need to redesign their teaching actions by integrating technologies in mediation no longer as mere 'functions' facilitating the transmission of knowledge. It has also led to the use of educational technologies, already existing but too little considered as a possible added value to teaching, for the provision of courses that, in the absence of a critical situation, would have been given face to face (Eradze, Dipace, Limone, 2020; Hodges et al., 2020).

Unlike the planned online teaching and learning experiences, the experience derived from the pandemic crisis was implemented without an appropriate preliminary design, bringing out the various problems and deficiencies both in the organizational, infrastructural and in the teaching and digital skills of teachers and of the students (Dipace, Scarinci, 2021). It was not a question of making a transition from presence to an online teaching / learning mode because this, in order to be effective and have a positive impact on the quality of education and learning, requires a good planning of experiences and a capacity for planning teaching and learning by the teacher (Hodges et al., 2020; Barberà Gregori, Badia Garganté, 2005; Aguilera-Hermida, 2020). Instead, we speak of emergency remote teaching, as suggested by Hodges et al. (2020), in which planning, planning and above all the possibility of choice are lacking and whose goal is to offer and guarantee all students "temporary access to education and teaching aids" (Hodges et al., 2020).

As Perla, Scarinci and Amati (2021) underline, the pandemic has confronted teachers with the need to redesign their teaching action, considering technologies no longer simple tools for the transmission of knowledge: teaching is redefined as mediated action to high hybridization potential. Online learning cannot be seen as a mere, extemporaneous transposition of teaching in the presence (EDEN, 2019), as it can change not only the space-time organization, favouring greater flexibility, but also relational dynamics and social interaction, which often require different teaching approaches and skills (Hodges et al., 2020).

Beyond the didactic and organizational difficulties initially encountered, the emergency situation also proved to be a precious opportunity to rethink the forms of mediation in distance learning through technology, in an adaptive and flexible learning perspective (Huang et al., 2020), that is, able to offer wider choices and with a higher level of customization for students.

The network, in this phase, has not only offered a new context for learning without traditional spatial and temporal limits but has also been a "network" in an educational metaphorical sense since it has offered a

space, a constructivist-type learning environment for sharing and building knowledge, safeguarding students' right to study (Calvani, Rotta, 2000). Each student had a "personal" didactic experience: mediation was forcibly re-invented and rewritten through the web within a common space (Cope, Kalantzis, 2008) in which experiences and emotions connected to the imprisonment induced by the prescriptions were also inserted sanitary.

If on the one hand, therefore, this state of emergency has introduced a new and destabilizing element in the academic world, making the planning and intentionality of distance learning disappear, on the other hand it has constituted a push that has accelerated a process of change of the training offer in place for several years but which has often found resistance (Speck, 1996; Mishra, Gupta, Shree, 2020). A change that involves different figures (teachers, students, administrators, technicians ...) and involves a series of adaptations and rethinking from the point of view of teaching and the training environment that becomes digital space. A change that pushes us to reflect on the need for high-quality professional development, for advancement in the field of digital scholarship, for support for teachers' professionalism and for the development of teaching skills aimed at improving learning of students (Perla et al., 2021b).

2. Study objective

The Covid-19 emergency represented a challenge for educational and training institutions and for the parties involved (teachers, students and staff) who had to manage a change in teaching / learning methods: from face-to-face education to an environment of online learning that required a process of adapting and accepting technologies (Aguilera-Hermida, 2020).

This makes it necessary a qualification of the teaching staff' through ‘training activities in terms of methodological and technological updating for the production of multimedia content, for the management of distance learning activities and for the use of technologies’ (Perla, Agrati, Vinci, 2019).

The document "Standards and guidelines for quality assurance in the European Higher Education Area" (ENQA, 2015) provides information regarding the qualification of teachers and the provision of quality teaching material with particular reference to ' personalization of learning situations and materials.

Therefore, an investment in teacher training becomes fundamental to provide them with the skills necessary to create a qualitatively higher experience for students and facilitate the acquisition of knowledge, skills and abilities. The role of the teacher can be considered as an evolving role both in terms of technological mediation of teaching but, above all, on the "diversification of the student population and greater attention to learning outcomes" (ENQA, 2015, p. 13; Perla, Agrati, Vinci, 2019).

From an analysis of the literature on the roles and tasks of teachers in the use of new technologies in teaching (Alexander et al., 2017; Bates & Sangra, 2011) and in online teaching (Educational Testing Service, 2009), it assumes relevance the role of mediation between contents and students played by the e-teacher which takes concrete form in the tasks of searching, finding, selecting critically and making sense of the information available through digital technologies (Perla, Agrati, Vinci, 2019). Specifically, as Perla, Agrati, Vinci (2019: 5) explain, "it refers to 'integrated' but diversified tasks: from making information available (access), to mediating them on the base of contents' meanings (evaluate and manage) , structure of knowledge (integrate and create) and characteristics of the students (communication) ". By focusing on the last three tasks, it is possible to understand the work of the e-teacher of mediatization (Rezeau, 2004), and of sophisticated mediation (Agrati, 2019; Damiano, 2013). "In the task of integration, the e-teacher represents information and re-elaborates it in a synthetic form by comparing it with other sources, useful for extending the knowledge of e-students and the

ability to understand its internal connections" (Perla, Agrati, Vinci, 2019: 5). The task of creation sees the e-teacher engaged in the production of new forms of knowledge that differ from the information present in texts or online. Finally, the task of communication engages the teacher in adapting the new forms created to the type of students. What emerges from these studies with respect to the tasks of the e-teacher allows us to reflect on the well-known descriptive model of teachers' techno-pedagogical knowledge (Technological Pedagogical Content Knowledge) as it highlights the adaptation component - typical of the processes of - learning and not adequately developed by the TPACK authors (Koehler, Mishra, & Yahya, 2007; Koehler & Mishra, 2009; Koehler, Mishra, Cain, 2013; Perla, Agrati, Vinci, 2019). In fact, the TPACK model does not take into account the space to adapt the disciplinary contents to the specific needs of the students: generic pedagogical strategies are not enough, but the creation of new 'entities of knowledge' is necessary, suitable for being adopted by the students. -students (ETS - creating and communicating) (Perla, Agrati, Vinci, 2019).

A revision of this model should include a greater description of the more complex (Damiano, 2013) and sophisticated (Agrati, 2019) e-teacher's knowledge, which could refer to the choice and delivery of effective digital content from the point of view organizational; in particular, the adaptation and remodeling (Eilam, 2015) of the knowledge to be taught on the basis of the characteristics of the e-students (integrate, create, communicate - Education-al Testing Service, 2009; ENQA, 2015) which are effective since point of view of learning on results (Perla, Agrati, Vinci, 2019).

3. Method

The research specifically investigates the experience of DL, defining the construct, to bring out the changes in teaching practice, paying particular attention to didactic mediation and evaluation, two areas considered foundational and emblematic in teaching-learning action. Through the analysis of the metamorphoses taking place in teaching and evaluation practices, we intend to initiate an initial reflection on the impact that they can induce to deeply rethink university teaching in a 'hybrid' direction (Perla, Scarinci, Amati, 2021) (also in the return to normality of resumption of classroom teaching), on the quality of student learning, on the innovation of university teaching and on the highly specialized skills required of the teacher: the ultimate aim, in fact, is to trace - also following impact assessments and further studies of a longitudinal-comparative nature in programming - of the possible trajectories for the professional development of the university teacher.

Through the administration of an online questionnaire to which 721 teachers responded, we highlight the metamorphoses involved in mediation and evaluation. The research comes within the ASDUNI association and was carried out by an inter-university working group. In particular, the following objects of the 'mediation' and 'evaluation' didactic dimensions were investigated:

- DL procedures implemented in the experience, instruments used (in the past / the present / future), media used, the quality of communication with students, student engagement, differentiated teaching methods for students with Special Educational Needs, the relationship between DL and disciplinary knowledge, positive and negative aspects of DL, redesign mode of operations in the situation;
- online assessment, tests and assessment methods used (in the past / present / in the future), moments of the assessment in DL, function of the assessment, feed-back, difference between assessment in presence and remote online assessment, remote online assessment, concerns and / or difficulty in a remote online assessment, training needs in terms of valuation.

The research was conducted in accordance with the ethical and anonymity rules in compliance with the EU General Data Protection Regulation no. 679/2016 and of Legislative Decree no. 196/2003 "Personal data protection code" (amended by Legislative Decree no. 101 of 10.08.2018).

As regards the data collection tool, a Computer Assisted Web Interviewing (CAWI) questionnaire was proposed, consisting of 29 closed-ended questions and 11 open-ended questions. The questionnaire was sent to all Italian universities. Some partial results of the investigation are returned. The required compilation time was 15 minutes.

For both the investigated dimensions - didactic mediation and evaluation - it was decided to insert some questions structured in such a way as to offer, to the responding teacher, the possibility of providing information on past, present and future practices (ie: Which tools has used in the past / currently uses in the DL / and do you think you will use in the future? You can choose multiple response options using the modalities referring to both the past, the present and the future): this choice was determined by the desire to go further the comparative analysis between the practices implemented in the Covid-19 emergency and those carried out in the past, to also understand the wishes of the teachers, therefore the practices considered effective and to be implemented in the future. These questions are functional above all to understand, in a perspective direction, the training needs of teachers towards which to structure professional development paths.

4. Data Analysis

The data were analyzed in aggregate form. They analyzed 721 compilations in total, dividing the analysis of item 29 closed questions (via statesmen-ca descriptive techniques) and that of the open-ended questions (by means of qualitative analysis criteria of the data). 721 university teachers took part in the survey, divided almost equally between male teachers (N = 370; 51%) and female teachers (N = 351; 49%). The age of respondents is distributed with a prevalence of people aged between 41-50 years (31%) and between 51 and 60 years (37%).

As regards the CUN areas of the teachers, the most represented is area 11 "Historical, philosophical, pedagogical and psychological sciences" (147 teachers), the least represented area is area 04 "Earth sciences" (14 teachers). 40% of the respondents are Associate Professor, 25% Researcher, 20% Full Professor, 15% on contract. With regard to regional distribution, the area of Northern Italy and the South and Islands are equally represented, each with 43% of teachers out of the total; the area of central Italy is lower (14%). 39% of the respondents belong to a "large university", with a number of students between 20,000 and 40,000. With regard to the context and organizational analysis, it emerged that in the majority of cases (86%) there are support technicians and that almost all of the collective (91%) received useful information to undertake the DL. As many as 64% of the respondents, however, declared that they did not have the opportunity to participate in technological training activities; while 74% of the respondents declared that they had carried out exclusively face-to-face teaching, before the epidemiological emergency phase; only 136 teachers out of 721 declare that they have integrated some moments online. The section of the questionnaire relating to "didactic mediation" was structured in order to: analyze the practices declared by the teacher in the DL experience, more specifically the procedures used, the tools, the multimedia contents and the differentiated methods implemented for students with Special Educational Needs; make explicit the representations of teachers about distance learning, its positive and negative aspects, its role in changing the relationship with knowledge, the perceived quality of communication with students, the possibilities of future redesign of teaching activities in DL.

As regards the analysis of the practices declared by the teacher, it is possible to highlight some findings worthy of interest. The implemented procedures seem to show a tendency towards critical and participatory activities, such as the presentation of content in the form of demonstrations or explanations (57%) and the presentation of content in the form of demonstrations or explanations that involve a response or product from the students

(24%); very low percentages related to lectures accompanied by slides or recorded lessons. 60% of the respondents declared that the multimedia contents used in the DL in the emergency period were mainly taken from pre-existing material and adapted; 37% declare that they have used ad hoc materials. With reference to the specific tools of didactic mediation, a first data worthy of attention concerns the difference between the past (in which many optional teaching tools have never been used by teachers), present (in which a good percentage of teachers declare to use different didactic tools in DL) and future (in which there is the will to use some tools in particular), with a gradual increase of interest in their use. Suffice it to think, in this regard, that more than 60% of responding teachers (445 out of 716, 5 n.r.) believe that they will use distance learning also in the future.

More specifically, as regards the present, the didactic tools most used in DL are audio-video recordings (49%, n = 350); web conference lessons with skype, zoom, webinar (76%, n = 544); discussion and collaboration environments such as web forums, blogs and wikis, which allow brief interventions by the students (32%, n = 232); software for information processing such as PowerPoint, Excel, Word etc. (60%, n = 433). As for the future, there is the will to use some tools, in particular: Social Networks (17%, n = 124), Demonstrations or additional explanations present in the faq (19%, n = 134); Structured and individual activities, such as reports, exercises, case studies, problem solving, web quests, projects, production of artifacts, simulations (29%, n = 208); activity in web forum with demonstration or operational suggestions on how to solve a problem (20%, n = 141). From the analysis of the data it emerges that inclusive practices, together with those of promoting student self-assessment, seem to represent the "weak points" of distance learning mediation, perhaps even those on which a stronger training investment is required. Evaluation is experienced as a problematic moment and largely characterized by traditional practices. Even in the emergency situation, which could push teachers to find alternative and innovative solutions, the evaluation practices remained mainly anchored to a summative and certification vision. However, it should be noted that a small minority of teachers have been induced to explore new evaluation possibilities, which, even in the face of a generalized resistance to change, appear to be considered promising, given that the data show the greater intention to implement them in the future, compared to what has been done in the past and achieved in the present moment (Perla et al., 2021).

The answers to the following questions allow to explain the representations that the teachers have of the DL. As regards its functions, many teachers recognize the merit of helping to improve the professionalism of teachers (33%, n = 237); a lower percentage (22%, n = 159) believe that DL increases communication interactions between students and between students and teachers; only about 1/7 of the respondents (101 out of 716, 5 n.r.) instead consider the DL as a tool that makes students' learning more effective. As for the quality of communication with students, the answers show a positive picture: for 43% of the respondents it is good / fair; for 16% effective; for 10% excellent / excellent; for 8% it is difficult and for 5% it is not very interactive. 51% of respondents stated that their relationship with the knowledge they teach has been modified by the use of DL (24% do not see a change). The declared change concerns the communication modality with a tendency to a greater clarity of presentation, a care in the preparation of the didactic material and a simplification of the contents.

Another interesting result recorded concerns the activities - in addition to the use of the lesson - towards which the teachers direct the students' commitment: most of the respondents indicate activities of use / analysis of the teaching material (78%, n = 560), followed by from home exercises, problem solving (40%, n = 288) and individual or group product development activities by students (34%, n = 243); a very small number of teachers (12%, n = 90) indicate self-assessment activities, showing a certain criticality regarding the assessment activities in DL, also confirmed by the questions in the next section.

5. Uniba case-study: a curriculum model in higher education

The health emergency has pushed, as already highlighted, the university to a spatial, instrumental and methodological reorganization, as well as to a redefinition of the roles of teachers who have had to redesign their own distance teaching quickly and in many cases without adequate technical and methodological support (Dipace, Scarinci, 2021; Hodges et al., 2020; Scarinci, Dipace, 2019). The results obtained from the survey conducted on didactic mediation and on the timely evaluation of COVID-19, is not limited to providing a simple photograph of the existing, but aims further, to understand the possible implications of development and the implications for the future hybrid mediation and therefore also on digital scholarship processes. It is necessary that the technological achievements no longer "demonized" become part of a didactic action on the part of the teacher.

University management must focus on the system for improving the digital and methodological skills of teachers as they are the driving force that can lead to full innovation. Technologies, in fact, “alone cannot transform educational paradigms, the way of teaching and learning” (Dipace, Scarinci, 2021).

It is therefore necessary to involve the teacher in faculty development processes that enhance community approaches, experiential dimensions, active involvement and reflective learning, in order to support a constant review of professional representations and practices. This is made possible by the active involvement of teachers in planned faculty development actions activated by training institutions aimed at acquiring the necessary methodological and digital skills and having effective tools for quality teaching and improving student learning outcomes (Dipace, Scarinci, 2021; Scarinci, Dipace, 2019).

The University of Bari has started, on the basis of the needs analysis emerging from the PRODID research project (Perla, Vinci, 2018a, 2018b), the structuring of pilot training paths - personalized according to different target groups (see tab. 1) - for the professional development of university teachers in UNIBA Teaching Learning Laboratory (TLL) , located at the Department of Education Sciences, Psychology, Communication.

Table 1: Structure of the training activities of the first edition of FD

Target group				
New recruits, CSD coordinators, heads of teaching units, accreditation group, department directors, first-year teachers 167 people, of which 47 Researchers; 108 1st or 2nd level teachers newly recruited through transfer or qualification; 12 Coordinators of the Schools undergoing an ANVUR accreditation visit.				
Training modules				
Disciplinary syllabi and constructive alignment (teaching methods and evaluation practices with the learning objectives and learning outcomes as expected)	**Didactic mediation** (Knowledge bases, skills and tools for the implementation of learner-centred teaching interventions for small and large groups)	**Effective communication and public speaking** (basic knowledge and skills for effective content communication aimed at student participation/involvement)	**Design and assessment** (knowledge bases, skills and tools for a 'competence-based' approach to the discipline)	**Interdisciplinary knowledge** (shared reflection on the pedagogical and technological components of disciplinary knowledge content. Inter/transdisciplinary connection)

TLL is a multidisciplinary center primarily utilizes pedagogical knowledge, but it also integrates different disciplines to create a broad understanding of teaching-learning processes and their dimensions: the content pedagogical knowledge, the sources that generate it, the methods of its transmission (Shulman, 1987).

The first broader course in university pedagogy was developed in 2018; this was a one-year course targeted for university teachers, which concentrated on Syllabus design, university teaching and on assessing students' learning outcomes.

The main practices of this TLL Centre are:

1. to coordinate and organize courses on university pedagogy for teachers, researchers and doctoral students within all discipline at the University of Bari,
2. to carry out research on faculty development programs for the quality enhancement of teaching and learning and University's strategic development, above all, disciplinary didactic research in which devices, toolkits and joint co-designs with the area of pedagogical disciplines can be tried out;
3. to coordinate the research and the use of digital tools for enhancing teaching and learning at the university
4. to improve teachers' skills and understand the factors of high-quality teaching through assessing the outcomes and impacts of academic development.

The curricular model of TLL is based on the recursiveness between theory and practice and on the representation of the teacher's knowledge as 'professional', practical (Damiano, 2013): it is necessary to understand how this 'sophisticated' knowledge (Perla, Agrati, Vinci 2019) is actually carried out in concrete reality, analyzing the variables, the processes that take place, the procedures, the techniques used.

The model underlying these activities - already tested by the Faculty of Engineering (LTH) of Lund University in Sweden - considers pedagogical competence in teaching (Tågerud 2010, 61) as a spiral process (according to the model inspired by Kolb's Learning Cycle: Kolb, 1984) in which theoretical knowledge (Theory: knowledge of teaching and learning), pedagogical practice (Student learning-Teaching) and teaching skills (Teaching skills: planning of teaching; observation of teaching and learning) interact. TLL includes interdisciplinary teams (Newell, 1994) composed of teachers from different epistemological perspectives who can cooperate in course design and peer learning practices (Perla, Vinci 2021).

The Uniba curricular model has several cascading target levels:

- at an institutional level (macro), the University Quality Presidium;
- at the level of training for trainers (meso), the departmental managers;
- at the level of groups of teachers (micro), the communities of practice constituted from below.

The three main axes of the model concern:

- active learning and alignment between design and evaluation;
- hybrid mediation;
- co-costruction and epistemological dialectics.

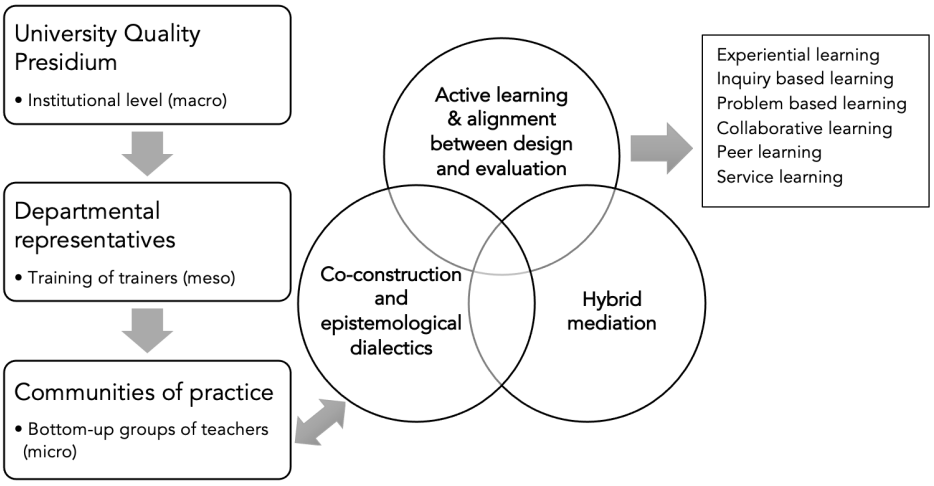

Figure 1: UNIBA curricular model

The model also provides:

- evaluation actions, such as monitoring the path and customer satisfaction actions;
- documentation actions, such as the drafting of an annual training report to be returned to the departmental communities;
- communication actions, such as short video spots and podcasts to be advertised on the University website.

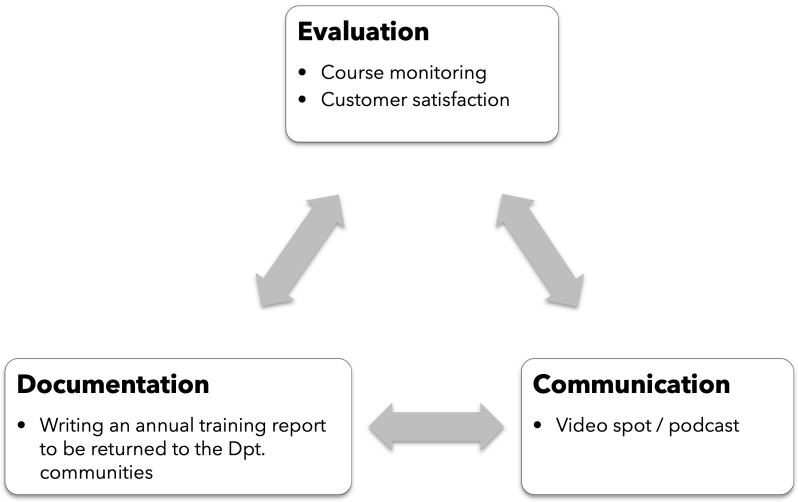

Figure 2: UNIBA curricular model: evaluation, communication, documentation

The training model underlying this knowledge requires knowledge of all the tools - mediators (active, iconic, symbolic), didactic formats, devices for assessing disciplinary and transversal learning - which do not directly produce learning, but create the conditions for learning to take place through processes of translation, transposition, metaphorisation, substitution of experience (Damiano, 2013; Agrati 2020). This wealth of knowledge is not easily transferable into the competences of a "pure" disciplinary researcher also because the disciplinary communities do not encourage research in disciplinary didactics. For this reason, a serious co-research work is needed, to be started in all possible places, because only by scientifically nourishing the

epistemological dialectic between knowledge will it be possible to overcome the obstacle of curricular compartmentalization.

The curricular model is based on adult learning (Knowles, 1980) and methodologies for professional learning, in particular the so-called 'artefacts', which Orland-Barak and Maskit (2017) classify at three levels:

- communication artefacts such as stories, images, cases, videos, simulations, portfolios, lesson-studies, action-research;
- devices that facilitate the generation of practices, for example storytelling or video-recording, analysis of practice, observation or documentation of experience or, again, such as mediatised communication devices (educational technologies);
- artefacts and devices that deal with how to facilitate the dynamics of relationships in order to operate negotiations of experience).

The training model for the university teacher requires a research posture of co-construction and ample space dedicated to the epistemological dialectic between disciplinary teacher and didactic. The training modules designed in the TLL have therefore been constructed on the basis of a constant dialectic (and subject of video research) between the group of researchers of general didactics and the disciplinary target groups.

6. Conclusions

The COVID-19 emergency has placed teachers in front of the need to redefine, redesign their teaching action, considering technologies no longer as simple tools for the transmission of knowledge. They had to rethink and reflect on established practices of their own work and then initiate a substantial review in the direction of improving student learning outcomes. What we experienced constituted a period of breaking, learning through practice and reflecting practices on our forms of teaching and learning that had to break with the traditional transmission model and exploit the technological potential so that the new technology could "do. something different from what learning technology has always done: imparting academic knowledge to the student", as Diana Laurillard (2020) argues.

Teachers and students found themselves living together in an educational space to be reimagined in a short time: the digital one. This re-imagination is not at all simple because, unfortunately, space is not a category that has been placed at the center of the interest of pedagogical research (Damiano, 2013) even if some have experimented with new languages, new practices, new methods. time also in the university environment (and not only remotely) in a learning-centered perspective (Deschamps, 2018; Scarinci, Dipace, 2019).

The survey made it possible to redesign the "didactic paper" (Damiano, 2013) as a "mediated action with a high potential for hybridization", bringing to light the criticalities / potentialities of the pedagogical Third (...) as a space for experimentation of flexibility in 'teaching. Among the most relevant theoretical problems of contemporary teaching we find that of the search for tools and devices through which to induce effective, meaningful and stable learning and, in the investigation, the context of "entirely remote" made it possible to obtain very interesting inferences for the study of mediation (Perla, Scarinci, Amati, 2021).

The study also demonstrated the urgency of a reconfiguration of teaching in higher education systems and of the role of the teacher. necessary rethinking of the university teacher who must start from his didactic training. A training that must lead to the integration of professional, pedagogical, relational and technological skills (according to the framework of TPCK) and make teachers able to evaluate the most suitable technological tools

to be used in the various fields and able to adapt the disciplinary contents to the different needs of students in terms of customization (according to the framework of the “sophisticated knowledge”).

The research results also make it possible to critically problematize didactic mediation in the context of higher university education in a direction of revision of the ways in which the teacher chooses, uses and transforms disciplinary contents into digitalized disciplinary contents (Perla, Agrati, Vinci, 2019).

In summary, the research offers interesting opportunities for understanding and deepening the distance teaching action, both in didactic mediation and in evaluation. At present, it seems very urgent to channel the result of the lived experience towards a profound renewal of teaching which, fully welcoming the perspective of the active centrality of the student, prepares a new professionalism of the teacher capable of guiding teaching 'with' it is beyond the same DL.

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Innovation in Distance Higher Education. Trends and Topics

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Abstract

Technology has been playing an essential role in the methodological change of higher education. The creation of the European Higher Education Area has meant a revision not only of strategic update about the mobility of the European Union workers, but also of the learning methodologies in the university. The univocal transmission of knowledge, massive groupings in conference rooms, training based on information without reflection, and strictly reproductive pedagogies have been questioned. In the last decade we have witnessed proposals that recalled the emblematic trends of the Active School. Thus, activity has been promoted as a learning centre, the student are the protagonist of its development, gamification is a key for the engagement of students, collaborative methodologies supply individual ones, recreational simulations and project work are carried out, training is designed taking in account employability, designs are based on competences, the content are more flexible and diverse, the exchange of students and teachers is promoted among universities, new spaces and organisational designs are supported, the innovation is valued as an essential engine of change, the inclusion of all human diversities is strengthen, and the development of technological tools have revolutionised learning. These are just some of the changes that we have been able to observe and that are profoundly transforming the entire European university landscape. In this dynamic framework, distance universities have important challenges and opportunities for which we present proposals and recommendations.

Keywords: New Competences; Teachers; Didactics; Innovation.

1. Introduction

The creation of the European Higher Education Area has meant a revision not only of strategic update about the mobility of the European Union workers, but also of the learning methodologies in the university. The univocal transmission of knowledge, massive groupings in conference rooms, training based on information without reflection, and strictly reproductive pedagogies have been questioned. Supported by innovation, the universities are implementing new projects and experiences trying to improve their praxis and engage their community. Many traditional universities are carrying out programmes with distance methodologies. The coronavirus pandemic has offered a new opportunity to demonstrate that traditional universities needed alternative ways to teach and to learn has provided occasions to reflect and research on (Răducu and Stănculescu, 2021; Coman and alt, 2021; Yu and alt, 2021). The students are the centre of the learning process

and are demanding new strategies and resources. That implies the promotion of activity, the gamification, the start from the closer knowledge, the autonomy and self-regulation, means for the direct perceptions, the creativity development, the competency based design, the simulations, problem based learning, increasing the employability, the transference to real life, the flexibility and diversity, the design of versatile spaces, the promotion of mobility, the inclusion and accessibility, the use of technology, the collaboration, and the learning based on projects. We reflect all these experiences and observations grouping them in 20 trends.

At least, in the last decade, we have witnessed proposals that recalled the emblematic trends of the Active School and the Progressive Education.

2. Trends and Topics

2.1 Innovation

The innovation is valued as an essential engine of change (Vincent-Lancrin and alt, 2019). Innovation is also a strategy aimed at activating and improving training processes. Permeate many of the transformative strategies of university centres, trying to motivate teachers to continue looking for more appropriate, effective methodologies than those they used in a traditional way (van der Rijst and alt, 2019). The innovation is a whole process takes place through the development of new solutions, changes, or different orientation of processes or products. It can focus on effectivity, improvement, risks reduction, technification, simplification, making easier, shortening length, and other types of developments. Innovation is one of the modern keys of professional competences, including education.

2.2 The student as the centre of the learning process

The student is the protagonist of its development. One of the fundamental changes of the Progressive Education, a pedagogical movement that began in the late nineteenth century, was the reconsideration of the concept of childhood from a conception of the child as a small adult to an individual with his own traits, characteristics, and needs. This reconsideration has also led to the revision of educational objectives, especially regarding learning. In this way, it has gone on to reconsider the subject of learning as an active agent that can direct, regulate, and modulate his/her activities based on his/her interests, his/her needs, and his/her obligations. The whole stream of the Progressive Education has assumed that approach, and we have inherited that new vision oriented to provide a space for each one and to recognize the capabilities of each student (Nygaard, 2008; Seng, 2014; Fook and alt, 2016). Any student-centred methodology, activity, or procedure is based on this principle.

2.3 The promotion of activity

The activity has been promoted as a learning centre. The principle of activity gives a participatory, and dynamic role to the student in his/her learning. The student is the engine of learning. Activity is not only understood as a psychomotor one, however can also refer to mental activity. The use of problems, analytical tasks, or co-work activities are examples of the application of the principle of activity. Classical authors such as Rousseau, Pestalozzi, or Froebel are examples of the Progressive Education supporters of the activity (Sugrue, 2010; Jelly & Mandell, 2017). The principle of activity therefore varies from one discipline to another and is perfectly adapted to procedural contents of any nature. The competence approach necessarily entails the application of the principle of activity for the development of content of a procedural nature. It is important to note that the procedural contents are not independent of the conceptual, and attitudinal contents such as those that are integrated, and are also considered procedures related to the other areas.

2.4 The gamification

The gamification is a key for the engagement of students (Kingsley and Grabner-Hagen, 2015; Bharamgoudar, 2108). Gamification is based on the use of playful techniques applied to tasks that are not usually playful. This seems quite logical: we don't gamify a game. The game is fun by itself. In this way, it is possible to provide satisfaction, enjoyment, well-being, bliss, entertainment, fun, surprise, and pleasure by learning. The usual mechanisms used are reward, achievement, status, competition, humour, fun contents, surprising situations, open settings, or random elements. Gamification is not the same as the introduction of the game, which has its rules, its roles, and its mechanisms. Gamification is a “polluting" technique that aims to impregnate with a fun character an activity that is not usually. Although historically it was linked mainly to the earliest ages, its use in high levels of training has given it a new status nowadays and it is accepted and considered as a very valid strategy also in the university. Nowadays gamification is also used in so many environments as companies’ management and marketing techniques (Linder, 2013; Paharia, 2013; Basten, 2017).

2.5 Starting from the closer knowledge

Learning must be fed by the environment in which it occurs. This does not entail a limitation of sources or content to what is close, however it establishes a connection between new learning and previous knowledge. This connection facilitates the understanding and construction of new schemes and structures from those previously acquired (Haberkorn and alt, 2014; Bateman & Church, 2016). The development of these new learnings also favours the student's own ability to develop these connections, and new learnings by himself. The principle establishes the dynamics which starts from the closer place to go to the farer one, and that is a very logic physical determinism. This principle also allows understanding better the new concepts, links the new knowledge to previous one, and makes easier its transference to new situations and context.

2.6 The autonomy

Each person is an individual with his/her interests, characteristics, and needs (Drexler, 2010; Kupers, 2015). However, we are talking about something else: we are talking about that progressively, in the same way that we grow physically, we need to develop autonomy and depend less and less on others. We need to learn to make decisions and solve problems. This capacity cannot be developed if we always plan learning in a structured and predictable way, and avoid mistakes, problems, or decision making. Autonomy, also called self-regulation for some authors (Gayle,2015; Michailidis and alt; 2018), will be developed, like almost all competences, by exercising free will and confronting decision-making. This risk can only be taken when we face it alone, even if we are inspired by other people's decisions or ask for advice. In Distance Education, it is also a fundamental capacity for the success of students and the reduction of dropout.

2.7 The direct perceptions

The perception of objects, actions or living beings facilitates their understanding, their imagination, and their representation. Classical authors named it the principle of intuition the fact of presenting through the senses the concepts to be explained. The simple visualization, listening or perception of some phenomena makes easier their understanding much better than the reading of descriptions or definitions (Coyne and alt, 2018). This is the basis of all the didactic resources we use to present, represent, or transmit concepts, ideas, or actions. The on-site visits to museums or other special places are example of direct knowledge (Hsu & Liang, 2017; Gregoriou,2019). In a world in which the image prevails, we almost assume that many concepts can only be explained through their observation or recordings as videos (Xiaojuan & Huiwen, 2021). We forget that not many years ago most of the teaching was based on the mere verbal transmission of content. In some areas, this praxis remains a fact. This idea is fundamental at any level, and in any formative situation so that we reach conceptualization, and verbalization through the integration, and internalization of perceived ideas.

2.8 Creativity

While problem solving often uses convergent thinking, the creativity is the strategy based on the divergent thinking. In the first case, algorithms are usually applied; in the second case, we prefer employing heuristics, that means stimulating techniques to open the mind and find original solutions or products. Frequently, open ended questions, non-directive instructions, or freedom are sufficient to generate creative answers. Sometimes teachers need applying techniques to stimulate original responses, for instance, Brainstorming (Wilson, 2013), Mood boards (Lucero, 2015), Fantastic Binomial (Rodari, 2013), Storyboarding (Wikström, 2013), Metaphorical thinking (Hendriana, 2017), Mind mapping (David, 2011), and many others.

2.9 Competency-based design

The designs are usually based on competences. Competency-based design has its origin in the description of work activities. A competence is a skill or ability of a worker in performing his/her job. From this descriptive quality, we have moved on to use it for the definition of the training that this worker must receive to train for that work activity. In a way, we have transformed some statements of a descriptive, defining type into statements of a teleological nature, that is, we have given it a training purpose (Gruppen and alt, 2016). Competence-based design thus affects the purpose of education, however also the conception of learning in that it highlights the procedural and attitudinal skills necessary for professional development and performance in a job (Velasco-Martínez & Tójar-Hurtad, 2018).

2.10 The simulations

The recreational simulations are god strategies (Ifenthaler, 2013). Simulations signify a representative form of intuition or perception to which the experience of action is added (Montagus & Boronat, 2014). Sometimes online and on-site experiences could be combined as in museums (Hsu & Liang, 2017). It is about creating situations in which we are going to act in an analogous, equivalent, or similar way to how we would in actual contexts. Certainly, this principle makes sense when real actions are difficult, costly, or distant. The simulation aims at an experience like what we would obtain by performing the real activities, however it omits the dangers or difficulties that this presents.

2.11 Problems based learning

Problem-based learning is a form of application of the principle of activity, and simulation (Dolmans and alt, 2005). Problems are situations well taken from real life or copy from reality to find solutions to obstacles, difficulties, or inconveniences of real facts. Although some didactics of scientific disciplines are traditionally based on problems such as mathematics, other contents can also be raised as situations of reflection, analysis, and debate, for example, in philosophy. Therefore, the problems have a wide spectrum of didactic application in university education with a large tradition (Leary and alt, 2015).

2.12 Increasing the employability

The training is designed taking in account employability (Donald and alt, 2018). Work is one of the most general concerns not only in the youngest, however in the population of any age. That is why much effort has been placed on imbuing job training throughout university education. This does not disdain knowledge by itself, however it is intended that it also has a projection and applicability to work situations in the environment (Bennett, 2020). By applying the principle of employability, we understand that training should not necessarily be oriented to competence development for a specific job, however that it should create the conditions and skills that will facilitate the performance of your professional activity. Some strategies as the scholarships are related to (Diver, 2019). This also entails attitudinal and procedural competences aimed at personal organization, and job search, without disregarding the set of transversal competences in general.

2.13 The transference to real life

The principle of transference prepares students to apply their learning to real life (Araiza-Alba, 2021; Down & Golam; 2021). A competence approach must apply learning to real situations. This affects both the sources of the learning object – the contents or the experiences –, and the application of the procedures learned. The transference provides meaning and application to learning. It does not avoid the possibility of conceptualization, which must be part of the higher levels of the most complex competences, however it projects it into practice ensuring the connection between the two levels of training (theory, and practice).

2.14 Flexibility and diversity

The contents and procedures are more flexible and diverse (Sun and alt, 2008). The development of psychology, and the understanding of human qualities has led us to understand that people with very different qualities can perform activities very correctly (Morris & Bilich-Eric, 2017). Therefore, it is necessary to admit that there are always different ways to develop skills, acquire knowledge, or learn to live and be. We must admit even that we can achieve very correct performances with very diverse capabilities. It is therefore necessary to admit that we can provide students with various resources, various learning procedures, and different assessment systems without incurring gaps in training (Dimitrova and alt, 2003). Time is also an important variable of learning, and the possibilities of choice, election, and optionality will also allow processes to be made more flexible without reducing their effectiveness.

2.15 Versatile spaces

New spaces and organisational designs are supported (Stewart, 2008). The training spaces are traditionally specifically designed for this purpose, which allows them to be provided with resources for the stay, and resources for learning. However, versatile spaces that allow adapting, and changing for different purposes depending on the type of activity you want to do has become increasingly relevant. This allows to offer very diverse activities having to force students, and teachers to go to specific spaces for it. The hybrid spaces also connect work life and universities (Bennett, 2020).

2.16 The mobility

The exchange of students and teachers is promoted among universities (Buchem and alt, 2018). Mobility to other institutions for both, students and teachers, has been favoured, for instance, with Erasmus Program in Europe (Llurda and alt,2016). This strategy allows flexibility, and development of people's adaptive capacity, knowing new realities, and transferring from situations outside to their own situations learning, and solutions that we have observed as effective. Mobility is also a principle traditionally applied to learning ensuring that students can move to other situations are realities to know them first-hand. This is the reason for carrying out internships in workplaces. This also apply new methods as blended learning (Ellis and alt, 2016) or flipped classroom (Sun and alt, 2017). Also, just as ancient philosophers used, it can be used as a form of walk for reflection, and analysis in motion.

2.17 Inclusion

The inclusion of all human diversities is strengthening (Qvortrup & Qvortrup, 2018). Diversity has been focusing especially on disability, but includes all aspects of personality such as gender, culture, language, social class, profession, ideology, etc. Diversity includes aspects that the person can choose and others that the person cannot choose (Sunhee, 2018). A person cannot choose an illness, a disability, or the social context in which he/she was born. A person can choose an ideology or a profession, although no one should force him to choose one or the other. Inclusion requires both organizational and didactic strategies in the classroom that facilitate accessibility, flexibility, visibility of human differences, training about inclusion, respect for diversity, and the

perception of group belonging. Accessibility is today fundamentally digital in Distance Education, but it must continue to consider adjustment processes, human support, and the consideration of positive measures to promote the conviction and empowerment of stakeholders in situations of discrimination when required.

2.18 Technology

The development of technological tools has revolutionised learning. In each epoch, technology is put at the service of human activities at the level of development it has. This is reflected especially in the teaching resources. At the time of Classical Greece, knowledge was embodied in clay tablets. In the fifteenth century, with the birth of the printing press, Gutenberg popularised the books as can be seen in the manuals of Comenio. Modern times brought the popularization of textbooks from publishers with mass character, worksheets and chalk brains. Today, education cannot be understood without digital devices and multiple applications (Yishay, 2014). They have also revolutionized Distance Education from correspondence education, education supported by didactic units, the incorporation of audiovisual media and now training platforms, open courses and social networks. The acronym of ICT that refers to Information and Communication Technologies was popularized (Tait and alt,2019). They are the natural evolution of the technological development of our time, and we cannot fail to incorporate them in the same way that parchments or printing manuals were incorporated in their day. Not all countries have developed ICT in their schools as well (Wastiau and alt, 2013). They are children of their time. As in other times, they also entail the need to learn to handle them properly and this is also a function of education.

2.19 The collaboration

The collaborative methodologies supply individual ones (Zuo and alt; 2020). The principle of socialization replies to one of the basic missions of the school. The school must incorporate students into society. This means that students must be trained to participate in social life. We are gregarious beings, and interaction with other human beings motivates us, activates us, and generates our self-conception and feelings of belonging. In fact, most of the qualities and abilities we develop are acquired through contact and interaction with other human beings. Therefore, the design of group activities can provide efficient satisfactory learning opportunities. In Distance Education, collaboration is also usually supported by technological means (Zaphiris & Ioannou, 2018).

2.20 Learning based on projects

The project work is carried out in diverse situations and contexts, as personal, as professional ones. Projects present a set of sequenced tasks that students must perform individually or in groups to achieve a goal (Fajardo & Gil, 2019). A project is usually presented as a complex situation composed of various functional or descriptive elements. Projects are also very diverse in nature (Capraro and alt, 2013) and affect any discipline in which we can design an activity global and complex enough that it can be broken down into tasks, and actions that compose it. Some pedagogues used projects as a method as Kilpatrick (Retter, 2018; 2019).

3. Conclusions

These are just some of the changes that we have been able to observe and that are profoundly transforming the entire European university landscape. In this dynamic framework, distance universities have important challenges and opportunities for which we present proposals and recommendations.

- Distance universities must design strategies based on innovation to assure their evolution.
- The students must be the centre of learning, specially of the resources and methods.
- The learning must be improved with active, gamified, and collaborative methodologies.

- The context must be the starting point of all our strategies using it as a strength to connect to international dimension.
- The collaboration among all the distance universities through the EADTU must strengthen its role as interlocutor and guide.

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Pedagogical Innovation and Distance Education in Higher Education in the (post-) COVID era

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Abstract
The COVID-19 pandemic highlighted the urgent need for higher education institutions to promote pedagogical innovation. Although it is evident that distance learning is different from emergency remote teaching, this crisis response provided a good opportunity to acknowledge the benefits of distance education. However, for an effective and sustainable change it is essential to identify the key success factors of distance learning. This paper presents the main contributions of a research related to the transition from face-to-face to remote education, carried out in a Portuguese Higher Education School during the COVID-19 pandemic, that explored college students and teaching staff acceptance of emergency remote teaching. From a methodological point of view, we followed a quantitative approach with the application of two questionnaires, one to the students and the other to the teaching staff. We have identified some constraints faced by the respondents, but also a set of factors with a positive impact on distance education success: access to technological resources, digital skills, work conditions, heavy workload, and learning environment; flexibility, guidance, and interaction; assessment criteria and practices are some examples that will be discussed in this paper. Findings from this study enhance the discussion around dimensions such as pedagogical innovation and the development of teaching staff digital skills. Additionally, findings revealed openness of professors and students to adopt distance learning in the future. Finally, these conclusions contribute not only to improve institution's study programs, but also to pave the way for the creation of new ones in distance learning modalities (b-learning or e-learning).

Keywords: COVID-19 pandemic, distance education, emergency remote teaching, higher education, pedagogical innovation.

1. Introduction

There has never been so much interest in discussing pedagogical innovation, digitalization, and online learning in higher education as in the last two years. Although digital transformation of higher education institutions has been considered a priority for years, the COVID-19 pandemic has accelerated this process (e.g., García-Morales et al., 2021). Unlike pedagogical changes from face-to-face teaching to blended learning or fully distance learning, this sudden imposed shift caused by the COVID-19 pandemic was unplanned (Iglesias-Pradas, 2021) and the vast majority of students and faculty member had little background or prior experience in distance education (Stewart & Lowenthal, 2021). The disruption caused a great impact in the way most higher education institutions deliver their courses (Iglesias-Pradas, 2021), especially in practice disciplines such

as medicine, laboratory science and nursing (Klemm et al., 2020). However, according to a UN policy brief (UN, 2020) the migration of learning activities to distance learning has been an opportunity of many higher education institutions "to expand flexible learning modalities, setting the stage for a sustained shift towards more online learning in this sub-sector in the future" (p. 12). In this context, this article reflects on the opportunities and challenges that students and faculty members from a Portuguese higher education institution foresee in the abrupt migration of the learning process that occurred in 2020.

1.1. Pedagogical innovation and distance learning in higher education

In the past decades higher education systems have been pressured to boost pedagogical innovation to meet the challenges of technological developments and preparing citizens in an increasingly complex society (Canals, et al, 2019). Some authors like Gilbert et al. (2021) say there's a need for pedagogical innovation in today's higher education which is supported or constrained on five dimensions: the teacher, the institution, colleagues, students and the teaching environment. Even though it's difficult to find in the literature a clear definition of pedagogical innovation, it requires a "one-off, measured and sustainable positive change" (p. 196, Walder, 2014).

According to a study developed by Walder (2014), there's a recurrent confusion in faculty members between technological innovation and pedagogical innovation that needs to be clarified. Salmon (2005) stated that this demanding endeavour will not be achieved by learning technologies alone because academic staff are reluctant to change the methods of teaching without fully understanding the resultant benefits. Referring to the specific case of distance learning, this author adds that staff with no experience in e-learning wrongly focus on technology rather than pedagogical innovation. Nevertheless, in the literature is consensual the benefits of distance learning by creating "interactive learning environments that are student-centred and offer personalised learning" and preparing "graduates for a globalised world of complex systems and rapid change" (p. 383, Rospigliosi, 2020).

Some authors envision that COVID-19 brought insights to boost pedagogical innovation as online and blended learning proved to be a successful way of delivering courses (Agasisti & Soncin, 2021; García-Morales et al., 2021; UN, 2020). Besides, this crisis context provided the opportunity to higher education institutions to be abreast with the rapid emergence of new technologies and enhance students' learning experience in a digital immerse environment (Ali, 2020; García-Morales et al., 2021).

1.2. Emergency remote teaching constraints and opportunities

The crisis-response migration of learning methods adopted in higher education institutions is very different from a properly planned and developed online learning rooted in effective theories and models and, therefore, it can only be seen from the perspective of emergency remote teaching (Adedoyin & Soykan, 2020). Although some institutions seemed better positioned to respond to urgent migration of learning processes, due to their previous experience with fully or hybrid courses (Bartolic et al., 2021), many institutions have implemented rapid responses that mistakenly involve technologies as if they were distance learning experiences (Hodges et al., 2020). According to the authors, the quality of online learning has long been questioned, despite research showing quite the opposite, and the cluttered transition to online learning due to the pandemic crisis can consolidate this mistaken perception. Baggaley (2020) called it a reputational damage to distance education during and after COVID-19 era.

In the past year many articles focused on the constraints and opportunities of emergency remote teaching in light of COVID-19 pandemic. Drawing on specific literature, we describe the constraints identified by the main agents involved in the process: students and faculty members. First, technology was pointed out as one major

challenge for higher education institutions across the globe, obviously, because online learning is entirely dependent on technological devices and the internet (e.g., Adedoyin & Soykan, 2020). Besides the need to improve technological infrastructure in higher education institutions, staff members need to have the capacity to use them effectively (Ali, 2020; Lapitan et al., 2021; Muthuprasad et al., 2021). From the teachers' perspective, this forced transition to online learning was highly demanding without the proper skills (Govindarajan & Srivastava, 2020; Dwivedi et al., 2020) and clear guidelines from the institution about their new role and workload (Guangul et al., 2020). Teodorescu et al. (2021) highlighted that much of the support given to instructors focused on the technology tools and there were limited training opportunities on how to integrate these tools and develop adequate online learning activities which contributed to a lower perception of the quality of the online courses. Furthermore, Aguilera-Hermida (2020) study demonstrated there's a need to train students in new technologies.

Digital competence of both students and instructor has an impact in the effectiveness of online learning (Adedoyin & Soykan, 2020), however, Kulikowski et al. (2021) study determined that reciprocal communication between teachers and students had a higher influence on students' satisfaction regarding emergency forced pandemic e-learning than technological concerns. Another study focusing on college students' use and acceptance of emergency online learning, developed by Aguilera-Hermida (2020), also confirmed that the lack of interaction was a motivating factor for students, especially because they did not choose to pursue an online or hybrid program. Moreover, the author emphasized that "accessibility is crucial for a successful online learning experience (...) accessibility is not only related to access to the internet or a device, but it is also related to the number of people living in the same house" (p. 6, Aguilera-Hermida, 2020). In fact, students and teachers' working environment may cause disruption during the online teaching and learning process (Adedoyin & Soykan, 2020). Another factor that has an undeniable impact on students' performance during Covid-19 pandemic is socioeconomic background (Adedoyin & Soykan, 2020). Aligned with this idea, Govindarajan and Srivastava (2020) stated that online education amplifies the digital divide.

The forced adoption of online learning brought some issues related to the learning process, namely assessment, heavy workload of the instructors, and compatibility (Adedoyin & Soykan, 2020). The latter aspect refers to the fact that the transition to online learning was quite smooth in social science and humanities courses but highly problematic with sports sciences, engineering and medical sciences that rely on hands-on instructional activities (Adedoyin & Soykan, 2020; Klemm et al., 2020). Buttler et al. (2021) determined that the greatest factor that influenced students' perceptions of the shift to emergency remote teaching was the support provided to students to complete learning activities (e.g., assignments, timely feedback, and consistent communication). Still related to the learning process, students' also revealed concerns about the format of the final exam, the learning schedule and the Learning and Management System (LMS). Bozkurt et al. (2020) refers that online learning brought an urgent necessity of rethinking assessment methods and concerns about surveillance, ethics, and data privacy. Conducting assessments remotely was particularly challenging for teachers due to academic dishonesty and the lack of preparation and infrastructure (Guangul et al., 2020). Some studies highlighted problems in maintaining students' interest and engagement during online classes (Lapitan et al., 2021; Mishra et al., 2020) and students missing lectures (Mouchantaf, 2020).

Organizational readiness during the pandemic crisis, as demonstrated in Iglesias-Pradas et al. (2021) study, contributes to successful implementation of emergency remote teaching and, consequently, to students' academic performance. Besides individual and instruction-related aspects, the authors concluded that aspects related to the institutional response like technical infrastructure support, informal communication channels, and the development of digital skills of faculty members have a positive effect in adapting teaching. Similarly,

Kulikowski et al. (2021) study revealed that students' idea of a disorganized institution during this crisis is strongly related to a negative perception about e-learning. The lack of institutional help and training emerges is a frequent challenge mentioned by faculty members in many studies (e.g., Mouchantaf, 2020). Finally, Agasisti and Soncin (2021) concluded that higher education response to COVID-19 was only successful, because of community engagement.

Findings from a survey applied to 1148 academics in universities in the UK reported an abundant number of what the authors called 'afflictions' that can be associated with emergency online migration that overshadow the potential benefits. However, respondents recognized some 'affordances' of digital pedagogies, like the importance of acquiring skills and expertise for the evolution of universities' digital provision and what was frequently considered as a constraint that is a more controlled environment of teaching from home. In effect, this situation created an opportunity for teachers to improve their digital literacy and at the same time, for some of them, to embrace online pedagogy (Yang & Huang, 2021). From students' standpoint, online education during COVID-19 was found to be advantageous for its flexibility and convenience for the learners (Muthuprasad et al., 2021). Oliveira et al. (2021) characterized the educational process of several higher education institutions in Portugal and Brazil during the COVID-19 pandemic through students' and teachers' perspectives and one major conclusion was that there was an increase in teacher-student interaction.

The study by Seabra et al. (2020) involved 26 professors and 38 higher education students, whose activities prior to the pandemic took place in full or in part, in face-to-face modality. The results of this study pointed to a convergence in the perspectives of teachers and students and to an emphasis on synchronous practices. Despite sensitive aspects such as evaluation, student involvement, practical activities, technical issues or time management, all stakeholders recognized the advantages of emergency remote learning. For example, teachers pointed out as strengths the involvement of students (also mentioned as difficulty), the increase in teacher/student proximity and the learning of new methodologies. In addition to this, students also confirmed those ideas and expressed interest in maintaining the learning model (at least in part). The researchers conclude that time/workload management could be a key element in ensuring the sustainability of online learning initiatives.

For Yang and Huang (2021), COVID-19 experience brought positive insights for the future of universities so that the teaching process can be more centered on students. Likewise, Agasisti and Soncin (2021) refers that this experience had a positive effect towards innovation and improvement of teaching and administrative tasks. This experience can be advantageous to change the prevailing depreciative view of online education and for diversifying the learning process (Martins et al., 2021). To overcome the problem of adapting practical courses to online settings, faculty members had to rely on remote simulations and develop demonstration videos (Klemm et al., 2020) that enrich the existing pedagogical resources even when returning to the face-to-face system. Additionally, COVID-19 forced the use of remote assessment techniques which entails discussing with students' academic integrity issues and ethics through the learning process (Guangul, et al., 2020).

Regarding institutional matters, COVID-19 outbreak provided an opportunity to build a training system of digital pedagogy capability for teachers and the promotion of international cooperation in education at a lower cost (Yang & Huang, 2021). Like García-Morales et al. (2021) emphasized "the disruptive impact of COVID-19 and the digital technologies that can support online learning is an unprecedented opportunity for the transformation of higher education at a global level" (p. 6). This crisis is an awakening call for the need to prepare all stakeholders with new skills and values (Oliveira et al., 2021). Finally, Adedoyin and Soykan (2020)

discussed that this sudden response of higher education institutions created a great opportunity for research advancements in order to provide solutions to meet important challenges of online learning:

> (a) the need to provide models to accommodate the contemporary changes in online learning, (b) review the process of digital transformation of institutions, (c) designing of more scalable and personalized online learning models, (d) designing of online learning model that will reduce the workload on the instructors, (e) redesign the learning process. (p. 7)

2. Method

Given the novelty of the object of this study, such as ERT during the coronavirus pandemic; and the need to know more about the topic, we choose to use exploratory research (Swedberg, 2020).

2.1. **Participants and research setting**

Superior School of Education of Santarém is one of the five schools of Polytechnic Institute of Santarém (PIS), a city about 90 kilometres north from Lisbon, the Portuguese capital. In the school year 2019-20 over 595 students attended 1st and 2nd cycle degree (Bachelor's and Master's degree) programmes.

PIS suspended face-to-face classes from March 16, and only reopened the following academic year. The transition to online classes occurred almost immediately but it was a very tough process owing to the lack of experience in offering online courses. At that time, few academic staff possessed the appropriate pedagogical skills to implement ERT and/or use some of the three platforms available (Zoom®, Microsoft Teams® and Moodle®).

In that context, it was urgent to identify through students' and teachers' perspectives constraints of this experience to plan strategies to overcome them; and opportunities to promote the desired pedagogical innovation and digital transformation of higher education institutions. Therefore, we developed a survey to be applied to all students of PIS with the approval of the head of the institution. The Pedagogical Council of the Superior School of Santarém required our help to understand teachers' perceptions on ERT, accordingly another survey was developed. Because our sample in the second survey was limited to one of the schools of PIS, this article only presents the data analysis of the first survey referring to students from that school.

108 students responded to the questionnaire of a total 595 that were attending a master, a bachelor or a professional course program in the academic year of 2019/2020. More than a half of the respondents (53%) were new students, who were admitted in Fall 2020, and only 13% were in the last year of the programme (Bachelor – 9; Master – 5). The majority of the respondents were undergraduate students (74%), 23% were enrolled in graduate programmes and the remaining were attending professional courses.

The 33 teachers that responded to the questionnaire, about 60% of the total of the academic staff of the institution, are from different fields, such as social sciences, science and mathematics, education and curriculum, languages and literature; and arts. We emphasize that 54.5% of the teachers reported they were teaching Curricular Units they have never taught before, which implies an increased effort in the preparation of classes; also, to note that 48.5% of the teachers were teaching 4 or more different curricular units (one of which taught eight).

For both students and teachers, the representation according to gender corresponds to the distribution that we can find in the School, in which there is an over-representation of women in relation to men. Aged between 25 and 65, more than half of the teachers are over 45 years old (54.6%). Considering the students, their ages range from 18 to 60 years old; the average age of the students who answered the questionnaire is 26, with a median of 21 years old.

2.2. Procedure and Instrument

Both surveys were constructed using the online tool GoogleForms® and disseminated via email. All participants were informed about the research objective, and participation was voluntary. Participants responded anonymously, and confidentiality was guaranteed. The first part of the questionnaires was composed of closed-ended questions, some of them Likert scale type. The questionnaire also included two open-ended questions about the challenges and opportunities of ERT in the students' and teachers' perspectives.

Students' survey was launched on the 14th May 2020 and remained open for six weeks. The 29-item questionnaire administered to students had five sections: section 1, general information; section 2, working conditions; section 3, ERT experience; section 4, remote assessment; section 5, challenges and opportunities of ERT. A total of 99 students answered the last question reporting challenges and 94 reported opportunities related to ERT.

Teachers' survey was available between the 18th and 30th of May. The questionnaire had 40 questions organized into five sections: the first section required demographic information such as the teacher's age, department, number of courses being taught, number of students, and working conditions at home (e.g. number of children); the second section focused on teachers working conditions in ERT; the third section explored the participants' views on ERT; the fourth section intended to find out which resources and learning activities were used by the participants; the last section, consisted of identifying challenges and opportunities of ERT. A total of 31 teachers indicated positive aspects and constraints of ERT.

2.3. Data Analysis

The data was analysed using SPSS version 24.0. Descriptive statistics were generated to better grasp the participants' demographics including frequencies. The open-ended questions were analysed using grounded theory (Strauss & Corbin, 1994). Data were analysed and after that, the categories were grouped into themes.

3. Findings and Discussion

As it has been happening all over the world, and in line with other studies, we were concerned about the impact of the COVID-19 pandemic on the quality of the teaching learning process in our institution, aware of the different circumstances and contexts surrounding these processes and the social conditions of existence of those involved.

One important dimension analyzed relates to the remote working conditions for both teachers and students (Figure 1).

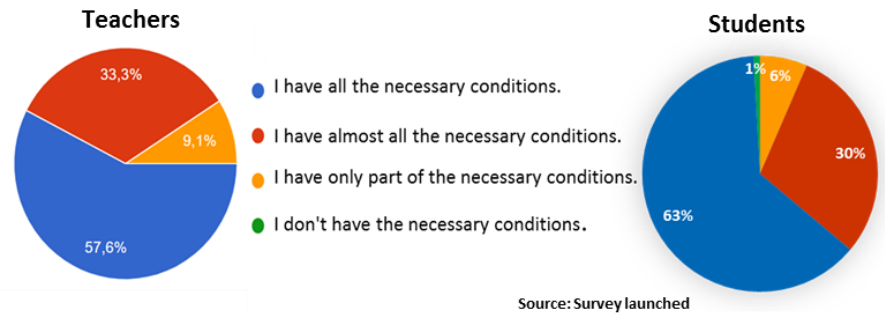

Figure 1: Representations of teachers and students about their remote working conditions.

We can say that their representations are quite satisfactory, with more than half of the teachers as well as students stating that they have all the necessary conditions (57.6% and 63.0% respectively) or almost all the necessary conditions (respectively, 33.3% and 30%) to develop their work remotely. Only one student reported not having the necessary conditions to continue studying in a remote learning modality.

Looking at the results obtained in relation to technological resources, in general, there do not seem to be major limitations. However, a finer analysis of the information reveals some discrepancies (Table 1).

Table 1: Resources & work environment

	Teachers		Students	
	N	%	N	%
Resources				
Unlimited access to the internet at anytime	32	97.0	95	88.0
Conditional access to the Internet	1	3.0	13	12.0
Own computer for exclusive use	30	90.9	87	80.5
Shared computer	3	9.1	18	16.7
Tablet	3	9.1	22	20.3
Smartphone	31	93.9	96	87.1
Microphone	31	93.9	93	89.8
Webcam	31	93.9	97	86.1
Access to online resources	31	93.9	96	88.9
Work environment				
Private workspace	20	60.6	22	20.3
Quiet workspace	24	72.7	74	68.5

Most of the teachers said they have unlimited access to the internet (97.0%) and their own computer for exclusive use (90.9%); other technological resources such as smartphone, webcam and microphone are also available to the vast majority of respondents whether they are teachers or students (Table 1). Considering the quality of their internet connection during videoconference classes, on a scale of 1 to 10 (from lack of quality to very good quality) 45.5% of the teachers rate the quality of their connection as very good and 54.5% as good. It should be noted, however, that as far as students are concerned, the figures are lower than those for teachers in almost all items: unlimited access to the internet (80.5%); a personal computer for their exclusive use (88.0%); webcam (86.1%); microphone (89.8%) and Smartphone (87.1%). While these cannot be considered dramatic results, the need to share a computer (12.0%) and the reference to conditional access to

the Internet (16.7%) as well as difficulties in accessing the internet (17.6% often) indicate different realities among the students that place them in a situation of inequality in accessing quality education.

In terms of the environmental context, conditions worsen for both groups but, again, particularly for students. About 80% of the students cannot work in a private place even though 68.5% of them stated that they have a quiet place to carry out distance learning activities. The overwhelming majority of students were in three-person (35.2%) or four-person (32.4%) households. Some students were also in charge of looking after younger siblings and supporting grandparents during the remote learning period.The well-known implications of the pandemic and the great impact it has on the management of daily routines are especially acute for those who have dependents under their care, namely children, school-age youth, and the elderly. With all schools and support facilities for the elderly closed, and the need for permanent monitoring of children's school activities, the conciliation between family and professional life becomes more complex, contributing to an increase in workload, a fact that was significantly highlighted (by 84.8% of the teachers and by 89.8% of the students). Regarding teachers, 63.7% indicated that they have dependents under their care: aged 12 years or less (36.4%); aged over 12 years (18.2%); and some cases with elderly dependents were also pointed out (9.1%).

As we know (Glass, 2017; Hermann 2013) previous experience in distance education influences teachers' attitudes and their representations about this teaching-learning modality. In the case of the School under analysis, 54.5% of teachers stated that they already had experience in distance education but still 57.6% took the opportunity to participate in training initiatives that particularly focused on: online learning methodologies (50.0%); online assessment (tests, exams, etc.) (39.9%); digital tools (38.9%); Moodle platform (22.2%); others (11.1%), such as cybersecurity, impact of the pandemic on HEI, etc.

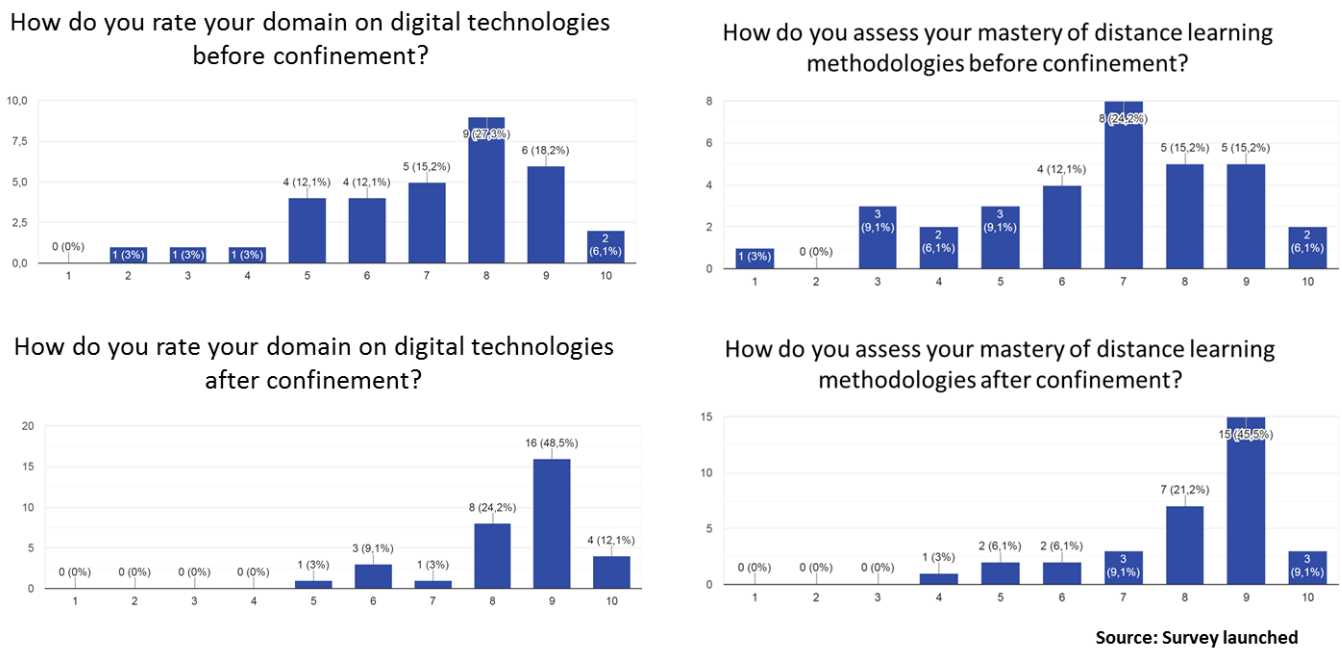

Figure 2: Digital technologies and distance learning methodologies (Teacher’s rate).

Teachers also state that this experience forced by the pandemic, despite implying a considerable increase in workload, has broadened their knowledge about methodologies and digital technologies to support online learning. The results converged with Gonzalez's (2013) perspectives that training should focus more on methodologies and less on digital tools.Overall, teachers' perspectives show that the transition to distance

learning led to many challenges due to an adaptation of procedures, resources, and didactic strategies in a short period of time. However, the experience expanded their knowledge about digital technologies and methodologies to support remote learning (Figure 2). Teachers evaluate positively the evolution of their competences throughout the remote teaching period; both regarding the mastery of digital technologies and teaching methodologies the median increased from 7 to 9, which reveals promising representations regarding the educational modality experienced, for some, for the first time.

Concerning students, 88.0% state that their knowledge of work platforms and tools has improved. However, there are some aspects that deserve better attention. Considering the perception of their own performance and development of competencies, although globally they present a positive self-assessment about the ability to do teamwork (76.0% disagree that this ability has worsened), about the ability to perform autonomous work (74, 9%) and about the development of working methods (67.5% consider that they have developed new working methods and 56.5% consider that they have developed more efficient working methods) it is worth reflecting on the fact that so many students indicated that they had worsened in their ability to do teamwork and also in the development of working methods - which is indicative of the need to train these students in work methodologies (whether distance or face-to-face) carried out in a collaborative way.

In the School of Education, the Moodle platform as a management platform for teaching-learning activities has been used, although not in a generalized way, for about a decade as a support to face-to-face teaching activities. Therefore, there is some knowledge and experience in its use by both teachers and students and it was hoped that in this remote teaching period this pre-existing familiarity could have been harnessed. Thus, the students were questioned about their level of satisfaction regarding the asynchronous activities developed using Moodle, and it was verified that 92.6% evaluated positively the work done (satisfied: 39.8%; very satisfied: 52.8%). Considering the contact with teachers, although the degree of satisfaction of students remains positive (70.4% declared themselves satisfied and very satisfied), it is possible to verify that it decreased in relation to the other indicators evaluated, with students emphasizing, in the open questions, the need for greater feedback in some curricular units in particular, the importance of interaction taking place in an organised and planned way and the importance of information becoming available more promptly.

Also, in relation to the online assessment activities a lower level of student satisfaction is identified. Although 47.2% consider themselves satisfied and 13.9% very satisfied there are 31.4% of students that stated they are dissatisfied and very dissatisfied with online assessment tasks (8 students indicated that online assessment does not apply in their cases). The analysis of the activities on the Moodle platform that teachers identified as taking place in their curricular units shows that only the forum (57.6%) and work/assignment (60.6%) activities are significant - it is not possible to know the pedagogical intention of their use, so we may be only in the presence of a version limited to the dissemination of information in the forums and the submission of papers online. All other activities that the platform allows to develop (wikis, databases, portfolios, glossaries, workshops, H5P, etc.) are mentioned very rarely. As for online assessment, students referred the performance of collaborative activities (48.5%), project work (60.6%), the presentation and discussion of work (57.6%) and the resolution of exercises (39.4%). Again, we were unable to go into the methodologies used in these activities in more detail, but crossing the quantitative and qualitative information and knowing that a decision was made at the top to only allow 25% of the teaching sessions to be held in an asynchronous mode, it is plausible to infer that we are in the presence of synchronous activities carried out through the zoom platform.

When questioned about interaction with their peers, the majority of the students (79.1%) stated that they contacted their colleagues every day or almost every day in the context of school activities, namely to carry out group work; 11.7% indicated that they did so once or twice a week and 9.2% rarely or never.

Like students, teachers also indicated developing joint work with their peers. Many of the learning activities were designed collaboratively, particularly among colleagues sharing course units (78.8%). But there was also interdepartmental articulation (45.5%), with other departments (24.2%) and with other schools (12.1%), reflected in the collaborative construction of educational resources (60.6%). Although we were in confinement, as demonstrated by students and teacher's interaction was possible as well as the development of joint work. These results seem to contradict those achieved by Mansback and Austin (2018) highlighting the feeling of isolation associated with the online teaching modality.

Nevertheless, there were many challenges faced and difficulties to overcome. The main challenges pointed out by teachers and students were grouped into three major categories: 1) related to students' constraints (24%); 2) related to teachers' constraints (58%); and 3) related to the teaching-learning process (100%).

In the first category, teachers highlighted concerns related to students' inadequate technological equipment, Internet access and some situations of digital illiteracy; difficulties in time management, namely in the case of working students, and in reconciling personal and academic life. Social heterogeneity also emerged among the teachers' concerns, with focus on the socio-economic conditions of a group of international students.

The students highlighted practically the same aspects as the teachers, and reported feeling demotivated and having difficulties in concentrating, which impacted on their learning processes.

The second category, regarding teachers´ constraints, the challenge mostly indicated was the workload increase, pointing out difficulties in reconciling work with personal life and, also, the availability of technology resources. There were some statements about the insufficient proficiency in the use of digital tools to support online learning, the negative impact of this transition on the scientific production of teachers and the lack of training in online teaching-learning methodologies and digital assessment tools. These concerns are transversal to both groups surveyed, with students particularly highlighting the need for more training in distance education and assessment for teachers.

In the third category, about the challenges related to the teaching-learning process, the adaptation to new teaching methodologies, the concern with the impossibility of carrying out laboratory and field work and the difficulty in finding alternative ways to replace them, as well as the impossibility of conducting in-person internships were the most relevant aspects pointed out by the teachers. For students, the concern that stood out the most is related to the volume of work requested; mentioned the feeling of lack of guidance and feedback, communication between teachers and students. They highlighted the planning and adaptation of methodologies in the organization of the curricular units.

Nevertheless, several advantages of online education were also recognized. In the first category, related to students, teachers identified online learning as an opportunity to strengthen students' autonomy and involvement; for pedagogical innovation and the development of new learning methodologies. In the teachers' view of the opportunities offered by online learning, the impact at the institutional level was also highlighted. After this experience, teachers showed willingness to adopt distance learning or hybrid (b-learning) in the future and recognized the advantages of diversifying study programs into new learning modalities.

The students highlighted the flexibility of managing time, spaces, and the rhythm of work and learning (favoring reconciliation between different spheres of life). They saw distance learning as an opportunity to expand knowledge of digital tools and to develop new working methods (useful for future professionals).

Concerning themselves (second category), the teachers claim possibilities of training on methodologies in distance education, point out the importance of work and sharing among peers, show willingness to develop and deepen knowledge about distance education and digital tools. In relation to opportunities related to teachers, there is no reference by the inquired students.

With regard to opportunities related to the teaching-learning process, teachers view as positive the possibilities of organizing the teaching-learning processes, enhancing new work methodologies and innovating from a pedagogical point of view, with the creation or adaptation of materials and the production of educational resources, namely audiovisual/multimedia.

As well as teachers, students consider that this modality of teaching can enhance new work methodologies and pedagogical innovation. They also emphasize the opportunity for communication and interaction between teachers and students pointing out the importance of videoconferences to clarify doubts; however, they emphasize the need to change assessment strategies, criteria, and instruments.

4. Conclusions

Although it is obviously that ERT is different from distance education, the crisis-response provided an opportunity for institutions of higher education institutions to rethink innovation processes and invest in online learning (García-Morales et al., 2021). For instance, according to Adedoyin and Soykan (2020), the challenges experienced during the pandemic can be transformed to opportunities through a process of turning face-to-face instructional activities into hybrid models. Finding a balance between online and on-site will be the real strategic challenge for the future (Agasisti & Soncin, 2021; Muthuprasad et al., 2021). Furthermore, this requires a development of an online learning model that can suit all disciplines to solve the problem of compatibility (Agasisti & Soncin, 2021).

Another important concern emerged in this study, like Aguilera-Hermida (2020) and Rospigliosi (2020) pointed out that, alongside with a range of opportunities created by these pandemic major risks may be widespread, if the experience was negative stakeholders could be mistakenly confused with distance education what can undermine the adoption of online learning in the future. One evidence of that is the reproduction of traditional methodologies using synchronous/real-time online classes and video lectures (Rospigliosi, 2020). Hence this study can bring some important insights to reimagine and redesign the higher education innovation process towards an appropriate view of digital learning and to overcome the identified barriers.

We agree with Eradze et al. (2021), when they state that the pandemic situation led to an experience on a global scale, in different contexts, leading to a "forced digitization". It happened because of a public health issue, therefore without diagnosis, planning or evaluation (namely ex-ante) as the implementation of any development project would require; the now so fashionable pedagogical innovation that considers the inclusion of technological resources and the development of teaching modalities, unloved until just over a year ago, emerging in a forced or even imposed way, cannot evade the need to go beyond the use, even if adequate, of technologies without being structured in pedagogical models that are well conceived and adequate to the

reality and contexts of different higher education institutions, responding to the needs of the various partners and audiences they serve. Returning to Eradze et al. (2021), it is a question of reorganizing teaching and learning activities, as the use of new tools introduces such a need, having demonstrated the potential of educational technologies. For the authors, educational innovation corresponds to a transformative process of education itself, re-imagining practices, but not being misunderstood with technological innovation - although in articulation, they are not the same thing.

Previous research (Aguilera-Hermida, 2020; Yang & Huang, 2021) highlighted that raised proficiency in online learning through the pandemic experience had a significant impact on attitude toward distance education and pedagogical innovation. However, for these gains to be sustainable it is crucial to build a training system for teachers. As Ali stated (2020) to establish an online learning environment it is not only necessary to overcome time constraints and technical problems, it requires a solid preparation of teaching materials and curriculum and assessment knowledge. Thus, in our Institution a large project with public funding is under development, with the aim of, among other things, developing digital inclusion capabilities in the business areas of the Polytechnic Institute. To prepare the academic community for future challenges in times of uncertainty, the Institution is already on its way investing in training its community and being aware that the educative offer in a distance modality implies expanding support teams, both in the development of educational resources, in the development of LMS ecosystems and in their interoperability with other academic services.

According to Mackey et al. (2012), promoting the adaptation of face-to-face teaching in times of crisis is essential to strengthen communication channels between students and teachers; prepare teachers to use distance methodologies; prepare students to work independently and at a distance; and ensure technological resources gained and in different formats. These are also conclusions drawn from the analysis carried out on the information collected through the application of two questionnaires to higher education teachers and students from a Portuguese Higher Education Institution. Although, globally, significant aspects were pointed out in the development of skills and abilities to work remotely and that a set of indicators were positively evaluated, less successful aspects were also identified that should constitute a matter for in-depth reflection in the context of the institution.

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Strategies to counter and prevent online hate speech. A proposal for future teachers and educators

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Abstract

Issues around hate speech online have gained increasing prominence on the national and international debate (UNESCO, 2015; EC, 2016; IRPA, 2021) and attract public attention to develop possible action strategies to counter and prevent the phenomenon. The lack of educational strategies aimed at promoting a sense of responsibility, empathy, active listening, and respect emerges across the board. It stressed the importance of education in undermining the misconceptions and misinformation that form the basis of hate speech and of the need for such education to be directed to young people (ECRI, 2015).

On this perspective, the paper describes the results of a pilot analysis on the topic of hate speech online carried out with future teachers and future educators within the didactic laboratory of the degree program in 'Scienze della Formazione Primaria' (LM-85 bis) and 'Scienze dell'Educazione e Formazione' (L19) at the University of Bari Aldo Moro. This analysis aims to investigate the perception of students about their awareness of virtual language habits, their knowledge of tools for reporting inappropriate content provided by social platforms, and more generally, their representations of hate speech online.

Keywords: online hate speech; prevent and countering; human rights education; EDU; social networks;

Introduction

Hate isn't a new phenomenon. The global spread of the Internet has provided it with new meanings and forms of dissemination, the inception of more innovative tools, such as social media platforms, has given rise to new challenges and concerns regarding online hate (Gagliardone, Gal, Alves, & Martinez, 2015). Online hateful content, or Online Hate Speech (HSo), is characterized by some key aspects (such as virality, or presumed anonymity) which distinguish it from offline communication and make it more dangerous and hurtful (Ziccardi, 2016; Poletto, Stranisci, & al., 2017). Discrimination, online and offline, remains a daily reality for many people in the EU despite 20 years of EU equality legislation.

During the pandemic period, intolerance towards ethnic, religious, cultural minorities and people belonging to the LGBTQA+ community increased. The "*Rising Levels of Hate Speech & Online Toxicity During This Time of Crisis*" report, edited by L1ght AI-based startup, reveals a worrying rise in online toxicity and cyberbullying among children, precisely when they are most reliant on digital platforms. According to the data, an increase of 900% in hate speech on Twitter was directed towards China and the Chinese. Explicit language to accuse Asians of carrying and spreading the coronavirus is used in toxic tweets and inflammatory hashtags. Along with the general increase in internet traffic, L1ght found that traffic on known hate sites increased by 200%, also more children used online platforms to socialize during their quarantine and social detachment; through social

media communication channels and popular chat forums, a 70% increase in instances of hate speech among children and teenagers was identified[1].

Italian data are not encouraging too. The fifth edition of the Map of Intolerance[2] (VOX, 2020) has detected and geolocalized hostile tweets with the aim of identifying the areas where intolerance is most widespread. Six target groups are found: women, homosexuals, migrants, people with disabilities, Jews, and Muslims. The Map of Intolerance highlights, as is already known, the catalytic power of social media. They become a privileged vehicle for incitement to intolerance and hatred towards minority groups, stressed by an increasingly significant correlation between the use of a certain type of language and the presence of episodes of violence in real life, linked to this combining of dangerous like-minded users, earlier studies indicate that hate groups have been actively working to recruit young people through information technologies[3] (Keipi, Näsi, Oksanen, & Räsänen, 2016; Lee & Leets, 2002). During the pandemic period, increased anxieties, fears, and difficulties contributed to the polarisation and radicalization of virtual conflicts. Although the Map of Intolerance reveals a significant decrease in negative tweets compared to the total number, it indicates a different scenario and a change in progress compared to previous years: the detection of peaks of hatred, for example, indicates a significant recrudescence and fury (also detected by the number of tweets) that would seem to highlight a different use of social networks. A use, almost more 'professional', where circles and groups of haters concentrate the production and diffusion of hate speech. It is a polarisation that 'justifies' an aggressiveness capable of networking, where the target is perceived as the generic element of a narrative, a dehumanized subject. Online aggression is increasingly normalized, less hindered by social stigma (Faloppa, 2020a). Women and migrants are most hated, namely the most exposed social groups to the changes and adaptations needed to overcome the current pandemic crisis (VOX, 2020). Intolerance and hostility can arise precisely from seeing - negatively exaggerating - the affinities of one's own group with the distance from others. In this way ethnocentrism, the (almost natural) tendency to observe and interpret the world from the point of view of one's group, becomes an opportunity for conflict (Pasta, 2020). This is a worrying landscape because more deeply rooted hatred is the trigger for different and more organized forms of extremism[4].

Another national monitoring of HSo is the Hate Barometer report[5] (Amnesty, 2021). The study was conducted in the 16 weeks between June and September 2020. 22 million contents were collected from Facebook and Twitter. The hate barometer measures the impact that the repercussions of the pandemic on economic, social, and cultural rights have had on online discrimination. The study found that at least 1 comment in 10 is offensive, discriminatory, and/or hate speech, while hate speech itself increased by 40%. It is a hatred that

[1] Retrieved October 3, 2021: https://l1ght.com/Toxicity_during_coronavirus_Report-L1ght.pdf

[2] The project created by Vox – Osservatorio Italiano sui Diritti in collaboration with the University of Milan, the University of Bari Aldo Moro, University of Rome, and IT'STIME of the University of Milan. Retrieved October 3, 2021 http://www.voxdiritti.it/la-nuova-mappa-dellintolleranza-5/

[3] There are several studies showing a direct correlation between an increase in virtual hate content and real-life violence. One of the most convincing examples comes from Germany. The paper presented by Karsten Müller and Carlo Schwarz at the Royal Economic Society annual conference in Warwick in April, finds that there is a high correlation between anti-refugee sentiments on social media and real-life actions. The study on anti-refugee violence between 2015 and 2017 found a correlation between an increase in the number of Facebook posts expressing anti-migrant sentiments and an increase in anti-refugee incidents (mainly violent crimes). What makes this study unique is the clear evidence showing that "when people in places that usually see more anti-refugee attacks have limited access to the [Facebook] platform, due to internet outages or service disruptions, violence decreases sharply." The results suggest that social media can act as a propagation mechanism for violent crimes by enabling the spread of extreme viewpoints (Müller & Schwarz, 2020).

[4] In add, the extent of the problem is demonstrating by other data too: in 2019, Facebook announced the removal of 7 million instances of hate speech in the third quarter only, in increase of 59% against the previous quarter. This has been done in 80% of the cases with the support of artificial intelligence. Retrieved October 6, 2021: https://time.com/5739688/facebook-hate-speech-languages/

[5] Retrieved October 3, 2021: https://www.amnesty.it/barometro-dellodio-intolleranza-pandemica/

strikes across the board: sexist, homobitransphobic, racist and xenophobic, Islamophobic, anti-Semitic, anti-Gypsy, classist. The trap of "*us against them*" is increasingly dangerous. From the first major online hate site, Stormfront.com[6], founded in 1995 (Gerstenfeld, Grant, & Chiang, 2003), with many prominent hate groups also going online during the 1990s, social media continue to play a significant role in bringing like-minded people together in the context of negative or risky behavior (Keipi, Näsi, Oksanen, & Räsänen, 2016; Müller & Schwarz, 2020).

1. The first difficulty: defining Online Hate Speech

The scenario already presented leaves a great many questions unanswered and raises new ones. How to counter the phenomenon? How to prevent it? How to recognize HSo and distinguish it from criticism? Are there differences between the various forms of HS? What educational strategies should be pursued to prevent the phenomenon?

The first difficulty to combat and/or prevent the phenomenon is to define exactly what is meant by online hate speech (Weston-Scheuber, 2012). Traditional legislation, developed for other media, is either ineffective or inappropriate: the impossibility of total control of the virtual content published, its rapid and spotty spread, the barriers of anonymity, and the consequent lack of responsibility for virtual actions constitute a very complex scenario.

Numerous definitions of hate speech in its traditional sense have emerged in the framework of European and international law. However, the disparity of approaches hinders the achievement of a uniform and coherent legal framework (Casarosa, 2020). How online hate functions today is a product of both user intent and the mechanisms available for making that content available. Online, users can express themselves to a potentially global audience in ways that were not possible before (Benesch, 2014). The matching of user intent with the tools available for disseminating content can result in wide-reaching effects. An understanding of hateful intent and methods of how that intent can be delivered, requires a contextual look at the users themselves through approved theoretical frameworks used in past research of the offline setting especially (Keipi, Näsi, Oksanen, & Räsänen, 2016). For these reasons, it is essential to start by analyzing the phenomenon in its offline sense.

Hate speech - in its traditional meaning referring to offline hate - is a particular form of offensive language that makes use of stereotypes to express a hate ideology. The Encyclopaedia of the American Constitution defines HS as "*communication that denigrates a person or group based on characteristics such as race, color, ethnicity, gender, sexual orientation, nationality, religion, or other*" (Nockleby, 2000). More generally, hate has also been defined *as extreme dislike of a person or group of people* because of their race, ethnicity, religion, gender, or orientation (Waltman & Mattheis, 2017; Waltman & Haas, 2011). In add, research reveals how hate speech is a discourse designed to draw attention to and manipulate social differences (Waltman, 2015). Indeed, hate speech discursively constructs the in-group in highly positive terms, while it constructs the out-group in dehumanized terms, characterizing the out-group as a threat to the in-group and the values and traditions cherished by the in-group (Waldron, 2012). Hate speech can serve a variety of different social and political purposes; i.e., hate speech can serve the simple purpose of intimidating those who belong to an out-group

[6] White nationalist and former Ku Klux Klan member, Donald Black, launched the first extremist website, stormfront.org, in April 1995. Since then the number of hate sites has ballooned. Early attempts at quantification suggested that 'Hi-Tech Hate' was spreading rapidly. Stormfront website's four branch operators in Italy were sentenced to imprisonment for instigation to racial hatred, praise of neo-Nazism and defamatory messages. In correlation with this procedure, 24 other persons were convicted to a prison (between 1 year and 3 year and 10 months) for hate crime, and racial and aggravated defamation.

because of their race, ethnicity, religion, gender, gender identity, or sexual orientation (Waltman & Mattheis, Understanding hate speech, 2017; Udupa, Gagliardone, Deem, & Csuka, 2020). Typically, the targets of hate speech belong to a social group that has a history of oppression, making them particularly vulnerable to intimidation through hate speech (Álvarez-Benjumea & Winter, 2018), causing loss of self-esteem, anger, isolation, constant and unmotivated defensive attitude (Ziccardi, 2016). Waltman e Mattheis (2017) add two other specific features of hate speech (that also apply to HSo): HS is used to construct a collective form of memory for the in-group (Waltman & Haas, 2011; Waltman, 2015). This collective memory consists of the beliefs that group members share through their hate speech. Furthermore, hate speech is used to recruit and socialize new members into groups who make hate a primary purpose of their being (Waltman & Haas, The communication of hate, 2011) namely, in the virtual context, hate groups, or virtual eco-chambers. In summary, hate speech both reinforces the boundaries between groups and is harmful to members of the other group, either in itself or in its effects (Kojan, Osmanbeyoglu, Burbach, Ziefle, & Calero, 2020). With millions reached in seconds, the Internet offers a social network that enables previously diverse and fragmented groups to connect, engendering a collective identity and sense of community (Banks, 2011). By sharing stories, jokes, and books with each other, hate groups use hate speech to instill in their members the appropriate beliefs to be part of the group. However, HSo is a complex phenomenon with its definition depending on theoretical paradigms, disciplines, and forms of victimization. Due to this complexity, online hate research (OHR) is a fragmented field with a growing number of research papers across disciplines, as the adverse effects of online hate are more widely recognized in society and as new disciplines (e.g., computer science) are introducing their approaches to study and solve the associated problems (Waqas, Salminen, Jung, Almerekhi, & Jansen, 2019); what is evident is that the concept of "online hate speech" is constantly evolving.

2. The second difficulty: strategies to counter and prevent

Combined with the difficulty of finding an unambiguous definition that encloses the complexity and facets of the phenomenon, there is the difficulty of finding valid strategies to counter and prevent HSo. In her literature review on how to counter online hate speech, Buerger (2019; 2021) defines some salient points:

a) internet users do take cues from others, for good and for ill; people exposed to civil comments are more likely to write a civil comment themselves (Han & Brazeal, 2015);
b) discourse norms established or reaffirmed by members of a group can have an impact on the quality of online discourse (Frieß, Ziegele, & Heinbach, 2020);
c) responding directly to the hate content is not effective in stopping the behavior (i.e., posting hateful content) of the original speaker, but it is a useful way to reach a wider audience and invite more counterparts. Positive comments encourage other participants with a positive attitude to get involved (Miškolci, Kováčová, & Rigová, 2020);
d) counterspeech can influence the original speaker, although the effectiveness of a counterspeech interaction depends on the proportionate size of the group of hateful speakers in a particular online space. The message is more effective when counter speakers greatly outnumbered those sharing hateful messages (Schieb & Preuss, 2016);
e) both negative mood and seeing troll posts by others significantly increases the probability of a user trolling (Cheng, Bernstein, Danescu-Niculescu-Mizil, & Leskovec, 2017);
f) counter speech from users who are perceived as more influential can curb hate speech at least temporarily (Munger, 2017).

UNESCO has also published a comprehensive overview of the international legislative actions that addressed online hate speech and also the social responses by the IT industry. The report emphasis on civil society and social steps, rather than state-initiated legal measures. The study stresses that solving the problem on a legal ground would not tackle its root causes. Hate speech is often the expression of deep tensions and inequalities within society, therefore a proper comprehension of the problem is fundamental in addition to interventions in society (Gagliardone, Gal, Alves, & Martinez, 2015).
In the same vein, the European Commission against Racism and Intolerance (ECRI) released a general policy recommendation on combating the expression of hate in any medium from the written or spoken word to cultural products such as paintings, music, or videos (2016). Their sixty-six-page report includes guidelines on how to prevent the expression of hate and how to counter it:

> *"[…] stressing the importance of education in undermining the misconceptions and misinformation that form the basis of hate speech and of the need for such education to be directed in particular to the young"*

Furthermore, The Council of Europe is working to raise awareness of online hate speech with the *Young People Combating Hate Speech Online campaign*. Launched in 2013 at the national and local levels through national campaigns in 45 countries, the movement will remain active beyond 2017 through the work of various national campaigns, online activists, and partners[7]. Hate speech covers the importance of educating people to Human Rights, in agreement with the Secretary-General of the Council of Europe: "*It is not enough for children and young people simply to hold human rights. To embed a human rights culture and ensure that our young people understand how to access those rights – and to uphold, defend and promote them – they need an education fit for that purpose. [...] It is vitally important that young people get the chance to see life through this lens*"[8].
Among the different resources offered by the Council to promote human rights education as a privileged strategy to counter and prevent online hate speech, this paper presents the human rights workshop at the University of Bari which was designed based on two resources offered by the Council:

a) *Compass. Manual for Human Rights Education with Young People* (Brander, Keen, & Lemineur, 2002; 2012) Reference manual for many people involved in value-based youth work and non-formal education, it is currently available in more than 30 languages, Compass and its publication in various language versions has been the medium through which human rights education has been brought onto the agenda of youth work and into the curricula of many schools.

b) *Bookmarks. Manual for combating hate speech through human rights education* (Keen, Georgescu, & Gomes, 2016; 2020) It was specifically created to support the No Hate Speech Movement. The manual presents activities designed for young people aged 13 to 18, but which are adaptable to other age groups, and it's useful for educators working to address this problem, both inside and outside the formal education system.

3. The Human Rights workshop in Uniba

The workshop considered as the elective mediator of the transmission of knowledge to the student for the reflexivity, research, action, and creativity that characterize it (Perla, 2015) seemed to us to be the best choice to create a peaceful climate of sharing, reflection, and learning. Moreover, effective training should be based

[7] More information is available: https://www.coe.int/en/web/no-hate-campaign
[8] This is an excerpt from Compass introdution retrieved from: https://www.coe.int/en/web/compass

on devices that allow the recovery of experience and the activation of a post-reflection on it (Perla, 2019); indeed, the workshop does not aim at acquiring mere operational skills but a merging declarative and procedural knowledge, transforming them into smart skills (Bertagna, 2012). This is the final aim of the workshop and what we hope for the students of the course, especially for students on university teaching courses to train future teachers, and future educators.
The methodological research protocol was established according to the Experiential Learning approach[9] (Kolb, 1984) with the integration of point "*Taking action*" adopted by Brander et al. (2012, p. 33) (see Fig.1).

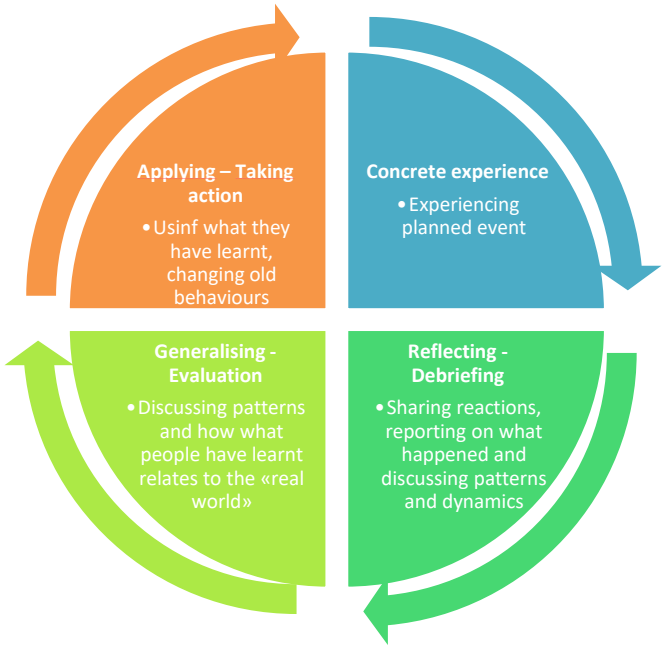

Figure 1: Adapted from Kolb's Experiential Learning Cycle (1984) and Compass (Brander, 2012)

All the activities are built on this model and they have been designed to help future teachers and educators develop the knowledge, skills, and attitudes that will be needed the Internet is to reflect the fundamental principles that have been established for the real world (Brander, 2012). The project lasted 2 months and it was carried out in 5 modules:

- I module: *What is online hate speech? Does it exist?*
- II module: *How to recognize online hate speech?*
- III module: *How to counter online hate speech?*
- IV module: *Human Rights Education*
- V module: *Acting and share!*

An overarching goal of this workshop is to think about what type of teachers or educators they envision themselves to be and to experience what it means to design consistent with the working of the 'destination' context (Perla, 2015). The readings, project work, case studies, writing activities, and discussions are designed

[9] There is a wide range of pedagogical literature on this field, including some of the greatest: Jonh Dewey in *Experience and education* (1938), Piaget in *La psicologia dell'intelligenza* (1999) and many others that it would be reductive to mention here.

to help participants select theories or approaches to teaching that resonates with them at this early stage of their teaching development (Perla, 2020). Each activity description includes suggestions and questions to guide the debriefing and discussion to help students reflect on what happened, how they felt about the experience, and how the experience compares with what they already know and relates to the wider world. Finally, students move on to phase 4, that of applying, of putting their learning into practice (Brander, 2012, p. 32)in particular with a curriculum project for children based on Human Rights Education. One of the highlights of the workshop was the focus on group work that characterized all working sessions, i.g. figure 2 shows the Teams channel screen, with sub-channels for micro-groups and the general channel for collective discussion.

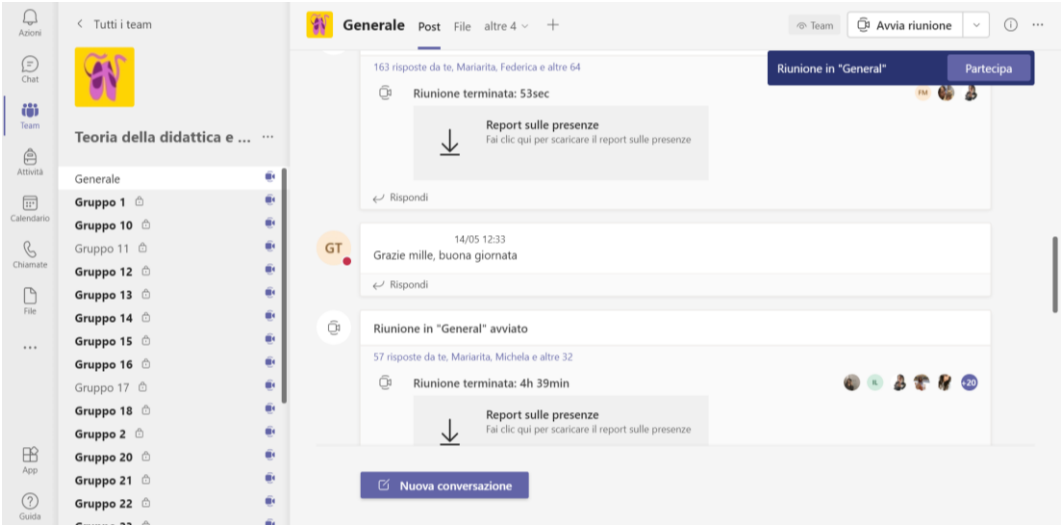

Figure 2: Example of remote group interface in Microsoft Teams channel

Another element is the debriefing activities supported by the Google Jamboard application (e.g., post-its with stimulus questions, highlights for sharing). The Jamboard was accessed by all students, whiteboards were created for each micro-group, and a general whiteboard was created for collective debriefing with a moderator chosen by the groups.

The working method chosen took into account the recursive logic of the triangulation both for the data collection tools: CAWI surveys addressed to students (in the pre-post of each session), focus groups and narratives; but also, for the human resources involved: supervision of the Didasco (Didattiche Scolastiche)[10] research group, the president of the No Hate Speech Movement Italy Dr. Debora Barletta, and the undersigned PhD student.

3.1 The exploratory research

195 students from the first year of the degree course in "Scienze della Formazione Primaria" (LM-85 bis) and 205 students from the second year of "Scienze dell'Educazione e della Formazione" (L-19) of University of Bari Aldo Moro took part (a total of 400 students). The exploratory research study conducted in the initial phase of the workshop provided the representation of the students' understanding of the phenomenon of online hate speech. The study has been carried out by submitting a 30-question questionnaire including multiple choice and open questions. The CAWI survey was divided into three main parts:

[10] DidaSco (Didattiche Scolastiche) is a research group set up on the initiative of Loredana Perla in June 2010 at the then Department of Pedagogical and Educational Sciences of the University of Bari Aldo Moro with the aim of developing research-training proposals in response to the needs emerging in the Puglia region (and beyond) in response to the needs emerging from the Puglia region (and beyond).

- group personal data and most used social media;
- representation of HSo, in which is possible to understand student' representations about the phenomenon and their previous knowledge. In particular, the main areas:
    - knowledge of the phenomenon in real life;
    - knowledge of the phenomenon in virtual life;
    - channels of transmission of HSo;
    - direct or indirect experiences;
- Signalling systems for inappropriate content.

Of this group, 30% said they had previous experience in education, although the average age is 42% between 19-20 years, 35% between 21-25 years, 11% between 31-40 years, 8% between 26-30 years and the remaining 4% over 40 years.
The sample states that Instagram is the most used social network (in the three top it is the first one chosen with 92%, followed Facebook with 75%, Telegram with 46%) and it is also the social network that contains the most hate content, 77% of the sample claimed to have met HSO on Instagram and 58% on Facebook. Only 44% of students who encountered hate content reported on the platform, the remainder exclusively unfollowed the hate author (27%) or ignored (17% of respondents). Only 5% claimed to have commented to understand the motivations for inciting hatred but to no avail, and 3% clicked dislike.
Likert scale questions were used to investigate the virtual habits and sensitivity of the sample to the hot topics of HSo. The sample declares a high level of attention for the language used, slightly higher for own virtual actions.

	Arithmetic Mean	Mode	St. var.
15. Beware of personal language used on social network	4,44963	5	0,733887066
16. Beware of "influencer" language used on social network	4,195378	5	0,916009
17. Beware of the language of people close to you on social network	4,239696	5	0,830134

However, these data are slightly at odds with the analysis of the answers to question no. 18, 30% of the sample stated that they had never thought about the importance of language on social networks:

18. Have you ever thought about the importance of language on social networks?		
Yes	271	68%
No	129	32%

A strong harmony of response is about the importance of education in the correct use of social media, with a slightly less cohesive distribution about awareness of own digital impact. 74% of the sample stated that they had never participated in training sessions on the proper use of social media and showed interest in doing so (for 98% of the 74% responding "never participated").

	Arithmetic Mean	Mode	St. var.
20. How important do you think it is to educate people to use social media correctly?	4,87	5	0,372083
21. How aware do you feel you are of the impact of your virtual actions?	4,433138	5	0,742376

4. Conclusions

As is known, the worrying growth of the HSo phenomenon cannot be ignored. It is evident how important it is to invest in prevention and therefore in education. Hate speech has become one of the most common forms of intolerance and xenophobia in Europe today and education is the only long-term solution. Only very few students have received adequate training in the use of social networks or virtual language. This is why it is so urgent to try to close this gap. Starting with future teachers and educators could be a valid strategy to facilitate both the future population of teachers and to indirectly reach the virtual citizens of tomorrow. The real turning point is educational prevention, which can start with training and awareness-raising of school staff, in parallel we need to work with youth mobilisation to combat hate speech and promote human rights online.

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Understanding the online professional networking behaviour of international business students using LinkedIn

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Abstract
Many studies have demonstrated the importance of networking for study success and professional careers. In the context of business school, a professional network is essential for students' study success. That is why it is gaining a more prominent place in business school curricula as part of students' professional development. However, few studies have specifically investigated students' professional networks; most studies of students' networks focus on family and social networks.

This study investigates students' professional networks by analysing their use of LinkedIn. It is based on a survey of students (n=271) at an international business school in the Netherlands. 80% of those students have an active LinkedIn account, but most of them rarely check their account and most spend less than 10 minutes a week on LinkedIn. Several factors play significant roles in explaining students' behaviour on LinkedIn: study year, personality traits and international background. These results can be used to help design training to develop students' online networking skills.

Keywords: LinkedIn, international students, big five, personality traits, social media, Social Networking sitesIntroduction

The online platform LinkedIn has become an important professional networking site for students in higher education. Established in 2003, LinkedIn is the biggest online platform for professionals in the world: it has 756 million users from more than 200 countries (Cho & Lam, 2020). The platform allows members to make an online profile, connect with others and communicate with them. As Florenthal (2015) explains: 'To cater exclusively to professionals, it enables users to search for employment opportunities, research companies and industries, include résumé information in their profiles and give or receive recommendations' (Florenthal, 2015).

It is estimated that around 20% of LinkedIn users are between 18 and 24 years old (Simon, 2020). Because most university students fall within this age range, this figure may suggest the number of members that are students. The Covid-19 pandemic has increased student engagement with LinkedIn because offline networking activities could not be conducted. Data from the US show that undergraduate students made more connections on LinkedIn in 2020 than in 2019 (n/a, 2021).

Both educators and researchers have recognised the value of this online professional platform for university students. This is apparent in the emergence of literature that provides practical guidance for lecturers about how to use LinkedIn as part of the curriculum (Albrecht, 2011; Mogaji, 2019; Peterson & Dover, 2014). According to Peterson and Dover (2014), professional networks help educate students who hold uninformed

views of the workforce they are about to join. Carmack and Heiss (2018) agree: 'Knowing how to build professional networks online is particularly important for college students and graduates, as many internships and jobs are obtained through professional networking' (Carmack & Heiss, 2018). Furthermore, Van Dijck (2013) argues that university students who demonstrate social skills on LinkedIn increase their professional value on the job market. Given the value of LinkedIn for students' professional development, it is important to understand how students use this online platform so that educators can design a learning programme to help students use it effectively.

Relatively few studies have investigated students' use of LinkedIn; more studies have looked at students' use of other popular social media platforms, such as Facebook. The studies that have looked at students' LinkedIn use have investigated their behaviour, such as frequency and time spent on the platform, and their intentions and motivations for using LinkedIn (Carmack & Heiss, 2018; Florenthal, 2015). However, these studies have not strongly considered students' backgrounds in their analysis. Literature about students' social capital shows that students' personality traits and backgrounds (e.g., international experiences) play a role in shaping students' friendship networks. Only a few studies have looked at the extent to which these backgrounds also play a role in explaining students' use of and behaviour on LinkedIn. In this paper, we aim to fill in this gap by analysing factors that shape the use of LinkedIn in an undergraduate international business programme in the Netherlands.

1. Literature review & research questions

Empirical studies on students' use of LinkedIn mostly come from the context of universities in the USA. In this paper, we analyse a population of students in the Netherlands, a country that had 4.7 million LinkedIn users in 2020 (Cho & Lam, 2020). Considering the differences between the higher education systems in the Netherlands and the USA, it might be interesting to investigate whether there are differences in students' behaviour on LinkedIn. Our paper also looks at an international programme in which the student population comes from various countries. Previous studies on students' use of LinkedIn did not consider international differences, even though the increasing numbers of international programmes at universities in Western countries mean that educators work with a heterogenous student population. Global trends in international student mobility and the perceived value of studying abroad in preparation for employability and work in a globalised labour market have drawn increasing attention to the formation and impact of international student networks as valuable sources of social capital (Moon & Shin, 2019). Understanding the role of international aspects in shaping students' behaviour on LinkedIn could help educators design a suitable learning programme for students in an international programme.

2.1 Students' behaviour on LinkedIn

Studies that look at students' use of social network sites have found that students are less likely to use LinkedIn than other platforms, such as Facebook or Twitter. Studies that investigate students' use of LinkedIn have looked at students' attitudes, intentions and behaviours, including the frequencies and the time that students spend on LinkedIn. For instance, Carmack and Heiss (2018) studied students' use of LinkedIn at two universities in the USA and found that 'students are infrequent users of LinkedIn, and when they do use it, most engage in passive activities'. Florenthal (2015) differentiates between 'light' and 'heavy' LinkedIn users by looking at the frequencies with which students take various actions on LinkedIn, such as accessing the account, updating their profile, posting information and interacting with their connections.

RQ1: How do international business students use LinkedIn?

2.2 Influential factors that affect students' networking behaviour on LinkedIn

In this study, we aim to identify factors that influence students' behaviour on LinkedIn. Previous studies have found that several important factors play a role in explaining students' use of LinkedIn. Carmack and Heiss (2018) applied the theory of planned behaviour and found that 'parents and friends (subjective norms), attitudes, and past use of LinkedIn were significantly related to students' future intention to use LinkedIn' (p. 155). They found that students primarily see LinkedIn as a platform for networking, job and internship searches, and professional development. Florenthal (2015) applied used and gratification theories to identify students' motivations and found four uses and gratifications categories that explain why university students would be willing to use LinkedIn: 'interpersonal communication', 'information', 'online identity' and 'career advancement'. Florenthal (2015) also found that students want to use LinkedIn to network with co-workers and peers, usually to learn about career-related opportunities.

RQ2: What motivates international business students to use LinkedIn?

2.3 Personality

Social media represent a limitless source of data to analyse, which can lead to a deeper understanding of consumers' choices, lifestyles, intentions and sentiments (Misirlis & Vlachopoulou, 2019). Many theories have been used to explain users' online behaviour in combination with their personality traits. A plethora of researchers have focused on personality analysis, based on specific trait models (Gosling, Gaddis, & Vazire, 2007; Hall & Pennington, 2013).

One of the most frequently used is the Big Five model. The Big Five taxonomy represents one of the most reliable methods for exporting and monitoring personalities (Hatzithomas, Misirlis, Boutsouki, & Vlachopoulou, 2017; McCrae & John, 1992; Ryan & Xenos, 2011; Zywica & Danowski, 2008). Davis, Wolff, Forret, and Sullivan (2020) used this model to investigate the use of LinkedIn by graduate students. They found that 'extraversion and a protean career orientation significantly predicted networking ability, which in turn predicted both the number of contacts on LinkedIn and the frequency of LinkedIn usage' (p. 1).

Although it is the biggest professional online network platform, LinkedIn presents a series of difficulties to personality prediction. Users avoid sharing personal information there since they are afraid that recruiters might have access to it, and they avoid revealing aspects of their personal life that could interfere with (Back et al., 2010; Roulin & Bangerter, 2013; Stoughton, Thompson, & Meade, 2013). This limits the amount of research that can be conducted on LinkedIn about personality prediction and associations with aspects of the platform's use.

RQ3: What is the role of personality traits in explaining international business students' behaviour on LinkedIn?

2.4 International background

Since we are analysing an international programme with students from different countries, it is important to identify the role of international backgrounds in students' formation of social networks. Studies on students' use of LinkedIn have not included international factors in the analysis. However, studies of international students' social networks have shown that the students' international backgrounds play a role in shaping their social networks. For instance, Rienties, Johan, and Jindal-Snape (2015) found different patterns of social formations between students from different countries who were studying in the UK. Moon and Shin (2019) looked at social network formation by students from Asian countries at a university in Japan and found that

language and institutional barriers influence the formation of social ties with local and diverse multinational international students. Furthermore, in their qualitative study of a multinational group of students at a university in the UK, Taha and Cox (2016) concluded that these students form both work (study-related) and friendship networks and that these networks evolve differently over time depending on factors such as relationships with students from one's own country and other nationalities, language, experience with discrimination and negative stereotypes, age, time (study period) and working orientation. Finally, with regard to the use of online media platforms, Chang and Gomes (2017) reviewed literature on the use of social networking sites by international students and found that 'there is evidence that international students use various forms of social media and rely on a range of sources for information that is different from domestic students' (p. 349).

RQ4: What is the role of international experiences in explaining students' behaviour on LinkedIn?

2. Methodology

A total of 271 students participated in this study in the spring 2021 semester. All students were enrolled in an international school of business at a university of applied sciences in the Netherlands that consists of three groups: communication (65%), international business (31%) and exchange programme students (4%). The students were in different years of study: 29% in their first year, 29% in their second year, 22% in their third year and 20% in their fourth year. The students came from 45 countries, with the largest percentage from the Netherlands (44%), followed by Vietnam (15%).

3.1 Survey protocol

The online survey consisted of 19 questions to assess three variables and gather demographic information.

Variable 1: LinkedIn use

This variable measured students' use of LinkedIn. Students were asked about how frequently they use LinkedIn (how often they check the account and how much time they spend there). Other indicators used to measure Variable 1 are the students' purpose in using LinkedIn, the criteria they use to make connections and how they make new connections.

Variable 2: International backgrounds

Following Levy, Peiperl, and Bouquet (2013), we propose several indicators of international aspects. These include 'international work experience' (including internship programmes abroad) and 'living and studying abroad' (including exchange programme abroad). We further specified these indicators based on the context of our respondents as follows: study abroad, exchange programme abroad, internship abroad, work experience abroad, living abroad, working in an international company (serving an international market, colleagues from different countries), and participating in online activities (study or work projects, courses, volunteer projects) with participants from different countries. The survey defined 'abroad' as 'outside your country of origin'.

Variable 3: Personality traits

Questions related to this variable were developed based on the 10-item scale for the Big Five model of personalities. This is based on a five-axis model consisting of: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (O. John, L. Naumann, & C. Soto, 2008). The following table represents the conceptual definition of the Big Five model.

Table 1: Conceptual definitions from the Big Five model

Research variable	Conceptual description	References
Openness (O)	Openness measures peoples' originality and open-mindedness. Openness to new experiences describes how original or complex an individual is in their life.	Choi & Shin (2017); Čukić and Bates (2014); D.-H. Choi and Shin (2017); Liu and Campbell (2017)
Conscientiousness (C)	Conscientiousness measures the constraint and control of impulses (e.g. thinking before acting, delaying gratification, following rules and being organised).	J. Choi and Kim (2014); Nadkarni and Hofmann (2012); Seidman (2014)
Extraversion (E)	Extraversion measures a person's energy and enthusiasm. Extraverted individuals usually have a positive way of thinking.	Augustine and Hemenover (2008)
Agreeableness (A)	Agreeableness measures a person's altruism and affection. Agreeableness may also refer to individuals who seek information on the internet.	J. Choi and Kim (2014); Nadkarni and Hofmann (2012); Seidman (2013)
Neuroticism (N)	Neuroticism measures a person's negative emotionality and nervousness. Neurotic individuals often hide some aspects of themselves, but they show them only online.	John, L. Naumann, and C. Soto (2008); Smith, Saklofske, and Nordstokke (2014)

In addition to questions related to the above variables, students were asked demographic questions (including age, country of origin, nationality, class rank and study programme). They were also asked demographic questions about their current work and whether they use online professional platforms other than LinkedIn.

3. Results

Data were analysed using the Statistical Package for the Social Sciences (SPSS 25.0). The results are presented below based on the research questions formulated in section 2.

4.1 RQ1: How do international business students use LinkedIn?

85 out of 249 students (31.4%) indicated that they check their profile very rarely (less than once per week). This was the highest percentage on the frequency table (Table 2). The rest of the categories were relatively equally distributed.

Table 1: Profile check frequency

Profile check frequency	Frequency	Percentage (%)

very rarely (less than once per week)	85	34.1
once per day	53	21.2
several times per week	40	16
several times per day	38	15.2
once per week	33	13.2
Total	249	100

The reliability of the aforementioned result can be reinforced by the time-spent variable, which indicates that 86.6% of students have a low level of involvement with LinkedIn. 53.1% (n=144/249) indicated that they spend fewer than 10 minutes per week on LinkedIn. Another 29.5% (n=80/249) spend 10 to 30 minutes per week on LinkedIn.

Our data also show a significant correlation between study year and students' use of LinkedIn. There is a positive significant association between year of study and whether or not students have an active LinkedIn account ($X^2(3) = 50.996$; $p<0.001$). All participants in their final year of study have an active account on LinkedIn (n=53). This is in contrast with the first-year student population, in which 44% (n=35/79) do not have an account. Furthermore, there is a significant association between year of study and how often students check their LinkedIn account ($X^2(12) = 48.228$, $p<0.001$) and how much time they spend on LinkedIn per day ($X^2(9) = 22.682$, $p=0.007$).

4.2 RQ2: What motivates international business students to use LinkedIn?

Students were asked why they use LinkedIn and were given a list of purposes to choose from (students could choose multiple purposes). LinkedIn was to expand their network (n=174), followed by looking for internship opportunities (n=162) and seeking job opportunities (n=148). Table 5 presents the complete list of the purposes of use.

Table 3: Purposes of use

Purpose of use	**Frequency**	**Percentage (%)**
Expanding network	174	69.9
Internship possibilities	162	65.1
Job seeking	148	59.4
Information seeking	146	58.6
CV improvement	112	45.0

Purpose of use	Frequency	Percentage (%)
Part of an assignment	60	24.1
Check socially friends	51	20.5
Other	27	10.8

Note. A total of 249 students answered this question; students were allowed to choose multiple purposes.

There is a significant association between year of study and students' purpose for using LinkedIn ($X^2(24) = 108.328$, $p<0.001$). The data show that students' purpose for using LinkedIn is related to their study activities (e.g., using LinkedIn to search for internship opportunities). The higher the study year, the greater percentage of students used LinkedIn to search for internship opportunities.

To further understand students' motivation for using LinkedIn, we asked which criteria students used to make a connection. The highest percentage of students (42.6%; n=106) connect with people that they want to stay in contact with; the second largest group connect with people whose status they perceive to be high (i.e., famous people).

Finally, we asked how students find people to connect with. Most students do so using a search option (52%) or automatic suggestion (40%). Only a small percentage of students make connections based on existing contacts (8%).

4.3 RQ3: What is the role of personality traits in explaining international business students' behaviour on LinkedIn?

Our survey measured personality traits based on the Big Five model (see Table 1). We used the terms high and low to specify whether a user presented elevated levels of a personality trait or not. We used the boxplot function in SPSS to distinguish these thresholds. That function provides information about the spread of data by excluding extreme values and establishing a centre point. A user who scored above the centre point was defined as high and the other users were defined as low.

We found that:

a. Students with high openness values tend to use LinkedIn for information seeking (n=99/220)
b. Students with high openness values do not tend to use LinkedIn for social checking (n=139/220 who answered NO)
c. Students with high conscientiousness values do not tend to use LinkedIn for social checking (n=126/220 who answered NO)
d. Students with high conscientiousness values tend to use LinkedIn as a part of an assignment (n=121/220 who answered YES)
e. Students with high extraversion values do not tend to use LinkedIn for social checking (n=65/220 who answered NO)
f. Students with high neuroticism values tend to use LinkedIn as a part of an assignment (n=80/211 who answered YES)

4.4 RQ4: What is the role of international experiences in explaining students' behaviour on LinkedIn?

Research question 4 scrutinises students' international experiences and backgrounds in relation to their behaviour on LinkedIn. 54% of the respondents were international students (i.e., from outside the Netherlands).

We found a significant association between students' country of origin (Dutch vs international students) and their purpose for using LinkedIn ($X^2(8) = 17.270$, $p=0.027$). International students tend to use LinkedIn more for information seeking and job seeking than Dutch students. Dutch students are more likely than international students to use LinkedIn because it is part of an assignment.

In addition, we found a significant association between students' country of origin (Dutch vs international students) and how they make connections on LinkedIn ($X^2(3) = 14.456$, $p=0.002$). International students are more likely than Dutch students to use their existing contacts to make new connections.

The survey presents enough evidence to suggest that students' international experiences affect their behaviour on LinkedIn. In correlation with international experience, we found significant associations between students who have studied abroad and:

a. the number of connections on LinkedIn ($X^2(6) = 14.169$, $p=0.028$)
b. how often they check their LinkedIn account ($X^2(4) = 12.085$, $p=0.017$)
c. their purpose for using LinkedIn ($X^2(8) = 34.234$, $p<0.001$)
d. the criteria students use to select a connection on LinkedIn ($X^2(3) = 11.753$, $p=0.08$)

In correlation with experience working at an international company, we found positive associations between students with experience in working at an international company and:

a. whether they have an active LinkedIn account ($X^2(1) = 9.925$, $p=0.02$)
b. the number of connections on LinkedIn ($X^2(6) = 31.892$, $p<0.001$)
c. how often they check their LinkedIn account ($X^2(4) = 14.132$, $p=0.007$)

Furthermore, we also found significant associations between students who did an internship abroad and:

a. the number of connections on LinkedIn ($X^2(6) = 14.169$, $p=0.028$)
b. how often they check their LinkedIn account ($X^2(4) = 12.085$, $p=0.017$)
c. how they make connections on LinkedIn ($X^2(3) = 11.128$, $p=0.011$)

4. Conclusions

Based on the aforementioned results, we can draw some conclusions. First, in terms of students' behaviour on LinkedIn (RQ1), it can be concluded that although the majority of students have an active LinkedIn account, most of them do not actively use LinkedIn. They reported low frequencies of checking their account and do not spend much time on LinkedIn. This confirms the findings of previous studies.

In regard to the motivation for using LinkedIn (RQ2), most of the students use the platform for information and job seeking (either a paid job or an internship opportunity). This finding indicates that students recognise the value of LinkedIn for supporting their career development. This finding is also in line with previous studies on the topic.

In addition to confirming previous studies' findings, our study offers new insights about the factors that explain students' behaviour on LinkedIn (RQ3 and RQ4). First, the study year seems to play a role in explaining

students' activity on LinkedIn. Fourth-year students tend to use LinkedIn more actively than students in earlier study years, as indicated by how often they visit the site and how much time they spend on it.

Second, our study also demonstrates the role of personality traits in explaining students' behaviour. We found a positive association between openness or extraversion and social checking and information seeking through LinkedIn. We also found a negative association with conscientiousness. Neurotic students mostly tend to use the platform when it is part of their assignments. We also found associations between time spent on LinkedIn and openness and conscientiousness.

Finally, our study shows the importance of international experience when explaining students' use of LinkedIn. Students who had international experience (e.g., study abroad, internship abroad or work at international companies) used LinkedIn more actively. We found that the more international experience a student has, the more time they spend on the platform and the more critical they are in their use. There is also significant evidence that suggests an association between students' country of origin (Dutch students vs international students) and their use of LinkedIn. This factor seems to play a role in explaining students' purpose for using LinkedIn.

As we discussed in the literature review section, most earlier studies of students' use of LinkedIn were done in the context of universities in the USA. Our study at a business school in the Netherlands shows that these students share similar patterns of LinkedIn use with their counterparts in the USA.

While the importance of LinkedIn for students' professional development has been acknowledged, students are still not very active on LinkedIn. Our data suggest that as students advance in their studies, they become more aware of the advantages of LinkedIn and use the platform more actively. Considering the advantages that students can gain from LinkedIn, it is important for educators to stimulate its use as early as possible. When designing training to teach students to use LinkedIn effectively, educators need to consider the students' personality traits, as our survey show that students with different personality traits tend to exhibit different behaviour on LinkedIn.

Furthermore, for international higher education institutions, the positive correlation between students' international experience and their active use of LinkedIn points to the importance of integrating an online networking platform such as LinkedIn in the curriculum. Such a platform contributes to developing students' professional international experience.

Our study also had some limitations. First, it involved only one institution; studies that include more universities might help solidify our findings. Furthermore, this study is based on students' reflections on their use of LinkedIn, which cannot fully capture their actual use of the platform. We recommended that future studies on LinkedIn use take a different approach that can better capture students' actual behaviour on LinkedIn. Regarding the traits and models used, future studies could incorporate more personality traits and different models (e.g., dark triad, anxiety and stress levels models, burnout scales) to enrich the associations between traits and use habits. Finally, while our study revealed positive correlations between the use of LinkedIn and study year and international experience, it did not capture how this use is changing over time. A longitudinal study on the use of LinkedIn could offer more insights into how use changes over time by following students' progress through their studies, including international experiences they gain during that time.

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Using technologies to re-imagine the assessment of professional placement in initial Teacher Education

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In recent years there has been an unprecedented focus and a vast amount of research, commentary and discourse on the 'quality' of teaching (Cochran-Smith, 2012; Harford, Hudson, and Niemi 2012). Against this background of recent changes to initial teacher education, policies in Ireland have included the re-conceptualisation of both concurrent and consecutive programmes with a greater focus on the broader notion of professional competence. Professional competence goes well beyond the simple acquisition of knowledge and skills. Korthagan (2010) has identified teaching as a 'social activity' and has noted the affective dimension of learning to teach encompassing an intellectual and practical activity with an important emotional and creative dimension.

In programmes of initial teacher education the period of professional placement is seen by many as vital for the growth of professional competence of the student teacher. However, the assessment of competency-based programmes is often seen as problematic and necessitates a robust and multifaceted system.

This presentation examines the assessment of professional competence in the context of teacher education in one higher education institution. The teaching and learning environment at Hibernia College is designed so that students engage with the programme content, with their tutors and with each other across virtual and physical learning spaces. The assessment strategies are designed such that they require students to be innovative in how they demonstrate achievement of the learning outcomes.

This workshop will provide examples of how the assessment of placement was re-imagined during Covid-19 with innovative technologies and will examine the frameworks designed to support faculty and students in the placement setting.

Enhancement and extension of the printed book: An online gamification model to complement educational textbooks

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Abstract

Despite the significant increase in the use of digital devices, and the access to e-books by younger ages, the printed book still remains very important. Nowadays, although many communication processes and information exchanges have a digital support, the importance of using printed paper is acknowledged in many contexts. Both the paper and the digital media have unique advantages: digital media integrate with audiovisual and interactive resources, and the paper book supports interactions such as tactile and kinesthetic feedback given to both hands.

In recent years there have been several commercial products designated as "augmented books", using augmented reality technologies to provide the reader with more layers of information, thereby fostering the use of the book in new ways. So, in this concept paper we describe part of the research and outcomes of project CHIC – C3, aimed at designing and developing a platform for managing the production of digital content connected with printed books. Furthermore, we propose a model for the gamification of digital content based on the printed book, mainly aimed at educational purposes. A proof of concept for the model was built in the form of a companion platform, supported by the Moodle LMS, fully integrated with the main CHIC website. Readers are able to access the platform, engage in several content related games, and interact with other readers.

Keywords: gamification, Moodle, e-learning, textbook.

1. Introduction

Despite the significant increase in the use of digital devices and the access to e-books by younger ages, mainly explained by the diffusion of tablets, the printed book still remains very important. Even for parents who prefer digital books for themselves, printed books remain the objects of choice for their children (Richtel and Bosman, 2011).

Nowadays, although many communication processes and information exchanges have a digital support, it is acknowledged the importance of using printed paper in many contexts. Both the paper and the digital media have unique advantages: digital media integrate with audiovisual and interactive resources and the paper book, as underlined by Jürgen Steimle (2012), supports interactions such as tactile and kinesthetic feedback given to both hands.

The use of augmented reality (AR) technologies in the context of the printed book has also been arousing an enormous interest both from academia and publishers. In recent years there have been several commercial products in the area of "augmented books" (e.g., The Little Mermaid; Storybooks alive; Popar), that is, books that use AR technologies to provide the reader with more layers of information, thereby fostering the use of the book in new ways.

Education in general, like any other human activity, has not been immune to the phenomenon of the “Internet of Things” (Gómez, Huete, Hoyos, Perez, & Grigori, 2013). The ubiquitous learning potential is reflected in increasing access to learning from collaborative learning environments and content supported by computers anytime and anywhere. It also allows for the right combination of physical and virtual spaces.

In this concept paper we describe part of the research and outcomes of project CHIC – C3, a project financed by the Portuguese Programme Compete 2020. The project aimed to design and develop a platform for managing the production of digital content connected with printed books. From this perspective, the book is not anymore considered as being just made of plain paper, but something that can be enhanced and become “alive” in terms of end-user experience. Mainly through the use of AR technology and a gamification platform, the project developed ways to enhance and extend the traditional book. In this paper we will discuss and report on the latter component, namely, the development of gamification and digital content based on the printed book, mainly for educational purposes supported by the Moodle learning management system.

2. Background

2.1. Gamification

Research in educational technology needs to go far beyond learning with multimedia to recognize the role of new learning experiences, for example, one that games and simulations can reveal. The learning model which we call "ludic" - based on games - can be used in formal or informal education by well-defined age groups, and can be introduced in various scientific fields. In the educational context, considering that "ludic” is not usually a priority in most activities, a game may be the motivating factor that is needed in many learning resources.

Gamification is a relatively new concept that has acquired considerable momentum over the last years. It is a concept that integrates the mechanics of gaming in non-game activities to make these more effective and enjoyable (Bidarra, Figueiredo & Natálio, 2015). When used in the educational field, gamification seeks to integrate game dynamics and game mechanics into learning activities, for example, using tests, quizzes, exercises, badges, etc., in order to increase intrinsic motivation and foster student participation.

So far, there have been essentially three approaches to Game-Based Learning (Gené, Núñez & Blanco, 2014):

- Using commercial off-the-shelf videogames, taking advantage of the existence of content in these games that can be used for educational purposes;
- Using Serious Games, a type of video game developed with non-recreational purposes where learning is the primary goal;
- Students building their own game which allows the development of problem-solving abilities, programming skills and game design skills.

Unfortunately, the production and deployment of educational games is not without difficulties, particularly:

- The high development costs and an uncertain market make investment in educational games and innovations too risky for producers;

- Institutions resist adopting innovations and do not want to make unnecessary changes and investments, including the use of new technologies for learning;
- Instructors, institutions and publishers do not (traditionally) want to replace textbooks with educational games;
- The value of specific educational technologies (games, simulations, etc..) have not been proven in many cases;
- Parents and teachers still have very negative attitudes about the use of games in the classroom;
- Games are especially suited to teach higher order skills that are not typically assessed through examinations (multitasking, decision-making, strategic vision, etc.);
- Easy access to computers and the Internet cannot be taken for granted in educational institutions (the case of many developing countries).

2.2. Moodle and gamification plugins

In order to address some of these issues, we built a learning environment based on the Moodle platform[1] Moodle is an open source learning management system with a huge user base around the world, and is widely used for distance learning. Founded on a social constructivist perspective, it is in fact a flexible enough system, to allow for the implementation of various pedagogical models (ex. Pereira et al., 2008). In particular, for the work reported in this paper, we used Moodle to test the book gamified complement model proposed in the following section.

Moodle can be extended with a plugin system in order to fulfil one's needs and application context. For this project in particular, we used the H5P[2] and "Game"[3] gamification plugins.

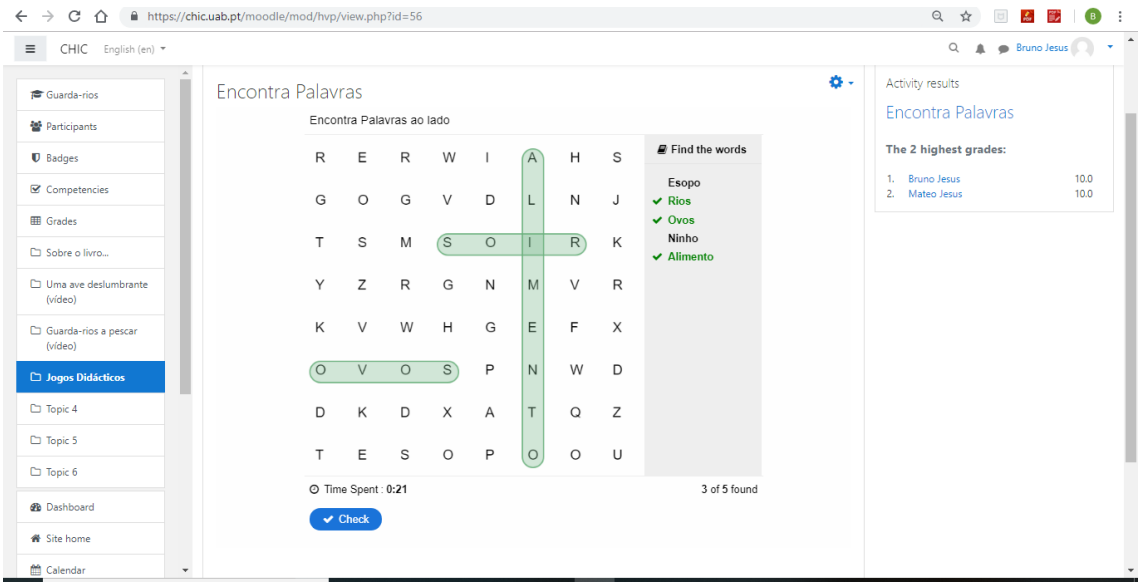

Figure 1: "Find the words" game in H5P

[1] https://moodle.org
[2] https://h5p.org
[3] https://moodle.org/plugins/mod_game

H5P is a framework for including rich media content in online learning environments. It uses recent technologies such as HTML5, Javascript and CSS for creating interactive activities with rich multimedia contents (see figure 1).

The “Game” plugin was also used to provide additional gamified activities, in particular crosswords.

A course in Moodle corresponds, in this project, to a specific book, and complements it with several online activities based on the H5P and Game plugins, as described. Books/courses are organized in categories, according to the book genre (adventure, romance, crime, western, textbooks, etc.).

Each course has a discussion forum, and a set of games from both plugins, complementing the contents of the book and providing additional engagement with it.

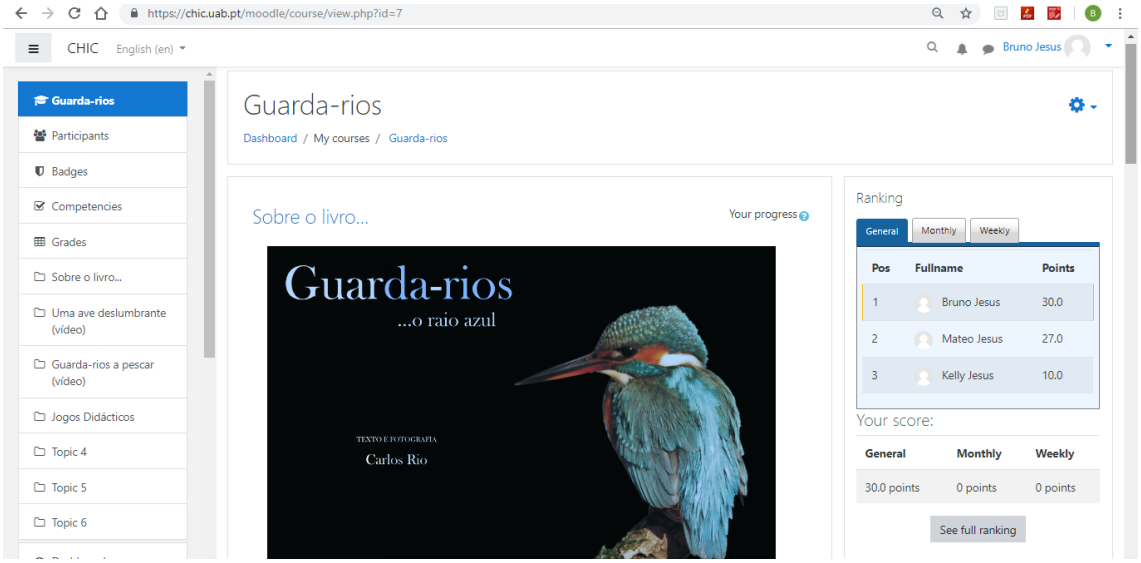

Figure 2: Score ranking block

An additional gamification element was also incorporated in the form of score ranking tables (i.e. “hall-of-fame” tables), as shown in figure 2.

3. Development of a gamification model for augmented books

The main platform of the CHIC C3 project allows the creation of an “augmented” book and its connection via external interfaces to external devices and the Moodle platform. In this sense, the structure for the platform includes the following modules:

- Users - provides user-type management features;
- Permissions Control - responsible for assigning permissions to various user types;
- Notifications and internal communication - provides functions of communication and internal collaboration, fundamental for a collaborative platform;
- Content Management - This module is responsible for the storage, organization and availability of the content;
- Connection with Moodle - responsible for integrating and exchanging data with Moodle platform;

- Collaborative book project - this module will provide all the collaborative and interactive authoring features for the “augmented” book;
- Web2Print - This is module will be integrated into the platform to allow digital printing of the book via Web;
- External API - the external API will expose a set of endpoints to enable the contact and transfer of relevant data, content, and information between the platform and external devices to be used to extend the use of the traditional book (e.g.: Mobile devices and others that may arise in the future);
- Purchase - The Purchasing module will allow to manage the functionalities of purchase orders, payments and content subscriptions;
- Hybrid experiments - This module will allow to manage the events of external devices.

The platform will be integrated with external systems such as Moodle in order to provide specialized functionalities such as transmedia content, gamification strategies, interaction through augmented reality and context dependent, etc. The creation of communities around the book and the development of gamification and transmedia strategies is being done through Moodle, an educational platform that allows the creation of personalized learning environments. Figure 3 shows the overall proposed architecture.

The main goal to attain, with the gamification tools in Moodle, is the application of elements present in video games to other activities outside the usual contexts and with educational purpose, namely:

- Comply with rules;
- Establish clear objectives and reward achievements through scoring systems or trophies (reward and return system);
- Launch challenges;
- Develop the action according to difficulty levels in order to stimulate performances and promote the creation of plots/narratives and avatars.

By this means, we are proposing a new way to develop a narrative on multiple platforms, increasing the learning and involvement of the potential user. This will help to achieve the conversion of the traditional paper into a universe of the transmedia narrative. It is a real possibility of increasing its diffusion and consumption.

4. Moodle integration and API

In order to develop this multi-platform environment, we put in place two mechanisms to promote seamless navigation: user integration and an API to exchange information with the main portal.

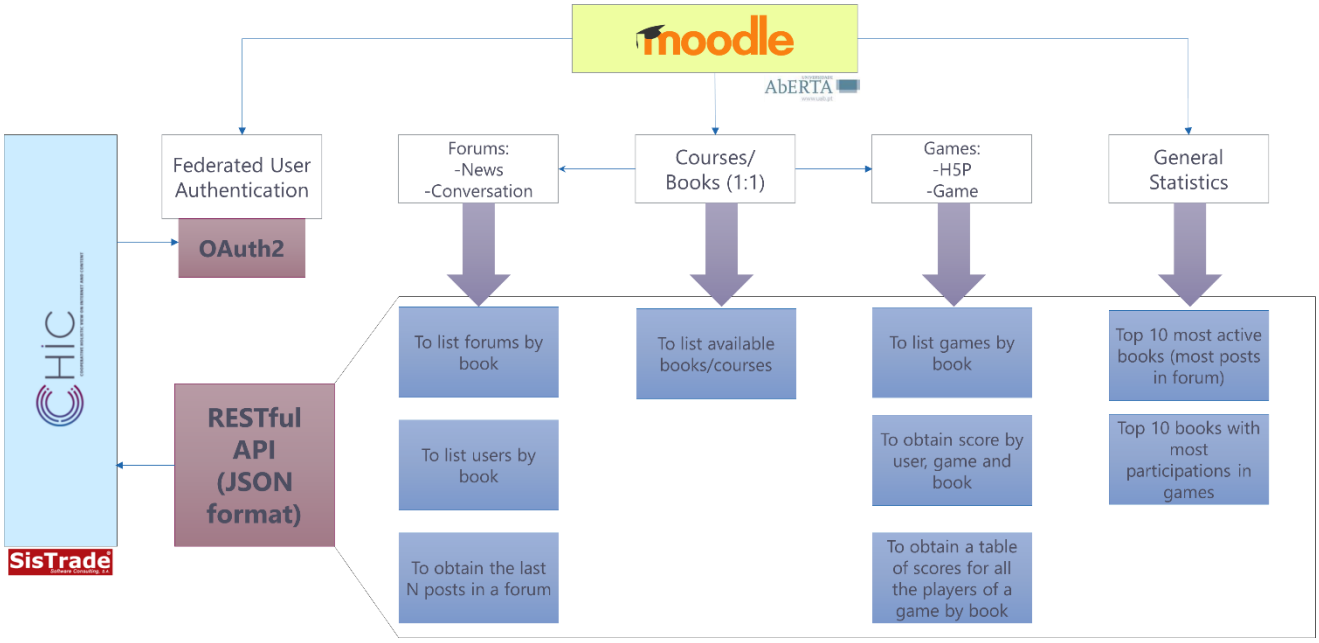

Figure 3: Platform and API architecture

4.1. User integration

As users register in the main portal, they can navigate to the Moodle platform without having to register or login again. Single sign-on is achieved through a mechanism based on the OAuth2 protocol, that Moodle fully supports, and an external federated authentication server, using the open source Keycloak technology[4]. The Keycloak server provides identity and access management services, as well as user federation, effectively allowing users to authenticate once and navigate among the various platforms of the project.

4.2. API functionality.

To further integrate information on the several platforms, we made use of the Moodle web service facilities to publish an API that provides data to be displayed elsewhere, especially in the CHIC main portal. Figure 3 graphically shows the functionality that needs to be displayed in the portal.

For this purpose, web services in Moodle were activated via REST protocol. For some of the functionalities (e.g. displaying available courses), Moodle already provides core functions to accommodate those needs. Other functions needed to be implemented as plugin web services, using templates and standard Moodle programming directives. The languages used were PHP and SQL for database queries. In what follows, we describe the API functions in some detail. A Moodle user account with adequate permissions is required, for whom an API access token is generated, and must be included in all queries, through parameter *wstoken*. The results may be given in XML or JSON formats, depending on the parameter *moodlewsrestformat*.

4.2.1. Functions related to Books/courses

- To list available books/courses

  Function: core_course_get_courses

  Parameters: <none>

[4] https://www.keycloak.org

Call URL example:

<Moodle_address>/webservice/rest/server.php?wstoken=<token>&moodlewsrestformat=json&wsfunction=core_course_get_courses

Result: array of objects with all the information on the available books/courses

- To list forums by book

  Function: mod_forum_get_forums_by_courses

  Parameters: courseids (array)

  Call URL example:

  <Moodle_address>/webservice/rest/server.php?wstoken=<token>&moodlewsrestformat=json&wsfunction=mod_forum_get_forums_by_courses&courseids[0]=2

  Result: array of objects with all information on existing forums for the course. The main fields for each one are: id and name. Forums that allow discussion are of type "general", while the others can be ignored.

  Possible errors: if coursed does not exist, the function returns an empty array, []

- To list users by book

  Function: core_enrol_get_enrolled_users

  Parameters: courseid

  Call URL example:

  <Moodle_address>/webservice/rest/server.php?wstoken=<token>&moodlewsrestformat=json&wsfunction=core_enrol_get_enrolled_users&courseid=2

  Result: array of objects with all information on users. The main fields of each one are: id, fullname, email. The result must be filtered by the field "roles", since we are only interested in users with roleid 5 (student).

  Possible errors: if coursed doesn't exist, the function returns a structure {"exception":"dml_missing_record_exception","errorcode":"invalidrecord","message":"Can't find data record in database table course."}

- To obtain the last N posts of a forum for a book, including the users that posted them.

Function: local_get_latest_posts_from_forum

Parameters: forumid, maxposts (default: 5)

Call URL Example:

<Moodle_address>/webservice/rest/server.php?wstoken=<token>&moodlewsrestformat=json&wsfunction=local_wschic_get_latest_posts_from_forum&forumid=2&maxposts=5

Result: array of objects with the information on each post, with the fields userid, subject, message and timestamp.

Possible errors: if forumid does not exist, the function returns an empty array, []

4.2.2. Functions related to Games

- To list games by book

Function: local_wschic_get_games_by_course

Parameters: courseid

Call URL example:

<Moodle_address>/webservice/rest/server.php?wstoken=<token>&moodlewsrestformat=json&wsfunction=local_wschic_get_games_by_course&courseid=2

Result: array of objects with game identification, each with fields id and name.

Erros: if courseid does not exist, the function returns an empty array, []

- To obtain score by user, game and book

Function: local_wschic_get_score_by_user_game

Parameters: userid, gameid

Call URL example:

<Moodle_address>/webservice/rest/server.php?wstoken=<token>&moodlewsrestformat=json&wsfunction=local_wschic_get_score_by_user_game&userid=6&gameid=2

Result: object with a single field score. If the game has never been played, the value is *null*.

Possible errors: if userid or gameid don't exist, or if the user has not access to the game, the function returns the structure: {"score":-1}

- To obtain a table of scores for all the players of a game by book

Function: local_wschic_get_score_table_by_game

Parameters: gameid

Call URL example:

<Moodle_address>/webservice/rest/server.php?wstoken=<token>&moodlewsrestformat=json&wsfunction=local_wschic_get_score_table_by_game&gameid=2

Result: array of objects with the scores of the various players, each with the fields userid and score, sorted by decreasing score.

Possible errors: if gameid does not exist, the function returns an empty array, []

4.2.3. Functions for General statistics

- Top 10 most active books (more posts in the associated discussion forum)

Function: local_wschic_get_top_active_courses

Parameters: top (default: 10)

Call URL example:

<Moodle_address>/webservice/rest/server.php?wstoken=<token>&moodlewsrestformat=json&wsfunction=local_wschic_get_top_active_courses&top=10

Result: array of <top> objects with the courses (books) and number of posts in forums, sorted in decreasing order.

- Top 10 books with most participations in games (most participated books)

Function: local_wschic_get_top_played_courses

Parameters: top (default: 10)

Call URL example:

<Moodle_address>/webservice/rest/server.php?wstoken=<token>&moodlewsrestformat=json&wsfunction=local_wschic_get_top_played_courses&top=10

Result: array of <top> objects with courses (books) and number of game participations, sorted in decreasing order.

All these API functions were developed and successfully tested in the multi-platform environment, using an example book/course about the kingfisher, a bird species occurring in Portugal. As a result, readers now have the gamification functionalities and scores on the Moodle platform, while also being able to check the same information in the main CHIC platform.

5. Conclusion

The increasing availability and use of books in the digital form has not replaced the printed form, especially in the case of children's literature. Instead of viewing digital technologies as an alternative to physical books, in this concept paper we proposed a model for enhancing the experience of reading printed books with digital contents and activities that complement the actual reading.

The proposed model is based on basic principles of gamification, and extends the content of the book by providing online activities that launch challenges, complying with rules and establishing clear objectives and achievement rewards through scoring systems or trophies (reward and return system). The action is developed according to levels of difficulty in order to stimulate performances and promote the creation of narratives and avatars.

We exemplified the application of the model in the context of project CHIC – C3, where a specific platform architecture was built to provide an enriched experience of printed books in all their phases, from production to user interaction. Through the use of Moodle and some of its gamification extensions (plugins), we were able to successfully integrate a digital dimension complementing physical books into the overall platform for the benefit of the end user. The integration was achieved through two main aspects: federated authentication of users, allowing them to login and navigate seamlessly among the various platforms, and a web service API for exchanging information on games and interaction in the Moodle platform, further adding to the sense of seamless interaction with a single system.

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Exploring perceptions of social presence among researching professionals

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Abstract

The Open University (OU) offers Professional Doctorates (PD) in Education and Health and Social Care. Since our students study remotely, except for annual residential weekends when they meet face-to-face, the programme team expected little disruptions from the implementation of social distancing measures enforced in educational settings due to COVID-19. In this case study of the PD programme at the OU managing the pandemic we focus on the impact of social distancing restrictions preventing PD researchers from meeting face-to-face. We examine the ways the Programme Leaders reconfigured the PD programme to develop opportunities for *social presence*. We focussed on the cohort who started their doctorate in October 2020, amidst the pandemic. Using an online questionnaire and focus group discussion we explored their perceptions of social presence.

Key words: professional doctorates, doctoral students, covid-19, social presence, distance education

Acknowledgements

We would like to thank Dr Hilary Lindsay for conducting the focus group discussion and the professional doctorate students who participated in this piece of research.

1. Introduction

In March 2020 the UK Government responded to the COVID-19 pandemic by instituting a national lockdown. A year later, the impact on our personal and professional lives has been profound.

For those studying a professional doctorate (PD), the pandemic's impact has been three-fold. Firstly, PD researchers have been unable to attend lectures, seminars, and residential schools on campus.

Secondly, the overnight pivot to working from home or increased pressures on health services while home-schooling and/or looking after relatives has meant their professional workloads intensified at a time when their personal life was in upheaval. Thirdly, the context of their research altered. Data collection had to be abandoned or recalibrated to suit online methods, while the organisational context of their research — e.g. health organisations, social care settings or educational institutions — were either closed or caught up in managing the pandemic.

In this case study of the PD programme at the Open University (OU) managing the pandemic, we focus on the first type of impact: social distancing restrictions preventing PD researchers from meeting face-to-face. We examine the ways the Programme Leaders reconfigured the PD programme to develop opportunities for *social presence*, that is opportunities for individuals to demonstrate their state of being in a virtual environment, signalling their availability for interpersonal transactions (Kehrwald, 2008). For this reason, we focussed on the cohort who started their doctorate in October 2020, amidst the pandemic. Using an online questionnaire and focus group discussion we explored their perceptions of social presence.

2. Contextual background

2.1 The PD programmes at The Open University

The OU offers two PDs, one in Education (EdD) and one in Health and Social Care (DHSC). These part-time sister programmes are typically undertaken by established professionals who, often working full-time, research their own practice. The blended programmes are structured into two stages and integrate online learning, supervision and an annual face-to-face residential weekend. Stage 1 (years 1 and 2) consists of nine self-study modules, and Stage 2 (years 3+) comprises of a supervised research project, the submission of a thesis and viva voce examination.

2.2 Defining social presence

Social presence theory explores and explains the social aspects of online learning. While there is contestation around precisely how it is best defined, it is beyond the scope of this chapter to explore its multiple meanings. We view social presence in close relation to interpersonal interaction, emphasised by individuals having the *ability* to send and interpret social presence signals, the *opportunity* to interact socially and the *motivation* — need for and interest in — for relational exchanges (Kehrwald, 2008).

2.3 Enhancing social presence during the pandemic

The PD programme's online pivot was supported by an institution with more than 50 years' experience of digital learning. Predicated on personalised study patterns, flexibility is one of our core pedagogic values. Students have the option of up to two years of study breaks to manage the unexpected. We did not anticipate the pandemic causing major disruption to the programme. Nonetheless, with the confinement brought by the pandemic, as a short-term intervention, Programme Leaders introduced a series of fortnightly Saturday morning drop-in support sessions for these researching professionals. We explored managing study during the lockdown, wellbeing, online data collection and writing COVID-19 into your thesis (Dennis & Waterhouse, 2020). At the end of our four-planned sessions we were surprised to find that students expressed a desire for the meetings to continue. Aware that the uncertainty of upheaval had the potential to engender feelings of isolation and loneliness, poor

performance and drop out (Liu, Gomez & Cherng-Jhy, 2009), we established monthly student-led seminars which allowed for cross-cohort interactions.

While social presence is rightly understood as working dynamically with teaching (what teachers do to structure the learning) and cognitive presence (selection of learning content) (Nolan-Grant, 2019), we note with interest that student-led seminars have leant away from cognitive material towards biographical accounts of doctoral study. Rather than presenting their research, students have foregrounded personal experiences. These biographies are a mutual signal of students' state of being and their availability for interpersonal transactions. They underlined the importance of ensuring that, in transitioning our October induction to an online format, we provided ample opportunities for the new cohort of PDs to establish social presence: being real, available and there.

There were several pedagogical challenges associated with this adaptation. The online environment offered fewer opportunities for corridor conversation. Nor are systems, tools and platforms universally familiar or accessible. We adopted a synchronous flipped approach to sessions (Zheng, Bhagat, Zhen & Zhange, 2020) maximising time available for discussion and collaboration. Before the event, we sent students an induction pack which included MP4 recorded orientations to their year of study and website tours. Students made themselves known to each other — an important part of establishing social presence (Kehrwald, 2008) — through their profiles on a digital wall (Padlet). Students, supervisors and the programme team posted an image, an account of their research and a brief biography. In addition, we used Twitter to engender the social presence of the programme team (Weidlick & Bastianens, 2019), this was especially helpful for new students who did not yet have access to the university's communication systems. During the online induction various strategies were used to create a collaborative space and stimulate discussion (Yaun & Kim, 2014). These included a 'Sharing your research' session where students, along with members of the programme team, in small groups clustered by research topics, discussed their professional backgrounds and proposed research topics, a session where students brought in objects which were critically analysed in breakout rooms using a 'study diamond' (Clifton, 2012), while invited guests gave presentations (around academic writing or life after the Professional Doctorate). The weekend culminated with an online a pub quiz.

Each year we host four synchronous seminar discussions. Two weeks after the induction residential, during our first seminar we asked students to reflect on 'developing as a researching professional' prompted by a series of questions and activities. This seminar was notably dominated by affective responses (Rouke, 2001). Students shared goals and concerns about starting their doctorate. The October 2020 cohort joined the programme at a point when student-led seminars were firmly established, and the new cohort of students had a platform upon which to interact with students further along in the doctoral journey. The PD team also fostered greater online engagement with the Faculty's PhD programme, creating opportunities for social interaction between two usually disparate groups of doctoral researchers. We have hosted a new year lunch online where participants brought in and shared household objects that represented their research, a Faculty online doctoral research conference which included traditional presentations, a wellbeing drop-in strand and a gallery of creative representations of research and an intensive online writing camp week.

3. Research approach

The purpose of the research was to explore perceptions of social presence amongst the 2020 PD cohort at the OU using a mixed-methods approach. Given the on-going nature of the pandemic and the uncertainty of future face-to-face encounters, the research aimed to develop activities to improve the programme for new and existing cohorts. After receiving ethical approval from the OU's Human Research Ethics Committee (HREC/3885/Waterhouse), we used a survey to measure students' perceptions of social presence, and a focus group discussion to enable them to exemplify and explain survey responses.

3.1 Online survey

There were 37 PD students in the 2020 cohort (28 on the EdD; 9 on the DHSC). Over a two-week period in March 2021, they were invited to complete an anonymous 15-minute survey (with both closed and open-ended questions) embedded on the programme's website. 11 students responded.

The closed questions consisted of adapted items from the validated scale of social presence developed by Arbaugh et al., (nd) as part of the Community of Inquiry questionnaire. This scale covers three components of social presence: affective expression, open communication and group cohesion. Respondents answered on a Likert type scale ranging from 1= 'strongly agree' to 5= 'strongly disagree'. The inclusion of open questions additionally enabled the collection of students' views in free-text responses. These questions explored what specific programme activities, or formal and informal communication spaces enabled students to or prohibited them from establishing and maintaining social presence.

3.2 Focus group discussion

Given that richness of data derived from text responses to open-ended survey questions is frequently less than information derived from interview or focus group discussion (FGD) (LaDonna, Taylor & Lingard, 2018), a focus group discussion was held subsequently to investigate the main findings from the survey's questions in greater depth. The FGD was conducted, transcribed and anonymised by a researcher outside the Programme team. The discussion covered students' needs and feelings while studying the PD, preferences and difficulties communicating with peers and supervisors online and the delivery of the doctoral programme under the circumstances of the COVID-19 pandemic. Five students took part in the FGD.

4. Structured responses: The survey

Table 1 displays the responses on the social presence scale. Considering open communication first, the majority of respondents reported comfort with interaction in the online environment. Over 90% reported that they strongly agreed or agreed with the statements relating to feeling comfortable communicating in the online environment, participating in programme discussions, interacting with the programme team and with other doctoral students. Despite this comfort with interacting in the online environment, only 45% saw online communication as an excellent medium for social interaction and only 18% strongly agreed or agreed with the statement 'I have been able to get to know some of my peers', with 36% reporting experience of isolation, disconnectedness or loneliness whilst studying for their doctorate.

Table 1: Perceptions of social presence of Year 1 OU professional doctorate students (n=11)

	Percentage			
Affective expression	**Strongly agree or Agree**	**Neither agree nor disagree**	**Strongly Disagree Strongly agree**	**Mean Score**
Getting to know other doctoral students and academics gives me a sense of connection to the programme	45.5	36.3	18.2	2.8
I have been able to get to know some of my peers	18.2	36.3	45.5	3.4
Online communication is an excellent medium for social interaction	45.5	27.3	27.3	2.7
I experienced a sense of isolation, disconnectiness or loneliness whilst studying for my doctorate	36.3	9.1	54.6	3.3
Open Communication				
I feel comfortable communicating in the online environment	91.0	0.0	9.1	1.5
I feel comfortable participating in the programme discussions	91.0	9.1	0.0	1.5
I feel comfortable with other doctoral students	91.0	9.1	0.0	1.6
I feel comfortable interacting with the programme team	100.0	0.0	0.0	1.4
Group cohesion				
I feel comfortable disagreeing with other doctoral students whilst still maintaining a sense of trust	18.2	73.7	9.1	2.9
I feel like my point of view is acknowledged by other doctoral students or academics	45.5	54.5	0.0	2.3
Online discussions help me to develop a sense of collaboration	36.3	45.5	18.2	2.7

5. Unstructured responses: Focus group discussion and open survey questions

The findings from the qualitative data were analysed using thematic analysis. Initial codes were generated representing similar phenomena by the lead authors. Codes were then collated into three main themes using a theory-driven approach and discussed and agreed upon by the whole project team. The three themes – ability, opportunity and motivation - reflect the definition taken of social presence we work with (Kehrwald, 2008). All the quotes in the following sections are from focus group participants.

The first theme examines students' ability for engaging in online activities and reveals the importance they attributed to their previous online learning experiences and capacity to navigate virtual environments. The theme of opportunity was the most prominent and exposes four perceived factors affecting personal connections: need for face-to-face encounters, opportunities for more informal

small group interaction, personalisation of presence, and lack of time. The third theme captures students' motives for interaction where we found clear evidence of the impact of the pandemic on their willingness to connect online as well as a selective participation on what was felt most relevant. The issues emerging from each theme could be seen as interrelated. Students' digital ability could be affecting their perceptions on what may be possible online as well as their motivation for engaging in virtual spaces. At the same time, lack of time could be impacting on the range and length of online activities they wish to engage with. Furthermore, when the professional, the personal and the learning take place remotely, a reduced motivation to engage online could block opportunities for fruitful exchanges. Overall, for the majority of students, there seems to be a sense of disconnection online and a desire for the replication of the real in the virtual with respect to social presence.

5.1 Theme 1: Ability

This theme is related to students' ability to engage within the online environment during the first year of the PD programme. Two main aspects were highlighted.

Respondents suggested that their capacity to interact with others was attributable to their previous experiences. Some students reported that they were familiar with communicating via Teams or Zoom in their professional roles, whilst others also highlighted that they had studied previously with the OU so had experience of using online forums. Forums were appreciated because they enabled students working in different time zones to contribute. They also encouraged careful, thoughtful contributions:

> I think it allows you in writing to put your views forward in perhaps a more considered way, but you have to think about what you're going to write, so that might be an advantage.
>
> Focus Group Discussion participant

On the other hand, a small number of students felt they did not have the knowledge needed to meaningfully interact with others on the programme. For some this related to a lack of awareness of the different activities taking place, whilst for others they felt they did not have sufficient information to make decisions about which events to attend:

> Also, I'm not really sure what to get involved in, so there's various things that have been suggested through the Prof Doc. There's a Tuesday evening and a Thursday 11.00 o'clock but [I don't really know] what to prioritise. Or what would be the best and how to best use one's time. Because there is a time limit. And I think that we were introduced to all these things, but not really helped along the way or given the next step in the journey somehow. And so, as a result I haven't really done a great deal.
>
> Focus group discussion participant

Navigating online learning environments could be stressful, especially as a range of online spaces were used to organise events by the PD programme team, the faculty and the Graduate School. Not all students had the ability to navigate the virtual environments needed to access events and resources:

> I did actually try and join (GS [Graduate School] coffee morning) a couple of weeks ago, but I couldn't get into it. So, I then emailed and the reply was that I needed to be let in. There was

> another way and there was something else had to be done before I could get in so it's more complicated than just…so that was it then, I didn't join that week and I haven't had chance.
>
> Focus group discussion participant

5.2 Theme 2: Opportunities

Opportunities are related to contextual factors that enhance or inhibit students getting to know each other on the programme. Four aspects emerged.

Firstly, lack of face-to-face interaction. Most students felt the cancellation of the face-to-face induction due to COVID-19 prevented them from developing supportive peer groups:

> I think that that weekend that we did online, if we'd been able to do face to face we [would] have made friends, in inverted commas, or you'd buddied up with people in a natural way because organically you do that when you're face to face. And you get a choice of somehow it works out and then you would have had a little group; maybe you could have followed through, or at least one person.
>
> Focus group discussion participant

In contrast, one research participant emphasised her preference for a wholly remote learning experience. This brings into sharp relief the extent to which online events remove the stress of travelling to campus and thus enhances the opportunity for social interaction:

> The activities [for the induction] were moved online and actually this suited me. When interacting with colleagues and fellow students online I was relaxed and happy rather than exhausted and uncomfortable [after] a physical journey […]. Everything was much better during the pandemic regarding interactions.
>
> Questionnaire respondent

Secondly, a major topic in the FGD data was the nature of interaction. There was a sense that the opportunities for interaction offered by the PD programme were structured and formal. Whilst students felt these sessions were useful in terms of cognitive development, they did not see them as offering opportunities to develop a sense of belonging:

> The forum discussions are useful but fairly cold and objective. There is no sense of reaching out to people and feeling supported here. When putting something for the whole cohort to read, especially when you don't know them, I don't feel comfortable letting my guard down in any way.
>
> Focus group discussion participant

Most students highlighted positively programme activities that had allowed them to interact in small groups enabling them to get to know their peers. There was frequent reference to the 'Sharing your research' session offered during induction. In fact, our induction evaluation identified this session as one students gained from the most. Having a fellow traveller on the doctoral journey seems important. One student described the impact of a newly created study buddy system:

> They said 'we're thinking of doing some study buddies' and I thought anything, just to talk to someone and just to have someone to talk to. And then [named student] and I just got paired up. […] that's been really nice. We are doing different topics, but it was just nice to […] share top tips between us and going 'Ah'. […] Also, we've had some wins as well, you know.
>
> Focus group discussion participant

Research participants repeatedly expressed a desire for more small group activities, while highlighting the tension between formality and structure:

> Would I have liked to have more contact with people? Yes, that would have been good … but I wouldn't want it to be a formal space so you could take out that worry about sounding academic enough. […] So, it's a space where you could just go and say I haven't a clue what I'm doing here. Has anyone got any ideas about, you know that sort of space, but with a structure so it doesn't turn into a moan fest for half an hour or whatever.
>
> Focus group discussion participant

Thirdly, an absence of the visual was felt. Postgraduate researchers are social beings, whatever your mode of learning, being seen and being able to see matters. The acquisition of knowledge is a necessary but insufficient aspect of achieving goals which are only accomplished through emotional engagement (Busteed, 2019). It is therefore unsurprising that participants highlighted the lack of 'faces' in the online environment as inhibiting their capacity for getting to know others. The absence of a face makes connection difficult – as this participant explains:

> [I like to] have pictures as I often see folks on Teams except if they come in as a guest with no picture …. even so not everyone has their camera on. The padlet at the beginning of year one was a really good idea as I felt I could see and read about tutors, peers, etc.
>
> Focus group discussion participant

Similarly, in written forum discussions, when people did not set up their profiles, or added their picture to their profiles, there was a sense of an absence of others, of them being not fully there, a feeling of disconnection:

> I like the [asynchronous forum] seminars and feel a link when I read and type in them, but without faces to names the people feel very distanced.
>
> Focus group discussion participant

A fourth aspect mentioned was time. Researching professionals working full-time and studying for 18.5 hours per week lead complex lives with multiple and competing calls on their time. COVID-19 exacerbated what many already felt was time and effort intense, stressful, pressed and lacking in breathing space. Most participants reported that family and work demands prevented them from attending seminars and social events. This, for some, meant they had to be strategic in what activities they engaged with:

> […] it's time. […] I am short of time. Doing the job that we're all doing in the middle of a pandemic has been difficult […] I don't even think it's time, it's brain space. […] I've got

> teenagers at home as well. […] So I've cut down strategically to the absolute bare minimum of what I need to do.
>
> Focus group discussion participant

5.3 Theme 3: Motivation

This theme related to the extent to which the PD programme provided the need for or an interest in students expending limited time and effort on relational exchanges. The issue is whether there are specific tasks requiring relational exchanges which deepen relationships. Two points were raised in relation to this.

One was screen time. The pandemic affected students' willingness to interact socially online. For some, their professional roles required hours in front of a computer. Even if events were accepted as valuable for their studies more 'screen time' made them unappealing:

> I'm on […] Zoom all day. It's just, it's just too much. I saw on Twitter over the weekend that some people were talking about the writing weekend and my supervisor was involved in running it and I would have liked to have done it and I've heard great things about it, but I was just like 'no!?'
>
> Focus group discussion participant

The other point was about the perceived relevance of events. For some the time demands of spending too much time on the computer, combined with a perceived lack of relevance or usefulness of organised sessions resulted in nonattendance. It was reported that sessions with a large group of students did not appear to have the potential for comfortable communication with others:

> I haven't really attended some of the things that are available, but I think if it was something that I was going to [offer] emotional support […] it would get it into my diary, but the groups would have to be a size to feel comfortable for people to be open. You don't want 30 people in it.
>
> Focus group discussion participant

For others, the research topics of peers in their cohort were not relevant to their own interests and therefore affected their attendance to sessions. Instead, some students placed greater value on cross-cohort interaction, rather than within-cohort interactions, due to the sense of belonging they felt in groups with similar research interests.

6 Scholarship on long-term impacts

The impact of the move of our residential weekend online will last considerably longer than the COVID-19 pandemic. Context is key in evaluating learning points from this case. Pedagogies are situationally contingent, embedded and enacted within specific environments (Bayne et al., 2020). The OU has more than 50 years' experience of distance learning. Our online pivot brought us into line with the University's default mode. Technical support and practical advice were close to hand and with some decisions we had only to follow agreed institutional protocols.

Taking social presence as our conceptual guide, our final reflections are organised within its three ongoing conditions.

6.1 Ability

- Digital pedagogies require more than simply transferring face-to-face delivery into their online equivalence. The significance of this may well have been lost in the speed with which transformations were made. In selecting modes of learning students need for social presence is as important as a cognitive challenge.
- It is possible to both build and bridge meaningful encounters online which embeds personalised flexibility and enables more careful considered interactions. Online learning need not be equated with a less personable learning approach.
- The ubiquity of online platforms ensures that PD researchers come to the online pedagogic encounter with experience of digitally mediated communication which can be drawn upon to shape platform choice and use.

6.2 Opportunities

- Interpersonal interaction is a necessary component of social presence. Given constraints on time and energy opportunities, successful interpersonal interaction is greatly a matter of programme design.
- Opportunities for online interaction will not resonate with all students. PD researchers will need guidance in what to prioritise.
- Bandwidth limitations mean it is not always possible to have cameras on during seminars. But a face attached to a name, research profile and biography can be made possible through platforms that run parallel to the programme. The PD learning journey is enjoyable and successful when fellow travellers are experienced as 'real' and 'there'.

6.3 Motivation

- Not all students identify interpersonal contact as important to their learning journey, but if learning is understood as a combination of the social, the emotional and the cognitive (Illeris, 2003) a successful online programme needs to incorporate interpersonal interaction as a core necessity.
- Social presence need not add to screen fatigue; it can be encouraged through online profiles, study buddies and writing groups.
- Relationship building is a core rather than optional activity, programme design could include varied tasks and opportunities from whole group to paired or small group interaction.

7 Conclusion

This study provides a cautionary reminder for colleagues who – driven by the immediacy of COVID-19 - found pedagogic solutions that were exclusively technological. The urgency of simply keeping programmes running understandably obscured all other considerations. More than 12 months into the pandemic, defined by successive waves of infection and the continued presence of a virus we may yet learn to live with rather than overcome, the importance of creating critical friendships, achieving open communications and engendering peer-to-peer support has been brought into sharp relief. This paper evidences the importance of pedagogic relationships that extend beyond supervisor /

supervised, mentor / mentee suggesting social presence as a necessary corrective to an exclusively technological approach to managing learning in lockdown. But our horizons are inevitably short term. The extent to which programmes, having made a successful pivot to online learning make the more graceful pirouette to developing online learning communities (Adams & Jeter, 2021) remains open to empirical exploration.

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On-line Learning and Higher Education Programmes: How Adult Students cope with emerging Issues and Challenges in the Covid-19 and post Covid-19 Era. A Case Study

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Abstract

Nowadays ongoing demand for higher education is growing on a global basis despite critiques concerning high costs, accessibility barriers and the quality of courses (OECD 2014). Meeting this educational demand under the COVID-19 pandemic has posed a challenge for all higher education course providers which had to enhance first emergency pedagogies during the crisis. However, there is little doubt that students had to face multiple issues with digital teaching and learning, educational technologies and ecosystems and student readiness for digital education along with the abrupt shift from conventional, face to face learning to blended learning, digital teaching and learning, educational technologies and ecosystems and student readiness for digital education. Our case study research aims at identifying factors that facilitated or hampered students' transition to digital education concerning an one-year higher education training programme which provides various professionals with necessary pedagogical credentials in order to teach to secondary technical education. The programme took place in the island of Rhodes (Greece) during 2020-21. Our research, via a qualitative approach, will also attempt to (a) identify coping strategies that adult students employed in order to respond to the course' s demands and confront the emerging challenges and (b) suggest that institutions require innovative structural transformations to deal with these challenges.

Keywords: on-line learning/teaching, higher education, qualitative methodologies, self-regulated learning (SRL) strategies

1. Introduction

The spread of COVID-19 created huge waves in the world economy and caused a serious impact on the higher education system. This included, among others, sudden closure of campuses as a social distancing measure to harness community transmission and the abandonment of face-to-face classes for online learning systems. Generally, the burst of coronavirus disease 2019 (COVID-19) put society into an inconceivable situation (Shereen et al., 2020).

This has put emphasis on utilizing eLearning tools and platforms for effective student engagement which may have certain limitations of accessibility and affordability for many students. Also the pandemic has brought into surface the gaps and the shortcomings of the current higher education system and the need for more training of educators in digital technology to adapt to the rapidly changing education climate of the world. In the post-pandemic situation, the use of eLearning and virtual education may develop into an integral part of the higher education system. The higher education institutions should organize the post-pandemic education and research strategies to ensure student learning outcomes and

standards of educational quality (Rashid & Yadav, 2020). Undoubtedly, the most significant pandemic measure called “social distancing” or “physical distancing” has made an attempt to reduce interpersonal contact and thereby minimize the kind of community transmission that could develop quickly in dense social networks like the university campus (Weeden & Benjamin, 2020). As it has been argued also by others COVID-19 pandemic had a devastating impact on human life and shattered economies around the world (Xiang et al., 2020) with a massive jolt to the education systems both in developed and developing countries.
Home education has brought a lot of shocks not only to students but also to their parents ’ productivity (Burges and Sievertsen, 2020). It has become obvious that teaching has moved from physical to virtual classrooms at “untested and unprecedented” level (Burges and Sievertsen, 2020).
However I has been argued that “in some ways Covid-19 was a mere accelerator of the processes that were put into motion some time ago, rather than a radical changemaker” (Tesar, 2020:556), thus underlining the fact that the shift towards online learning/teaching was inevitably going to occur and the covid pandemic functioned as a mere catalyst that sped up the inevitable transition to online teaching and learning.

Considering the fact that very few studies have explored the consequences of Covid-19 on student success during the transition to online learning (Chan et al.,2021), the present case study attempted to explore (a) elements that promoted or made difficult students’ shift to digital education in an yearly program of Pedagogical Training delivered by the Faculty of Pedagogical and Technological Education (Athens/Greece) for technical education teachers in the island of Rhodes/Greece and (b) identify coping strategies that adult students employed in order to respond to the course’ s demands and confront the emerging challenges. We will try to argue that institutions should try to transform in an innovative way the provision of online teaching /learning in order to deal with these emerging challenges.

2.Materials and Methods

2.1 Approach to Data Collection

This study, consistent with Braun and Clarke (2006), used thematic analysis in an open-ended way, to investigate how participants experienced the sudden transition from face to face interaction to online learning. The researcher employed a purposive sampling.

2.2 Interview Process

Participant interviews occurred in their place of work on a prearranged and mutually agreed day. Some of them were taken via phone. Interviews were semi-structured; a guide provided a loose structure within which to explore the topics of interest. The central question were: «How did you deal with online education in general, concerning the obstacles and the learning strategies you had to employ in order to get through it” Where appropriate, the interviewer prompted participants to expand on relevant and interesting responses.

2.3 Participants

Purposeful sampling is a widely used technique in qualitative research whereby those cases most likely to be information-rich on the point of interest are selected in order to effectively

use limited resources (Patton, 2002). We selected twelve people (seven women and five men) out of an online class of 50 online program participants. They were all on permanent contracts and they had experiences from other short or long term training seminars. During the Pedagogical Training Program they had to attend to online classes for approximately four hours five days a week(16:00-20:30) from October 2020 till June 2021. Respondents participated without incentives. As the goal of the study was to gain a depth of understanding on the points of the participants' (P) experience of the online training, data such as mean age etc. are not reported as it might convey the unwarranted impression of generalizability and quantitative robustness (Walsh et. al, 2019).

2.4 Data Analysis

This study used thematic analysis (Braun and Clarke, 2006). They define thematic analysis as "a method for identifying, analyzing and reporting patterns (themes) within data" (p. 79). This definition supposes that an analyst produces a generalized understanding of coded data based on the recurring application of codes and the patterns associated with those codes. The frequency of the codes appearance in the data set, makes the analyst to decide that code as the basis of a theme. The analyst's perspective to thematic analysis inherently depends on the specific research questions they use to guide their study. Actually thematic analysis is a fundamentally question-driven exercise that depends on clearly articulated lines of inquiry to frame the scholar's interpretation of the data (Lochmiller, 2021). Codes are considered to be, "a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldaña, 2015:4)

As Riessman (2011: 311) noted, coding causes "detail and specificity to slip away in favor of general statements about the phenomenon of interest". Coding means that interviews and other data sources are "fractured" into smaller analytic bits that become the basis for "generalizations about human processes that hold across individual participants". This required the transcription of interview recordings and then careful reading by the interviewees in case there was any sort of misunderstanding and after this followed the coding stages.

3. Results

The analysis and the coding procedure produced four distinct themes:

(a) "Technical Problems"

Almost all participants mentioned very frequen poor connectivity problems which delayed the online learning procedure and caused a lot of stress to both teachers and participants:

P1(woman): "there were times that I almost felt like crashing the p/c on the floor because I couldn't listen to or see on the screen what was going on."

P9(man): "I live in a forested area where the bandwidth is quite low. I am many times cut off in the middle from the online session. I have made complaints to the telephone company but…nothing happened. Most of the time I have to go to my mother's house where the connectivity is ok".

P7(woman): "I really feel at loss when, and that happens quite often, there is no internet connection for an hour or so and I am cut off from my class".

(b) "Online Learning Problems"

Most participants (ten out of twelve) mentioned difficulties that hadn't expected and appeared during the online process. (i) Most of them often experienced communication/interaction problems both with their fellow participants and the teaching staff mainly due to the fact that they were not familiarized enough with the applications of the teaching platforms and they lacked the necessary skills because they had not received enough training or no training at all and (ii) almost all of them had more or less a kind of anxiety for the sudden transition to the online forms of teaching/learning and the fact that everything was moving too fast:

P3(woman): "it is very difficult for me to function and learn in depth and in a team if I don't have any eye contact with other people…..When I am following the teacher face to face I feel that I imprint his words into my mind"

P8(man): "It is very difficult for me to work in teams… to do team work if we are not sitting all together talking about what each one's contribution will be like. I am not used to working only via emails and platforms".

R5(woman): "I am not used to typing fast in the chat and I can't catch up with all the questions and sometimes there are misunderstandings between us because they can't be clarified quickly enough".

P10(man): "I really feel stressed when I think of myself in front of a computer for whatever kind of training I want to have and without any real contact with my fellow students. Even now after a year I still feel that I don't know anyone".

(c) "Online Teaching Problems"

Half of the participants (six out of twelve) mentioned difficulties with respect of the teaching process and the instructional design:

P10(man): " ..most of the teachers presented their material via power point presentations and rarely used e.g. break out sessions in order to do some team activity".

P11(man): " ..after the first three months I was very bored to participate online…really bored.. I wish we had some face to face interaction…I just turned off my camera and pretended to be listening".

P6(woman): " I have the feeling that the organization of the online provision could be better organized…nothing can be compared with the face to face teaching, but if we had more teaching techniques we would be more interested…."

P12(man): " …our teachers were doing their best but I think that they hadn't been trained for that sort of teaching"

(d) "Coping Strategies and Time Management"

Almost all participants mentioned that (i) they saved a lot of time with online education because they didn't have to commute, otherwise it would be very difficult to attend the face to face classes due to a number of reasons (ii) they developed coping strategies in order to study, revise and come to terms the online material they were assigned to:

P4(woman): "…do you understand…what it means for a working mother of two children to be able to come home mind the kids without having to commute to the classes…mind them.. do some bits pieces around home while listening to lectures. If it wasn't for the online shift I wouldn't have had both the time and the energy to follow the program".

P12(man): “My spare time is very limited…., fingers crossed, the training was online so I was able to manage my time come home and grab a bite ….while listening to the lectures…on my mobile. I was able to have some coffee and even participate to the discussion. If I had had to present in a room physically listening to the same stuff, I would have dropped it for sure. I don’t have the time to commute and waste. My time management was much better and I had time to study at least three times a week”.

P6(woman): “…Timewise it was the best training course I have ever attended. Lectures…notes ….not unnecessary comments…or useless conversations and discussions …. Saved a lot of money on petrol… I would have to commute for 30 km. If I could do a master’s degree this way...I would do it”.

P2(woman): “ …at the beginning of the course I was almost sure that it would be impossible to learn anything online...gradually I started reading the material over and over again ….trying to find similarities to what I already knew…. It wasn’t that difficult to learn it”.

P10(man): “…when I receive the material I study it carefully and then I start making diagrams and tables…then I start asking questions my self trying to guess what kind of questions I would ask my students if I were the teacher…I take them down and after some time I start revising” .

P2(woman): “…the fact that I don’t have to commute saves me a lot of time and three times a week I make sure that I study the material that has been presented. I even study the subject I really don’t like and I don’t think I will ever make any use of it ..but it is obligatory and if I want to complete the course I have to have it”.

P8(man): “… from the start I knew it wasn’t going to be easy. Gradually because I didn’t have to drive to and from I organized my study and when at the end of each week had some questions…didn’t know what to do I asked my fellow participants or email the teacher asking for advice or clarifications.. I never encountered any problems with my progress. The whole course taught me to be more organized and consistent with the course demands”.

It could be seen that almost all participants developed cognitive (rehearsal, elaboration, organization), metacognitive (ask my self questions) and resource management (time management, effort regulation, peer learning) strategies in order to cope with the demands of the course.

4. Discussion

As we can see the adult students have managed to various extent to come to terms with the emerging digitalization of the education and training, especially in Higher Education. Since the 90’s Kearsley et al. (1995) discussed the effectiveness and impact of online education in graduate education in the early days of the Internet. In the first decades of 20th century, online education was limited to few people of education community. Harasim (2000) emphasized this shifting of traditional to online mode of education. Delivering education with a new technology is a big challenge for faculty members as it might be compared with traditional system.

There are clear arguments for this transition: It provides better accessibility of tertiary studies to those who cannot attend classes in person – for personal reasons or decisions, because of geography or economic necessity.

With respect to the first theme e-Learning in Greece has its own particularities given the nature of the (mountainous) land and the fact that it has so many populated islands far away

from the mainland. It is a land of diversity and providing online education with appropriate technical infrastructure poses a challenge both for the public and the private sector.

Concerning the second theme it should taken into consideration that effective online learning depends on too many factors like presentation skill, content delivery, use of technology, etc. Crawford-Ferre and Wiest (2012) presented some effective practices in online instructional methods. Though online education is developing and changing quickly yet it has its own challenges (Swan, 2017; Kebritchi et al., 2017;). On the other hand, another researcher argued that students often encounter problems such as lack of self-discipline, suitable learning materials, or good learning environments when they are self-isolated at home (Bao, 2020).

With respect to the third and the fourth themes it shouldn't be ignored the fact that online learning does not provide a two way communication as compared to the traditional system. Learners develop their own style of learning in absence of continuous observations. Zapalska and Brozik (2006) discussed aspects of recognizing individual learning style in online learning. The students face major problems with remote learning as face-to-face communication facilitates more the learning process, presenting a better opportunity to sharing knowledge and asking for help, and is more interactive as well (Miliszewska, 2007).

It could be claimed that that online learning may offer an advantage for individuals who are unable to attend a traditional full-time face-to-face university /long term course due to personal or financial circumstances. Also, the flexibility of asynchronous remote learning may provide wider access. (Tesar, 2020).

Finally relating to the fourth theme, it has been argued that Self Regulatory Learning Strategies (SRL) are relevant to student performance in higher education contexts (Richardson et al., 2012). I has also become known from more recent research that students would utilise SRL strategies more often within an online learning environment (Broadbend, 2017)

5. Limitations and Future Research

In addition, other factors limit the generalizability of findings presented in this report. Specifically, conclusions derive from a small-scale qualitative study centering on a single class of a single /faculty. Consequently, it is unclear whether the observed outcome could extend across other online learning providers. This could demand further long scale mixed method research.

6. Conclusions

We could argue that what becomes evident from above small scale research is that a complete online course should include: (a) flexibly organized online instructional design which would support student learning, (b) effective provision of online instructional information (c) adequate teaching support; (d) promoting students participation to improve the development learning, and (e) technical support or alternative plans to cope with unexpected problems of online education Platforms .

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PRADHA (Teaching Resources Platform for Online, Blended, and Autonomous Learning)

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Abstract
PRADHA (Teaching Resources Platform for Online, Blended, and Autonomous Learning) is a project coordinated by Sorbonne University. Funded by Unisciel, the project consists in creating a bank of shared digital learning modules, that will have a brick structure allowing them to be reutilized in undergraduate science programs, implemented according to the use case scenarios depending on the needs of higher education institutions.
The PRADHA project is articulated around three actions:

- Creation of multimedia ressources
- Gather/build/reference MCQ for the self-assessment purposes throughout the training
- Offer the at-home practical labs: using smartphone, labs in my kitchen…

Learning objects, containing the videos, multimedia-rich slides, quiz and practical lab are used to build a blended or an online learning module.

The learning modules are managed via the online editing software, Scenari, allowing for collaboration. The process of editing and management of resources in Scenari represents a strength for the project allowing

- The authors to deliver the contents without mastering the publishing technology and to assure the multi-support product
- A greater simplicity in updates
- Provision of shared resources to which all the partner institutions have the copyright compliant access throughout the shared unified metadata.

Deployment of these resources during the period of teaching adjustment related to the Covid-19 pandemics situation, certifies their flexibility and the final goal of the process, that is, the appropriation and adaptation of resources, mutual utilization of the shared question bank, provision of the SPOC-type training module or the more targeted autonomous bricks….

Keywords: SPOC, autonomous bricks, Scenari, editorial chain.

1. Introduction (Calibri, 12 pt, bold)

PRADHA (Teaching Resources Platform for Online, Blended, and Autonomous Learning) is a project coordinated by Sorbonne University, funded by Unisciel. The project consists in creating a bank of shareable digital learning modules, that will have a brick structure allowing them to be reused in undergraduate science programs, implemented according to the use case scenarii depending on the needs of higher education

academy. Completely scenarised modules are created and played as proof of concepts for the students enrolled at the distant learning program.

The PRADHA project is articulated around three different points:

- Creation of multimedia resources
- Gather/build/reference MCQ for the self-assessment purposes throughout the training
- Offer the at-home practical labs: using smartphone, labs in my kitchen…

Learning modules, containing the videos, multimedia-rich slides, quiz and practical lab are used to build a blended online learning module.

The learning modules are managed via the online editing software, Scenari, allowing collaboration. The process of editing and management of resources in Scenari represents a strength for the project allowing:

- Content delivery by the authors without mastering the publishing technology and assuring the multi-support product
- A greater simplicity in updates
- Provision of shared resources with copyright compliant access throughout the shared unified metadata for institutional partners.

This paper aims to provide feedback on the implementation of the PRADHA platform within Sorbonne University and its benefits in a "real" situation. Indeed, the Covid19 pandemic has led to the "sudden" interruption of most on-site courses in higher education. This situation has made inevitable the use of distance learning and digital tools to ensure continuity in the training of students.

Therefore, this situation led to a favorable ground for the local expansion of the system. So, how did the teachers appropriate the system? How worked the national "collaboration" that aimed the PRADHA implementation? How did the students appropriate themselves the involved resources?

In order to better understand the interest and the limits of the device, we will first introduce the Pradha project and its environment. Then, we will discuss the scripting process carried out within the framework of the project. In the third part, we will focus on the feedback on the appropriation and the use of the teachers of the "scripted" modules or learning objects during the Covid19 period. In the last part, we will show the results of the use of the scripted courses by the students through a survey of opinion for a UE of physics " Electromagnetism and electrokinetics " for 6 ECTS.

2. Project frameworks

As part of its training policy and in response to a call for application from the Licenses College of Sorbonne University, the Faculty of Science and Engineering (FSE) has undertaken the development of SPOC (small private online courses) for the Bachelor's degree integration cycle (BA1). These projects, carried out by the Open and Distance Learning Department (ODLD), take active part of the project of Sorbonne University's educational renewal resources and course design. These multiple resources (pdf courses, self-correcting, pedagogical videos with quizzes or WIMS exercises) are accessible to distance students for several of our BA1 (Mathematics-Physics-Chemistry-Engineering) portals, and are intended to be widely used. The editorial choice made by FSE for the creation of its SPOCs allows the reuse of video resources despite possible modifications of the models, or bachelor contents diversity at national level due to their granularity. We can already

emphasize that some of these resources have already been reused in classrooms for hybrid teaching, and also after the changes made in our curriculum last year.

The PRADHA project pursues this development dynamic of digital resources by including the BA1 bank (Mathematics-Computer Science-Physics-Engineering) portal courses and then a part of the BA2 courses, reinforcing this shift towards hybrid teaching. This evolution was done through multiple actions. The first is the mediatization of the contents of seven courses, initially proposed in pdf format. The second is the creation of new video resources to complete and extend the offer. The third is the constitution of questions bank, with metadata allowing them to be classified by categories and levels, which will constitute a coherent set of self-assessment and remediation tests, usable continuously at the undergraduate level. The last additional component, which is completely innovative, is the design of practical work to be carried out by students at home, either using their smartphones, or using everyday equipment, or using digital tools (simulation, remote control).

All together, these developments provide a consistent set of resources. To allow their sustainability, fine granularity, rationalization based on thoughtful metadata, all scripted through an editorial chain is a strategic choice. The Scenari open source editorial chain, which was Sorbonne University's initial choice, offers this solid and flexible structuring of content.

Considering national level, the project is part of a larger system carried by Unisciel: LIcence SCIentifique NUMérique, (LISCINUM). LISCINUM is a common bank of shared, granular and reusable digital educational modules corresponding to the cycles of scientific licenses that can be implemented according to the scenarios of use according to the needs of the institutions. The objective is to share practices in terms of digital educational transformation of training courses that can be deployed on a national level after a local spin-off. This pooling of practices also involves sharing digital resources.

All the highlighted resources in the project concern basic knowledge, typical of first and second year undergraduate courses. It was therefore particularly interesting to develop this approach in the context of the LISCINUM call for projects, which in the long term will allow them to be pooled and therefore to hope for the complementary contribution of other institutions that could come and complete and enrich them.

3. Organization, process and structuring of contents:

3.1 Scenari's Choice

In order to create and structure the educational documents, we used Scenari. Scenari is the acronym for System for the Design of Editorial Chain for Digital, Adaptable, Reusable and Interactive Contents. It is a free software suite for the creation, structured editing and publication of multimedia documents. An editorial chain or publishing chain is the sequence of operations (or industrial process) by which a document written by an author is transformed into a publishable and published document. It consists of formatting the written document, developing document templates, and performing the necessary file conversions. Based on the WYSIWYG model, it has the advantage of automatically formatting the resources produced, which are therefore very homogeneous. This facilitates the industrial production of documents and collaborative work, despite of the documents author, the formatting will be identical, predefined by a document template.

Another advantage of Scenari is that it facilitates multi-format publishing: web (HTML), ePub, paper (PDF, OpenDocument Format...), XML. It is based on the principle of separation between the content and the forms

of publication. The writer adds markers to the content (XML tags) allowing computer programs to build documents by applying a set of rules for selecting and transforming the content.

Different programs can be applied to the same content to obtain different documents. For example, for a training module, different pedagogical supports can be obtained: slide show, trainee booklet, trainer support, exercise booklet with or without answers, SCORM module, web support...

Therefore, Scenari allows a good interoperability with any type of LMS (Moodle, Blackboard...) through the IMS-LTI and SCORM standard. Without any knowledge of HTML and JavaScript, Scenari also allows to build static websites that are auto-adaptive (responsive), interactive and respecting WAI-ARIA and WCAG recommendations to improve accessibility. For the scientific modules, the mathematical equations edited in LateX are displayed using the MathJax library.

Finally, the content is granulized. Each unitof text, image, video, exercise is an element that can be called up in several places or in several courses. It is therefore easy to maintain the documents. The update of an element, for example the modernization of a video, will be automatically propagated everywhere it is called.

3.2 LISCINUM Organization (Unisciel) - Pradha (FSE)

Unisciel use Scenari. A remote Scenari warehouse is accessible for all institutional partner financed by Unisciel, in order to centralize the production of educational contents. Each partner has a "Workshop[1]" which constitutes their production area. Each one deposits the resources produced. After a local spin-off and a technical and scientific validation by Unisciel, the resources are imported into the Unisciel resource bank and can be reused by the institutional partner.

In Pradha, teachers provide courses in the form of handouts and are mediatized in Opale2 by students in the form of learning objects characterized by text units. A learning object can contain one or more pedagogical units (definition, demonstration, example, remark, explanation...). These learning objects constitute a set of paragraphs composing a semantic unit that can be reused in other contexts. It is the smallest pedagogical unit of the course and must, in essence, address a single notion or concept.

The delicate points, initially identified as a result of the "teaching" experience, are taken up by short videos and produced with the audiovisual service. These "concept-video" have an average duration of 5 to 6 minutes. They are deposited on Scenari (Opale) as a block and nested in the grains to constitute a coherent scenario. The same is true for videos of practical work requiring a visual description of a procedure or the result of an experiment.

All of the grains articulated in an intelligible manner constitute the training module. The training modules can be similar to a chapter or part of a course. Each module is associated with a learning objective.

In order for learners to evaluate themselves, each module is punctuated by self-training quizzes filled in by the teachers. These questions are accompanied by metadata and specific feedback for each answer allowing for remediation.

[1] Workspace in the sense of Scenari

[2] Opale is a documentary model of the Scenari editorial chain.
Opale is used to create training modules that can be distributed on several types of media, which you can cut up for multiple uses.

A review of the modules is made by the teaching team before the module is submitted to Unisciel.

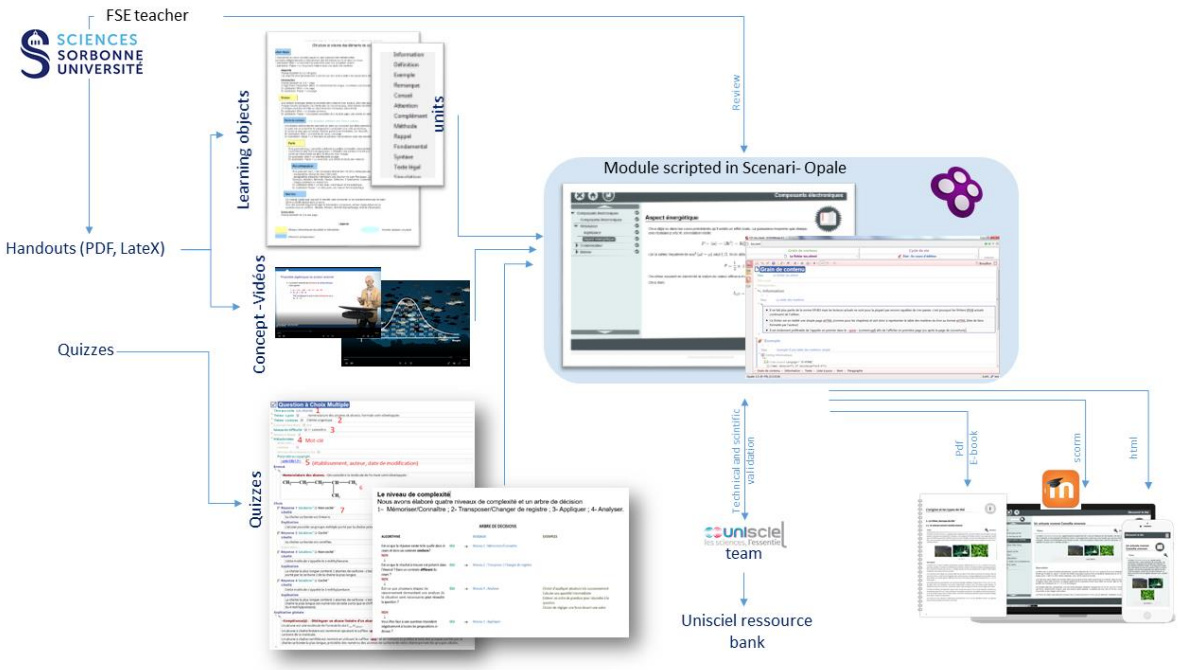

Figure 1: Pradha project process

A workshop (in the sense of Scenari) gathering all the questions of the training modules has been set up in order to facilitate the exploitation of the quizzes. A guide for writing questions has been edited to standardize and better organize the management of quizzes in the Scenari warehouse. Four levels of complexity following a decision tree were retained in order to define the level of difficulty of the question: 1- Memorize/Know; 2- Transpose/Change register; 3- Apply; 4- Analyze. Each MCQ must have between 3 and 6 answers and each answer must contain a specific feedback.

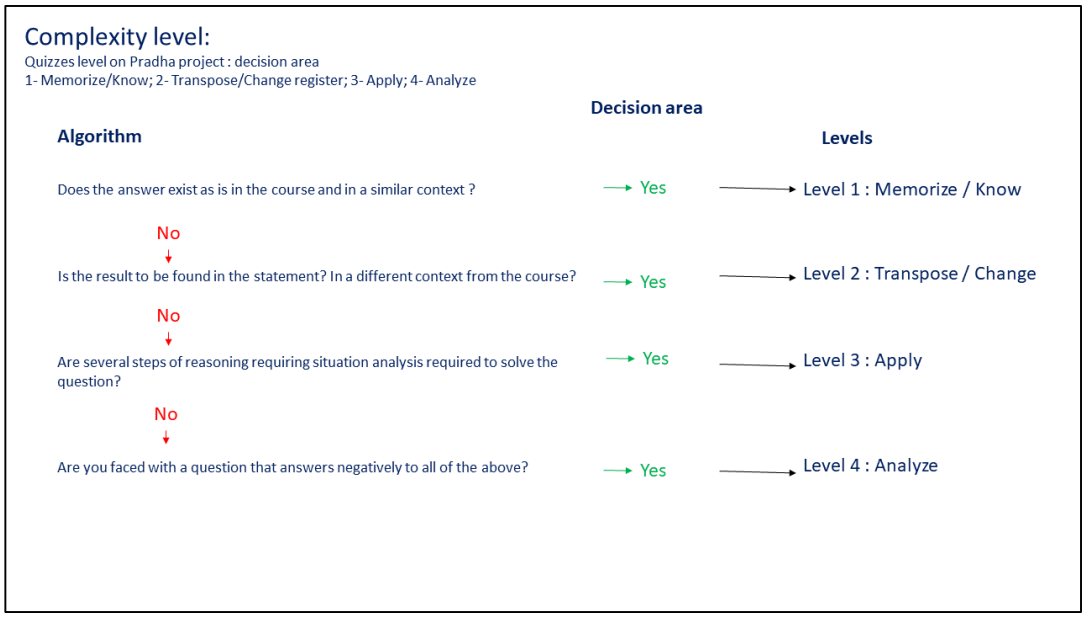

Figure 2: Quizzes level on Pradha project – decision area

Initiated in 2017 and for a duration of 3 years, we mediated, in Pradha: 7 courses representing 1700 pages of poly, produced 435 “concept-video” and 1227 questions (MCQ or SCQ). The project involved about 20 teachers, 1 Instructional designer 1 audiovisual director-editor, 6 temporary students, and an M2 intern for the student feedback part.

4. Appropriation of the modules during the Covid19 pandemic

The "sudden" end of on-site courses and the move to distance learning for all courses was an opportunity to spin off the training modules. However, the modules could not be transposed as such. Indeed, due to the reform of the mock-ups at the Bachelor's level, some modules mediated at the beginning of the Pradha project in 2017 either changed level (BA1 became BA2) or were attached to other disciplines or became a course in its own right (e.g. mathematics for physics).

This model change impacts at the level of the mediated course. Indeed, the basis of the scenario which was the handouts were not thought in a "granular" way. The latter presented several references or cross-references within the document. A rereading of all the modules and a readjustment of the modules were often necessary before the students could have access to them

In spite of the reform of the models and the "cross-referencing" effect, the granularity of the modules allowed for easy modification of the content and structure of the document; like bricks that could be moved to form a scenario. These new modules are then exported as SCORM files and uploaded to the Moodle educational platform. The choice of a pedagogical platform advocating a constructivist or socioconstructivist model, such as Moodle, is decisive. Scenari being an editorial chain, the course modules are built on an essentially transmissive learning model, based on information processing and declarative and procedural memory. The resources as such, to be effective, must therefore be integrated into a broader pedagogical strategy allowing the student to interact more with his documentary environment, but also his social environment composed of teachers and peers.

One of the great strengths of the project is the pooling of produced resources at national level. Unisciel, in partnership with 45 universities, has a pool of resources: quizzes, training modules, videos produced by

teachers/researchers. All content is distributed under a Creative Commons BY-NV-SA license (Attribution + Noncommercial + Share Alike (BY NC SA). By adhering to the process, the rights holder authorizes the exploitation of the original work for non-commercial purposes, as well as the creation of derivative works, provided that they are distributed under a license identical to that which governs the original work. The authorship is also indicated for each resource produced to ensure traceability. Access to the resource bank is managed by Unisciel and is provided by a simple request made by e-mail. The requested resources are then made available in the workshop (in the sense of Scenari) of the university to which the requesting teacher is attached.

During the Covid period, the pooled resources were a real opportunity for teachers who, caught up in their time, could not create these resources such as videos, animations... Tests were thus constituted through the bank of mutualized questions. It is the same for the videos of experience...

Scenari also proposes, through the mediated version of the course, to build two versions of the document: a standard version (long) and a short version. For example, in the Chemistry - Atomics and Molecules course, the teaching team has set up a "summary" version of the course that covers the essential elements available to students.

4.1 Student feedback:

During the Covid 19 period, only two courses fulfilled the conditions required for local spin-off. The conditions were: content mediatization completed and reviewed by the teaching team, videos available and quizzes attached to the modules.

We can take the physics course "Electromagnetism and electrokinetics" to illustrate the students' feedback. The latter was deployed rapidly and we were able to evaluate through surveys with students the perception they had of the device; both in terms of usefulness, usability and user experience with regard to their online experience. Taking into account the exceptional situation, this feedback remains exploratory. The aim is to identify avenues to be explored in greater depth by means of quantitative surveys of a more significant audience in order to better understand how the mediated course can have a positive impact on learning.

Note that the course modules scripted in Scenari-Opale have been integrated with the SCORM standard in Moodle in order to centralize the resources for the students on a single platform. In the "Electromagnetism and electrokinetics" course, the modules were added to PDF documents, videos and quizzes that were already present in the course.

In order to analyze the perception of the scripted courses by the students with regard to their practices and the difficulties, they encountered in distance learning, we carried out a cross survey using data from several sources:

- the logs on Moodle of the "Electromagnetism and electrokinetics" course
- a survey carried out with students during first semester through the Moodle survey tool
- a questionnaire carried out with 29 students targeted for having used the Scenari-Opale modules
- interviews with seven second-year physics students enrolled in the ODLD and in the classroom, but all of whom had experienced the online courses as a result of the humanitarian situation.

For this study, the students' perception of the course modules is based on interviews. We added some answers to the questionnaire sent to the students using the resource, to complete our analysis.

The survey asks students about the pedagogical tools offered, synchronous sessions in videoconference and digital resources on Moodle. Two questions in the end-of-semester survey concerned scripted courses. In order to encourage students 'participation we made access to the annals conditional on the completion of the "Survey" activity in Moodle (conditional path). 202 students out of 323 participated in the survey.

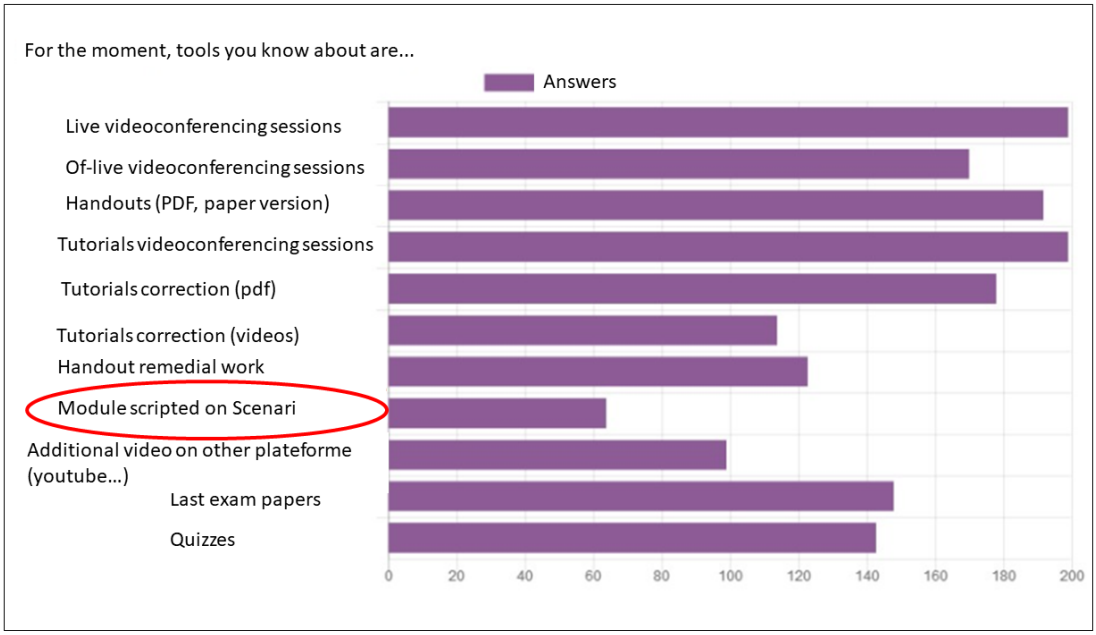

Figure 3: Tools known by students

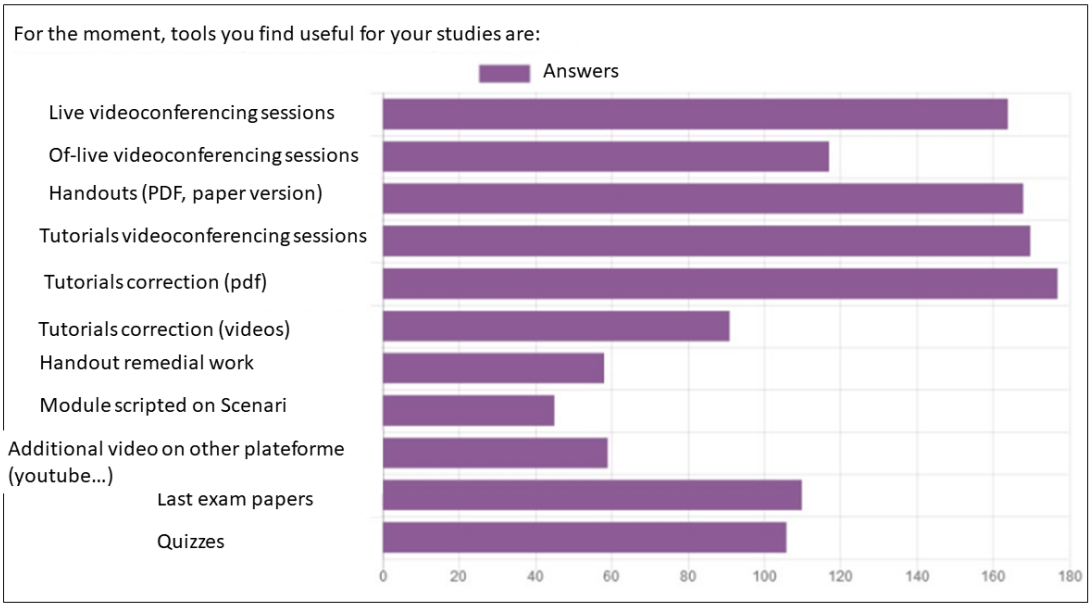

Figure 4 : Tools used by students

During the Covid period, the massive recourse to video-conferences and the deposit of PDF on MoodleSciences3 was the rule. This was done because of a vision of direct transposition from classroom to

[3] Educational platform of the Faculty of Science and Engineering

distance learning, not only for organizational reasons, but above all because of a lack of knowledge of the deployable devices for distance learning.

At the student level, almost all students who responded to the survey attended classes and tutorials via videoconferencing, i.e. live or synchronous. This proportion is higher than the attendance generally observed in the classroom. In comments and interviews, students stressed the importance of live lectures and associated it with the fear of failing. Indeed, the video-conference sessions were the only time of exchange with the teachers and the only social link that connects them to the University. This state of affairs confirms the paradox mentioned by Franck Amadieu (2021) who emphasizes that "learners sometimes prefer to work with the tools and in the conditions that are least effective for them as long as they find a reassuring framework to compensate for the absence of social relations or do not know of any other learning modalities that could replace it".

In this transition to distance learning, the synchronous course devices quickly find its limits: the time devoted to learning. In addition to the synchronous sessions, the time for assimilation and revision was never taken into account. Distance learning requires a learning strategy. It requires more effort on the part of the students, who must find information on the course and answers to their questions. They spend more time searching the resources available to them, on Moodle and on the Internet, questioning their peers and possibly the teacher.

The students spontaneously defined a learning strategy based on time management and prioritization of knowledge acquisition.

Although resources were made available in a variety of formats, PDF was the most widely used. In interviews, students mentioned the importance of progressing at their own pace and having the resources available without digital constraints. The handouts are comprehensive and meet this need. However, some notions or concepts in mathematics or physics are difficult to grasp. There is a lack of spatial representation of the elements covered. For certain elements of the course, videos were used as a support to make up for this lack. In the classroom, the speech is enriched by the teacher's body language and non-verbal actions that provide additional information, for example on the importance of a term, on the relative position of certain elements ... but also serve as a kind of cognitive tool to help memorization, a bit like a mnemonic method that gives a sense of reading, better follow the path of his thought or reflect with the teacher.

Concerning the Scenari-Opale scripted course modules articulating texts, figures, videos and quizzes, opinions are mixed. On the positive side, the modules have been judged pleasant because they correctly articulated the needs of the course. There is no need to juggle between different windows, to spend time recomposing the course, to find the right video that goes to such and such place. Even for the figures, the reading is facilitated by the use of the illustrated text item in which the figure is clearly associated with its explanation instead of a reference sometimes on another page. The breakdown thus facilitates understanding. In the classroom, the teacher articulates the notions, indicates priority and precedence relationships, gives examples, and insists on what must be revised as a priority for the exam. He also gives the rhythm in the course. The division into chapters, sub-chapters and grains, gives the rhythm to the students, the identification of the types of statements, definition, remarks, examples, exercises, enhances the content. The presence of diagrams and videos at the right time, illustrates the subject.

However, few students invested in these scripted modules. The first cause mentioned during the interviews was the availability of resources only online and on the Moodle platform. The problems mentioned were not material, but the path to access the resources: turning on the PC, authenticating, accessing the course,

ensuring a good internet connection, browsing the module... The module, dropped as a SCORM package on Moodle, allows information to be fed back to the LMS platform, such as indicators for monitoring the learners' journey (pages viewed, percentage of progress in the module journey, completeness, time spent), the last page viewed by the learner and the monitoring of quizzes (answers entered to questions, scores obtained, success according to the defined threshold). The big drawback is that it takes three clicks to access the content. Moreover, once connected and thus open to the world, the temptations (social networks, entertainment channels, games...) make it difficult to concentrate on a task. Especially since it was the only way to maintain a virtual social relationship.

The second explanation of the fact that few students interacted with the Scenari modules is unfamiliarity with the tool. The modules were presented through small paragraphs in Moodle with a reminder via an email sent to the students. Six modules were posted in the course. Of the 323 students in the course, 42 students posted at least once and 12 students completed at least one module

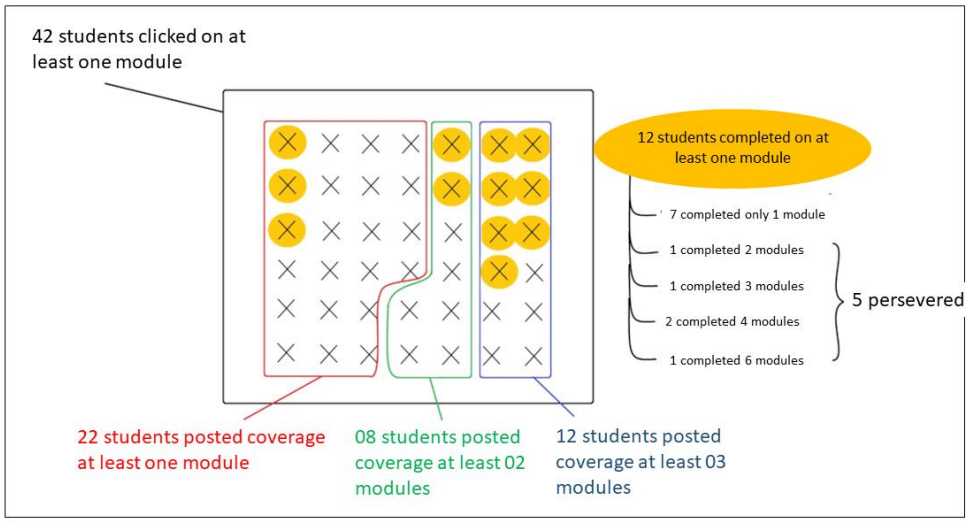

Figure 5: Survey sampling - Student using Scenari modules

Students who used the modules were using them as a supplement, not as a primary resource.

In terms of feedback from students who have used the Scenari-Opale scripted modules, many acknowledge the quality of the resources. The few students who responded to the questionnaire appreciated the scripted courses because the content was broken down and seemed less dense and the simpler navigation made it easier to find the important points of the course. However, they did point out improvements that could be beneficial to independent learning such as; the ability to work offline, the ability to annotate and highlight.

Overall, all the students interviewed agree that resources in digital format only make sense as a complement to the existing traditional format (paper). The main interest of the digital format (video, animation...) is to make static content more dynamic and lively. Despite the quality of the resources and activities offered, all the students on the panel agree that there can be no anchoring of knowledge and progress without the support of the teacher. The teacher's role is essential here, as he or she is seen as the guarantor of effective learning

5. Conclusions

Distance learning is more complex than on-site courses because there is a loss of human mediation which is difficult to compensate for. It is even more difficult because it has been undergone. It requires a lot of personal work developing autonomy at the risk of losing some students who will not be able to produce the extra work that this entails. We can provide personalized help, accompanying students so that they remain in their proximal zone of development, by offering them an environment rich in information in which they can find the help they need. In this sense, the scripted course modules with Opale are of interest provided that they are easily accessible, i.e. available offline. The mediation of courses with Opale from Scenari can thus bring help to students and can be qualified as technical mediation.

Deployment of these resources during the period of teaching adjustment related to the Covid-19 pandemics situation, certifies their flexibility and the final goal of the process, that is, the appropriation and adaptation of resources, mutual utilization of the shared question bank, provision of the SPOC-type training module or the more targeted autonomous learning objects…

Creating 'granular' resources requires organization and thinking. It's necessary to think usability of resources over time, nesting and deployment. Each resource respond to a specific block of knowledge and must be validated by an evaluation (summative or formative).

This method saves time in modules recomposition. It allows us to benefit from "tested" and "validated" modules due to local spin-offs.

For students, modules articulation makes courses reading easier. It makes it possible to determine the essential elements. The breakdown of the modules facilitates understanding. « Video-concept » explains the "diffuse" elements, allowing a better understanding of the concepts. Despite the richness of the modules, reading the resources alone does not, according to the students, guarantee the acquisition of knowledge. The role of the teacher in the program is essential and specifically the teacher–student interaction.

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Diversity & Inclusion in Open & Online Education

Inclusion of Students with Disabilities at UNED. Lessons Learned

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Abstract
The National Distance Education University has a proven track record in caring for people with disabilities and special needs. With the conception of the Centre for Support to University Members with Disabilities in 2007, a phase of institutionalisation of all the processes of diversity inclusion began. With more than 8,000 students with disabilities in the year 2020-2021, UNED offers an experienced institutional benchmark for inclusion. Although most students with disabilities are studying undergraduate studies, we also find great diversity in many fields and trainings. This trajectory has meant the development of an institutional framework for the care and promotion of people with disabilities. The centre has generated procedures and processes to solve the problems of reasonable adjustment, as well as care to all the universal design processes that are underway. The institutionalisation processes are not disconnected from the problems that the formalisation and professionalised organisation of activities entail, however it also implies a framework of protection and guarantee that would not be obtained through more spontaneous and informal care. The model has been branded by its own praxis with a distribution of functions and tasks among all agents and services of the university. In this framework, UNIDIS is the engine, guarantor, and promoter of inclusion without monopolising at any time all the processes that must stay in each of the services or units that carry out a task guaranteeing inclusion in them, universal design, and accessibility. These significant challenges reflect a rapidly changing and transformative framework connected to social, economic, and academic stress.

Keywords: Higher Education, Disabilities, Inclusion, Lessons Learned.

1. Introduction

We understand that the university is an institution that Velasco and Díaz de Rada point out in their work "The logic of ethnographic research" (2010) as a form of social action in which agents put into play bureaucratic devices that rationalize, from a conscious organizational theory, social life. Years earlier, Max Weber already pointed out that our social life was developing in a highly rationalized and bureaucratized world that reaches almost all our areas of experience.

However, this excess of bureaucratization in social relations is typical of highly formalized systems such as the university and coexists with informal channels in which social relations flow spontaneously. In the university, there are strict bureaucratic rules, however people who work in it, with their daily work, enable the daily

experience of those who access its services. An inclusive university aspires to be accessible to all. The etymology of the word already contains these premises: *universitas*; universal; all.

Anthony Giddens published a book in 1994 entitled "Consequences of Modernity", in which he developed the notions of trust and risk in institutionalized societies led by expert systems. He defined these expert systems as systems of technical achievement or professional experience that organize large areas of the material and social environment in which we live. In the encounter between the rigid norm with its professional protocols and the practical realization of the user agents, a place appears, a space that Giddens calls: the *access point*. At the access point, there is a connection between lay people or users, and professionals, and where commitments take shape. On this premise, it is necessary to reflect on what is the space in which the notion of inclusion occurs in a practical way. The university is a clearly formalized institution, however in its practical expression, it is an access point where people who want to access and people who facilitate access converge. The trust that agents place in these experts and the risk of seeing their expectations fail, plan on this fragile relationship.

2. The National University of Distance Education (UNED): Paradigm of Inclusion

At the beginning of the 70s, the Free Distance University was created, which was renamed, in 1972, the National University of Distance Education. Many have been the transformations that this recent university has been experiencing, however without a doubt, what has not changed is in its spirit of search for inclusion. Although its original objective was to bring the university closer to those populations far from the university centres of the capitals, as well as to offer a possibility to those people who, due to their work or other occupations, did not have access to the face-to-face university, the truth is that it also became the inclusive university *par excellence* for people with disabilities. Not surprisingly, one of the main objectives of the UNED is to guarantee equal opportunities.

At the beginning of its journey, the means available to the new-born university were limited. Through the centres all around Spain and abroad and, after the implementation of the broadcasting plan, radio, and television, the UNED managed to reach an increasing number of students. It was not until the 90s when technologies were incorporated into the teaching model: multimedia materials as a complement to study textbooks. From 2000, the emergence of the Internet meant the great transformation making disappear or blur the distance between students and their school.

The UNED is today the largest university in Spain and houses the largest number of students with disabilities: 8,434 in the 2020-2021 academic year. These students are distributed in the different partner centres in Spain and abroad.

1.1 Social responsibility at the UNED

If we said at the beginning that the main objective of the UNED was to guarantee equal opportunities, there is no doubt that this ideal of equality is absolutely related to inclusion. The UNED is a university committed to the most vulnerable groups, offering educational services with a social commitment. Since 2008, diagnostic reports on Social Responsibility have been carried out detailing the impact of the activities carried out by the UNED and the needs for its development.

According to the *V University and Disability Study* (Fundación Universia, 2021), it is necessary to evaluate the indicators that measure the degree of disability inclusion in Spanish universities. It should be borne in mind that the percentage of University Members with Disabilities represents 1.5% of the total number of students. According to this study, of the 19,910 University Members with Disabilities in Spain during the 2019-2020

academic year, 7,886 students studied at the UNED. In the 2020-2021 academic year, the figures have increased to a total of 23,851 University Members with Disabilities enrolled in Spanish universities, of which 34.98% belonged to the UNED, which gives it a leading position. This represents a major challenge for a university that is defined in terms of inclusion and equal opportunities. This goal is in line with the Incheon Declaration and the Framework for Action for the realization of Sustainable Development Goal 4, to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all, within the Education 2030 Agenda.

As noted in point 7, Incheon Declaration asserts (p. 7):

> *Inclusion and equity in and through education is the cornerstone of a transformative education agenda, and we therefore commit to addressing all forms of exclusion and marginalization, disparities and inequalities in access, participation and learning outcomes. No education target should be considered met unless met by all. We therefore commit to making the necessary changes in education policies and focusing our efforts on the most disadvantaged, especially those with disabilities, to ensure that no one is left behind.*

3. Services for Students with Disabilities

According to the study by the Universia Foundation, among the 61 Spanish universities that participated in it, 58 of them have specific services of attention to students with disabilities. It is important to emphasize the budgets that universities allocate to these services of attention to students with disabilities. According to the same source (2021), 37% allocated an amount that did not exceed € 30,000 and only 6.6% allocated an amount greater than € 120,000.

3.1 Centre for Support to University Members with Disabilities of the National University of Distance Education (UNIDIS-UNED)

We started by talking about the power of institutions in organizing people's lives, and how trust and risk turn out to be the substrate of this relationship that is expressed at the point of access. At the UNED, that access point that Giddens defined, between the institution and students with disabilities, is the Centre for Support to University Members with Disabilities. UNIDIS merges the commitment of experts and the trust of users.

The main objective of the Centre for Support to University Members with Disabilities (UNIDIS) is to normalize the lives of university members with functional diversity by offering them the same opportunities as the rest of the university community of the UNED. Among its functions are to coordinate and develop promotion, advice, and support actions. These functions are concretized in the specialized attention to members on their cultural, academic, and professional development, providing them with the appropriate methods of adjustment of the teaching and learning process. Information, advice, and guidance are also provided to students on academic alternatives, information on enrolment, advice on grants and adjustments, as well as advice on professional alternatives. Another function of UNIDIS is to promote awareness through volunteer campaigns. UNIDIS also serves the other members of the university community as workers.

In addition, UNIDIS is the bridge that unites students with disabilities with the rest of the university's institutions, updating and creating statistics related to students with disabilities of the UNED; preparing an annual results report and collaborating with other UNED services to improve information for students with disabilities. In this sense, it is worth mentioning the management of the adjustment of the teaching-learning and evaluation processes.

Students with disabilities enrolled at the UNED are grouped into different types of disability, data that is only required for those cases in which adjustments are requested. The distribution of students according to the type of disability is as follows (Figure 1).

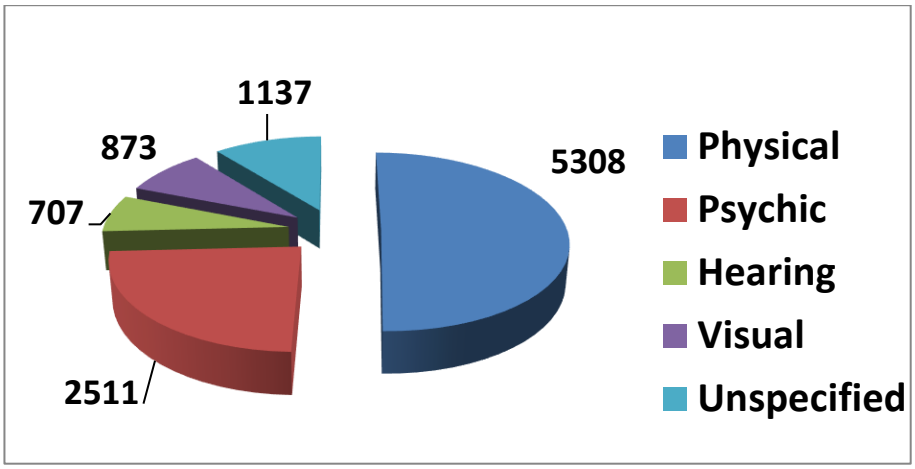

Figure 1: General enrolment at UNED and Enrolment of students with disabilities from 2005 to 2021.

It should be noted that disabilities related to physical and motor difficulties are the most predominant, although not all require special adjustment measures.

The number of enrolments of students with disabilities has increased slightly in the 2020-2021 academic year, going from 7,947 to 8,434 people, in accordance with the general trend of the UNED. This trend has been repeated in recent years as can be seen in the following graph (Figure 2).

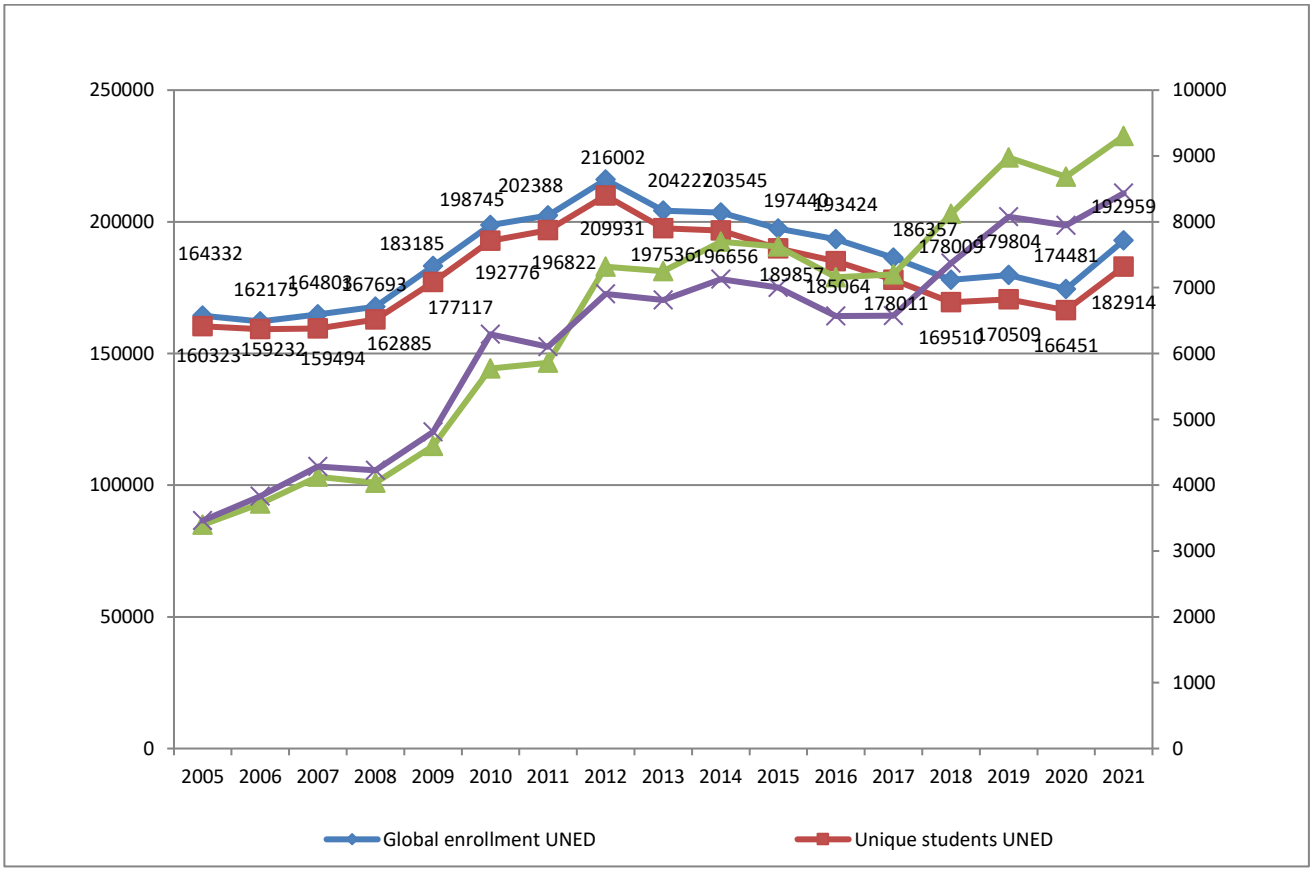

Figure 2: General enrolment at UNED and Enrolment of students with disabilities from 2005 to 2021.

The data on the number of graduates with disabilities in the last 12 academic years at the UNED, reflects the increase in visibility of the success of the group. Data are given below.

Table 1: Graduates from 2010 to 2021 at UNED.

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Graduates	111	184	156	145	200	215	219	231	242	234	167	296

Adjustments of teaching, learning, and evaluation processes

One of the main tasks carried out by UNIDIS is the management of the adjustments of the face-to-face exams of students with disabilities for the exam calls of February, June, and September. This process begins with the application by the student, their subsequent evaluation, decision making, and communication of the adjustments. To this end, forms and reports are prepared in addition to collecting data on the methodology and evaluation criteria of the subjects of the different curricula of the UNED. As part of this process is mediation with teaching teams, centres, and administrative units, guiding the development of adjustment measures. Students with disabilities receive telephone support in cases where incidents occur during the development of face-to-face exams, as well as the processing of such incidents. Support is also provided in cases where the student must take the exam at home or in other places such as hospitals and the services of sign language interpreters granted for tutorials and face-to-face exams to deaf students using sign language.

There are 10 different categories of adjustments available, although the most frequent are the following:

1. Different location for exams
2. Support or assistance from the evaluation commission
3. Furniture and/or adapted material provided by the Centre
4. Computer support provided by the Centre
5. Exams adapted to time or other modalities
6. Technical aids or adapted material provided by the student
7. Answers to the exam by the student in other media
8. Exams with enlarged font
9. Accessibility to the Centre
10. Exams in other media

The adjustments granted must be prepared for each of the exam calls and in each of the two weeks in which they take place. During the 2020-2021 academic year, 349.35 hours of interpretation in sign language have been covered. This service is provided in different circumstances such as institutional events, weekly tutorials, videoconferences, courses, internships, participation in representative bodies and in face-to-face exams. In

the following graph you can see the evolution in the granting of adjustments between 2010 and 2021 (Figure 3).

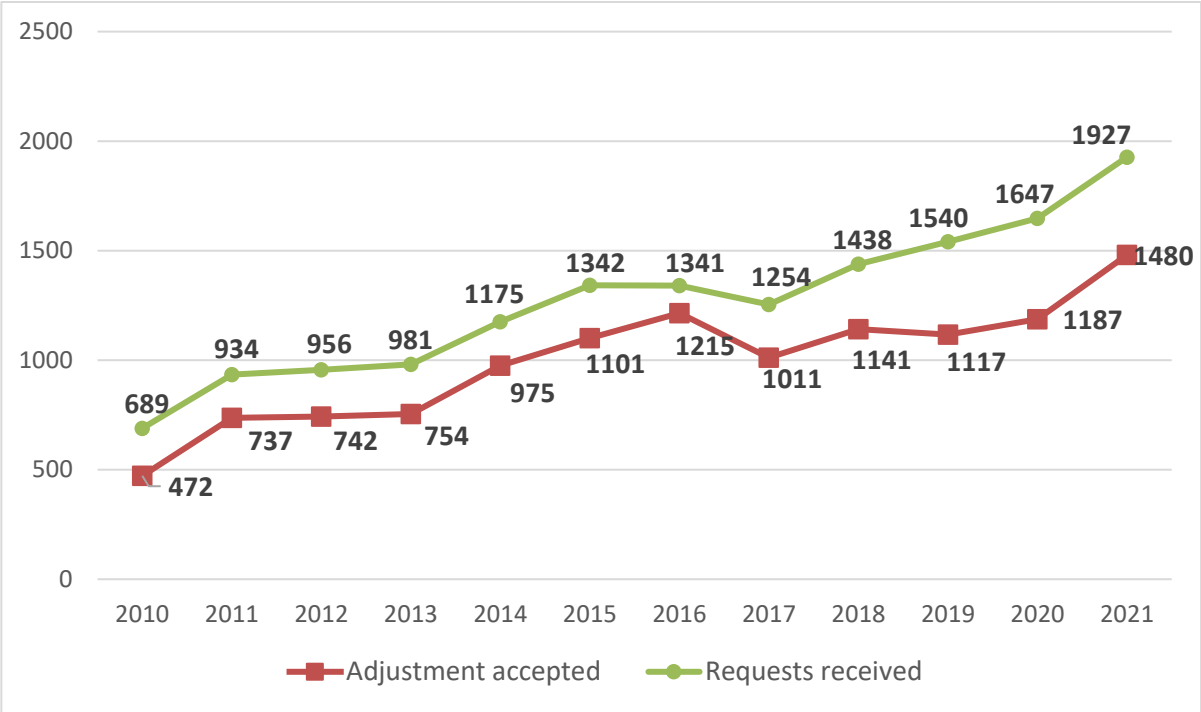

Figure 3: Requests received to ask for adjustments and accepted ones from 2005 to 2021.

Special difficulties occurred during the pandemic caused by COVID-19, a circumstance that led to a series of changes and the appearance of new forms of remote assessment and new examination tools, such as the platform known as Avex or online examination. This innovation was a challenge for our university, both technically and humanly. The haste with which it was necessary to act in the first moments was reflected in the impossibility of expanding the accessibility functionalities offered by the platform on screen, limited to aspects such as size adjustment, narrator, high contrast, etc. In response to the difficulties raised, students with disabilities were given the option to use this new tool or maintain their right to the face-to-face exam with the adjustments, as had been done before the pandemic, taking in these cases the appropriate sanitary measures.

But the pandemic hasn't just had consequences on students with disabilities. The UNIDIS team has also had to adapt quickly to this new circumstance. Accustomed to handling printed documents, they had to accept the challenge of digital adjustment management. This posed the challenge of undertaking the digitalization process.

4. Lessons learned

6.1 The increasing participation

The participation of people with disabilities, and their access to university has been growing during the last 18 years and will continue to do so according to all the indicators we have in our university, and in Spain in general. This phenomenon is approximately triple in distance education than in face-to-face university, and is a challenge that we must attend to, and take care of to really respect the right of people.

6.2 The increasing awareness

People with disabilities are increasingly aware of their rights and will use the appropriate channels to exercise them. It is necessary to provide for the mechanisms of participation, and regulation to make them effective, and correct the errors that can be detected. They should be corrected in situations where legislation is breached in any of its aspects by also establishing hierarchies, and priorities for action in the interests of efficiency, and success of the transformation.

6.3 The quite universal solution

Universal design is an effective, and cost-saving solution, although it does not solve all the problems of inclusion. This strategy has become especially relevant in the digital field due to the technological transformation that affects the whole society. In this way, we must provide complementary solutions for situations due to the digital divide, the harmful health effects of technology such as hypersensitivity, or the difficulties derived from the motor limitations of some people. It can be said that the strategy must focus on content, and media, however, also continue to consider people, their contexts, and their features.

6.4 The relevance of human role

Personal support, and human interaction are substantial agents within the development of the inclusion strategy. It always implies the possibility of regulating, complementing, or motivating the participation of people with disabilities. A proactive human environment facilitates and complements a design strategy for all people so that it motivates participation, monitors processes throughout their development, and facilitates the solution of problems, and the overcoming of obstacles, and difficulties when they occur.

6.5 The needed reasonable adjustments

It is necessary to continue to maintain a good catalogue of reasonable adjustments to complement the universal design, and respond to the specific, and local needs of each of the people when they display themselves. Its use will be reduced as the design is improved for all people; however, its application is unavoidable for the sake of a reasonable, economically, and technically sustainable strategy. In that sense, the value of some traditional means that will only be accessible through parallel, complementary, or adapted strategies for their possible use must be considered.

6.6 The still needed positive actions

Positive actions are still necessary today as they motivate, and open doors to people with disabilities, generating better expectations, and possibilities for access, and self-development. The knock-on effect of positive action measures such as free enrolment should be foreseen. It leads to an increase in enrolment in formal training when many people, who use training as a kind of leisure, or satisfying activity, could better participate in non-formal training for that purpose.

6.7 The role of rules

Regulatory frameworks should be clearly defined and disseminated for general knowledge. In this sense, transformative strategies should be foreseen supported by the application of legality, as well as by negotiation, and personal conviction to include as many people as possible in the transformative process.

6.8 The relevance of specialized services

The role of specialized services is critical in this process of transformation, and maintenance of inclusion. However, the strategy of distribution of roles and responsibilities among the whole university community is essential to make the process sustainable and participatory to achieve a culture of inclusion.

6.9 The connection with the university mission

Research and its dissemination, as well as training and innovation, are also fundamental strategies in the development of inclusion, especially in the university community that has these strategies as fundamental missions of its identity, and development. Research generates knowledge to base decisions and to design strategies. Training qualifies people through a nice, solid way. Innovation transforms the actions by motivating, progressive means. Dissemination values and socializes the achievements of the university community.

6.10 The communication and participation of the community

The communication and participation of the community of people with disabilities both individually and through the associative movement allows oxygenation, and generates dynamism, and dialogue with society, which will result both in the strength of the university strategy, and in a safe contribution of the university to society.

6.11 The general growing conviction

In general, one can observe a growing conviction of institutions and companies towards inclusion, and respect for diversity. This movement is manifested through actions, events, conferences, celebrations, regulations, publications, quality seals, calls for grants, scholarships, funding, etc. The university must be alert to maintain the scientific character of all the strategies and contents that are promoted and become visible to achieve an understanding as human and social as possible.

6.12 The relevant role of the language

Language plays a substantial role in all communication and dissemination strategies for inclusion. However, effort must be balanced to achieve a harmonious development of shape and content. The excess of formal perfectionism can lead to a loss of conviction, and activism in the transformative content that is, on the other hand, the ultimate, and real end of inclusion. To involve the majority and not lose weight, the content and purpose of the processes and strategies must be highlighted.

5. Conclusions

The development of inclusion in the UNED reveals that the processes are constantly changing. This growth remains constant over time and is also a reflection of the awareness of the right in people with disabilities. Faced with reasonable adjustment strategies that we need to maintain for many practical reasons, universal design becomes the solution that best foresees, makes possible, and cheapens the processes of access and development of training. However, the human being will continue to play an important role in all the phenomena of motivation, problem solving, and support for people with disabilities. At present, positive actions are still needed to motivate and involve people with disabilities in their proper measure. A good package of rules needs to be developed and made known in order to make the community as a whole aware of the need to remove obstacles and promote inclusion. In this inclusive process, specialized services for the care of persons with disabilities play an essential role in guiding the promotion and sustaining of all the procedures involved. It is important to connect transformation strategies with the mission of the University especially research, dissemination, training, and innovation. The involvement and dialogue with the community of people with disabilities both individually and in an associative way always gives good results. Currently there is a global process favorable to inclusion in both the public and private, business, and associative sectors. Finally, we will comment that, although language plays an important role in the transformation of consciences, it should not prevail over the inclusive content itself that is the ultimate purpose of the entire development of this inclusive culture.

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Micro-credentials for continuous education (Short Learning Programmes and MOOCs)

Analysing students' rating of the SLP Digitally Competent Educators

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Abstract

This article uses student feedback to examine the perspective of participants in the short learning programme (SLP) pilot Digitally Competent Educators (DCE). This SLP was targeted at the continuous professional development and lifelong learning for educators at various levels and several education areas. Student feedback was collected in 2020 using anonymous surveys at the end of each course. This implies that respondents were those participants who completed the course. Feedback, used on further development of

the SLP, focused on the content and implementation of the course modules. The SLP followed the design guidelines produced inside the E-SLP project and was based on the Digital Competence Framework for Educators (DigCompEdu) published by European Commission's Joint Research Centre (2017). This SLP combined six competence areas of DigCompEdu and aimed to develop and foster educators' digital competences in teaching and learning. DCE was developed from 2019 to 2020 in collaboration with the University of Jyväskylä (coordinator), Finland; FernUniversität in Hagen, Germany; Anadolu University, Turkey; and Universidade Aberta, Portugal.

Keywords: DigCompEdu, online short learning programmes, international collaboration, student feedback, continuous professional development

1. Introduction

There is a clear need to increase the provision of flexible and scalable academic studies and to support the continuous professional development of adult learners (Henderikx & Jansen, 2018). The European Short Learning Programmes project (E-SLP-project) answered this call by developing further a concept "short learning programme" (SLP) covering EQF levels 6 to 8. Within the project, an SLP was defined as a stackable and scalable course which is organised online (or in units, modules, learning building blocks) with a common subject and study load varying from 5 to 30 ECTS (Maina et al., 2020; Melai et al., 2020; Truyen et al., 2020).

The E-SLP-Project was funded from 2018 to 2021 under Erasmus+ Programme, Key Action 3: Support for Policy Reform, Initiatives for Policy Innovation, "Forward Looking Cooperation Projects" and coordinated by European Distance Teaching Universities (EADTU). As a part of the E-SLP-project, several short learning programmes were created and piloted in from 2019 to 2020 in collaboration with EADTU member universities (Melai et al., 2020; Truyen et al., 2020). Digitally Competent Educators (DCE) was developed as one of these pilot SLPs. It was based on three 5 ECTS modules, the workload of each module being 135 hours and the duration of a module varied between eight and ten weeks. Planning and implementation of DCE was done following "Design guidelines for flexible and scalable SLPs" created by the E-SLP project (Maina et al., 2020) and in collaboration with four institutions (Figure 1). DCE was embedded into an existing degree programme at each of the four institutions. Modules were planned in a manner that allowed their completion either individually or as a short learning programme (Henderikx et al., 2021). After each module was complete, feedback from the participants was collected by an anonymous survey questionnaire focusing on the content and implementation of the module. These data are analysed and discussed in this article.

Figure 1: Universities responsible of E-SLP "Digital Competent Educators" (15 ECTS): University of Jyväskylä (coordinator), Finland; FernUniversität in Hagen, Germany; Universidade Aberta, Portugal; and Anadolu University, Turkey.

1.1 Digital Competence Framework for Educators (DigCompEdu)

The SLP Digitally Competent Educators (DCE) focused on educator-specific digital competences needed in various levels of education and in several education areas. Content planning of this SLP was based on the Digital Competence Framework for Educators (DigCompEdu, Figure 2) published by the European Commission's Joint Research Center (Redecker, 2017). This framework includes a cumulative model where a participant is proceeding from a lower to higher proficiency level towards expertise.

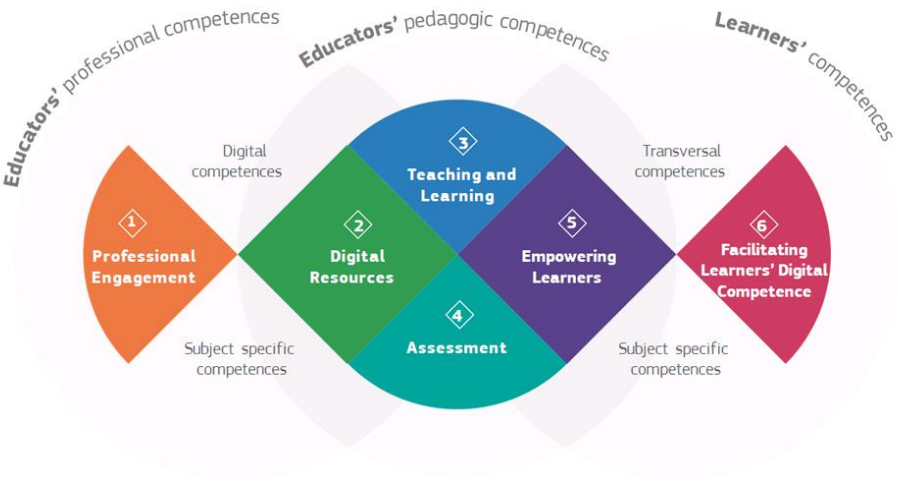

Figure 2. Digital Competence Framework for Educators by European Commission Joint Research Centre.

DigCompEdu framework identified six different competence areas with a total of 22 competences. DCE combined these competence areas in a new and innovative way. Competence areas were divided into three modules (Figure 3), with each module addressing a specific level of expertise within the framework – from newcomer to explorer, from explorer to integrator, and from integrator to expert (Redecker, 2017).

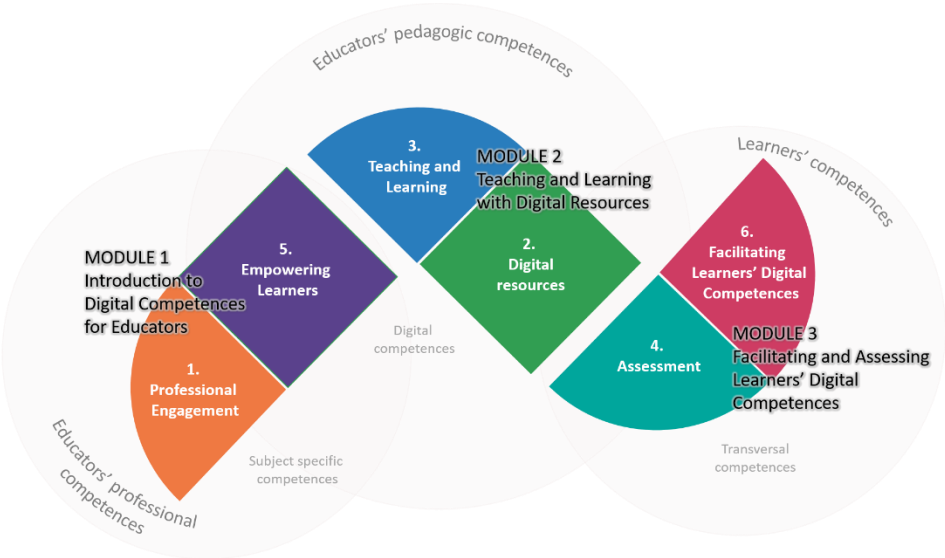

Figure 3. Areas of Digital Competence Framework for Educators in DCE short learning programme modules.

DCE was targeted for educators at various levels and several education areas. Participants may work, for example, as a schoolteacher, a school administrator, a teacher or trainer in vocational education, an

educational developer, an e-learning author, a lecturer or a researcher in higher education, an adult educator, an educational scientist or a trainer in the business sector.

Participants may start as a newcomer with Module 1, which concentrates on professional engagement, digital professional development and empowering as well as actively engaging learners. Exploring the potential of digital technologies in Module 2, which explores teaching and learning with digital resources including selecting, creating, modifying, managing, protecting and sharing digital resources. They may integrate new ideas into their own practices and also become an expert on facilitating and assessing learners' digital competences in Module 3. After studying all three modules, the participant receives a Digitally Competent Educator certificate.

1.2 The Digitally Competent Educators SLP

The Digitally Competent Educators SLP pilot included three modules, which participants could study either individually or by participating in all three modules. Participants could also start from Module 2 or Module 3 if they had sufficient background knowledge to skip the preceding modules. According to the project orientation, and as it has been described previously (Bastos et al., 2021), each module was designed in a scalable way to allow an unlimited number of participants. This decision had implications at several levels. For example, independent study was expected from participants and the tutoring work would focus only on generic guidelines, without intervention in the discussion of the contents. This also meant that the teacher's role was concentrated on the process of the conception and the development of the modules.

Module 1 was called "Introduction to digital competences for educators". It focused on using digital technologies for communication, collaboration and professional development, with the aim to enhance inclusion, personalisation and learners' active engagement. The module belongs to the proficiency level from Newcomer to Explorer and lasted eight weeks, containing seven topics or learning building blocks (LBB). Participants were encouraged to have synchronous and asynchronous discussions and to share their experience within certain topics. All activities had an active as well as a reactive part, for example, after consulting the materials regarding one topic, participants either had to discuss the feasibility within their professional environment (synchronous in small groups as well as asynchronous in a larger group) or create certain examples due to the framework or test certain tools in regard to their range of functions. In a second step, they were asked to react to the responses of their peers. Materials were available online, and each topic included video clips for explanation and deeper illustration. The final assignment consisted of a plan for a digital learning or work project. It was expected to include previously taught course contents, match students' professional background, and would preferably be usable in the future. In addition, each student was asked to peer review the final assignments of three other students.

Module 2 was called "Teaching and learning with digital resources". It focused on managing and orchestrating the use of digital technologies in teaching and learning, including sourcing, creating and sharing digital resources. Module 2 belonged to the proficiency level from Explorer to Integrator. Participants gained some insights about how to identify resources that best fit their learning objectives, learner group, teaching style and materials, as well as other digital resources to support teaching at the end of the module. They were encouraged to discuss the weekly topics with other students in the discussion forums in the learning platform. They were also asked to share their own ideas and the tools they discovered with others through forums. In the module there were eight weeks and seven topics to be covered, from the selection of digital resources to self-regulated learning. Participants were encouraged to have a conversation under the tasks by commenting on their peers' work. Some online tools were presented through videos and participants were also asked to

create some lesson materials. The final assignment was a detailed report on creating a digitally enhanced lesson plan.

According to DigCompEdu framework, the proficiency level for Module 3, "Facilitating and assessing learners' digital competencies" was from Integrator to Expert. The third module focused on using digital technologies and strategies to enhance assessment by enabling learners to creatively and responsibly use digital technologies for information, communication, content creation, wellbeing and problem solving. It had five topics or LBBs over the course of eight weeks. Each topic had a duration of one week, except the fourth one ("Feedback and planning"), which lasted two weeks in order to provide more time for group work. The learning materials made available were in different formats: articles, videos, tutorials and other online resources. Participants had tasks they did by themselves and added the materials to their personal portfolio. After the portfolio, they discussed their opinions and findings in the forums with other participants. Small group tasks were also given to be completed during the course. Participants were asked to form a small group and to do the weekly task with them by using a choice of their own tool for this purpose. For example, chat and wiki were offered for this task. The third module was based on a continuous assessment: each topic included both an automatically assessed activity and an activity that was posted in students' e-portfolio that was peer reviewed.

2. Methods

A student feedback questionnaire, used at the end of each DCE module, was originally created in collaboration with another short learning programme pilot within the E-SLP project. This situation would allow, at a later stage, further research and comparison between the two pilots.

2.1. Data Collection Tool

After each pilot module was completed, feedback was collected from participants using an anonymous feedback questionnaire created in Google Forms. The target of the collection of the feedback was to develop and improve the quality of the next versions of the modules. The questionnaire was carried out as an online survey consisting of 14 Likert items on a five-point scale (see Table 3) with the instructions: *Indicate your opinion regarding the structure, contents and activities proposed in the Module. Please let us know what your opinion is concerning the issues below. Scale: 1 = not at all, 2 = slightly, 3 = moderately, 4 = very well, 5 = perfectly*. In addition, the questionnaire included four open-ended questions (What would you add to the next course? What would you remove from the course? What was the less positive thing at the course? Other suggestions / comments), three demographic information questions (age, gender, nationality) and one yes-no question for permission to use the participant's data.

2.2. Data Collection Process

The feedback questionnaire was embedded in the learning management system (LMS) Moodle. The questionnaire was made available to participants at the end of the modules. Module 1 ran from 20 January to 15 March 2020, Module 2 from 14 April to 5 June 2020, and Module 3 from 5 October to 5 December 2020.

2.3. Participants

Forty-two participants started Module 1, while 19 completed it and 29 answered the survey. Forty-seven participants started Module 2, while 21 completed it and 22 answered the survey. Twenty-three participants started Module 3, while 18 completed it and 17 answered the survey. The demographic information of the module participants who participated in the survey is shown in Table 1 (gender and age) and Table 2 (nationality).

Table 1. Gender and age group of participants in Modules 1–3

	Module 1	Module 2	Module 3
Gender Female	21 (73%)	17 (77%)	15 (88%)
Gender Male	5 (17%)	5 (23%)	2 (12%)
Missing data of Gender	3 (10%)		
TOTAL	29 (100%)	22 (100%)	17 (100%)
Age group			
18–24 years	1	1	0
25–30 years	3	1	1
31–35 years	9	10	1
36–40 years	5	3	2
41–50 years	6	4	7
51+ years	5	3	6
TOTAL	29	22	17

Table 2. Nationality of participants in Modules 1–3

	Module 1	Module 2	Module 3
Finland	3	8	3
Germany	12	6	4
Portugal	5	5	7
Turkey	0	2	1
Other	8	1	2
Missing data	1		
TOTAL	29	22	17

3. Results

Table 3 presents the means of the Likert scale items of all three modules.

Table 3. Student Feedback Survey items (Likert scale 1–5*), means of the answers of participants in Modules 1–3.

	Module 1 N = 29	Module 2 N = 22	Module 3 N = 17
Navigation through the module was easy	3.96	4.63	4.29
The structure of the module was coherent	4.11	4.63	4.53
The contents of the module were relevant	4.25	4.67	4.59
The contents of the module met my personal interest	4.00	4.29	4.29
The contents of the module met my professional interest	4.25	4.21	4.31
The objectives/competences were clear	4.00	4.54	4.41
Activities were appropriate to the contents	4.07	4.46	4.35
The duration of the module was adequate	3.89	--	4.35
Group work was easy to manage	2.86	--	3.53
Discussion forums were easy to use	4.21	4.17	4.35
The estimated time for the tasks was adequate	3.54	4.58	4.18
Assessment activities were adequate and understandable	3.93	--	3.88
I am satisfied with my contribution in the course	3.79	4.38	4.06
The learning management system (Moodle) worked well	4.21	4.79	4.53

*) Instructions for participants: "Indicate your opinion regarding the structure, contents and activities proposed in the Module". Please let us know what your opinion is concerning the issues below. Scale: 1 = not at all, 2 = slightly, 3 = moderately, 4 = very well, 5 = perfectly.

As shown in Table 3, the vast majority of the Likert items received scores of 4 or above for all three modules. This indicates that the students in all three modules were satisfied.

3.1. Answers to the open-ended Questions

The following open-ended questions were used:

- What would you add to the next course?
- What would you remove from the course?
- What was the least positive thing about the course?
- Other suggestions / comments.

The most relevant feedback collected by open-ended questions at the end of each module is reported.

Module 1

The majority of participants shared the opinion that the social presence of teachers and interaction with peers and teachers could have been more extensive. Participants would like to have more team-building activities at the beginning, get to know where peers come from and especially meet their peers as well as teachers in synchronous meetings. Many of the participants were newcomers, so they stated a demand for good practice examples as well as practical implementation. Participants asked for more videos on tools and software as well as examples of how to implement the framework in practice and observe real-life solutions. The third theme emerged as transparency regarding course requirements along with diversity in the completion of assignments. Some participants also stated they would like to have more diversity in ways to complete the tasks and assignments in order to accommodate different learning styles.

A large number of participants consistently stated they would not remove anything, as all topics were useful. However, many of them criticised the way participants were grouped at the beginning of the course. Groups were either too small, the constellation was not right or group members remained inactive. Three participants mentioned the e-portfolio as difficult to work in due to technical issues, and they also wished for institutional integration and embedding it as a fixed task so it is possible to view all e-portfolios.

The third question asked about the less positive things concerning the course. Almost all respondents mentioned a lack of peer interaction within their groups, inactive group members and struggling to organise group meetings. In addition, a number of participants pointed out the workload caused by weekly deadlines. For adults who study while they work, weekly deadlines are difficult if the workload is high.

Most participants were grateful to take part in this module. They appreciated the content as valuable, were "happy to be part of DigCompEdu education" and indicated the module as a big step towards digital competence. Some students wished for more synchronous meetings and more clarity for course requirements.

Module 2

Some participants wanted more collaborative activities in the course, while others wished for more teacher-led activities. A request for more videos about different Web 2.0 tools for education was also mentioned. There were also some suggestions about the timing of the announcement of the final assignments. In general, participants stated they were satisfied with the course, and that they would not change a thing in it.

As in Module 1, most of the participants were satisfied with the module content and they stated there was no need to remove any content. However, a few participants emphasised the need for the removal of long articles.

Most of the participants liked and were satisfied with the presentation on Web 2.0 tools for education and infographics created by the teachers. The academic support throughout the course, practical design activities and well-organised course structure were also mentioned.

Some participants wanted an extension or a longer time for the final assignment. Some asked for a clearer grading criteria for the final assignment. Some participants also emphasised that the content of the module was interesting, while some also expressed a wish that similar courses would be increasingly offered.

Module 3

Module 3 was viewed as very important in personal (4.29) and professional (4.31) terms. This is an important result, considering the target group.

The open-ended answers indicated that the less positive aspect of Module 3 was group work. Participants had to do group work at the same time for two activities over a two-week period. Nevertheless, comments show differences among participants concerning perceptions about group work: for example, three participants suggested eliminating group work, while some others suggested adding more of it. Perhaps this is due to different experiences within their own groups. Some students wished for more forum discussions.

The conceptualisation and development of the module was based on an expectation that the module will have a large number of students in the future. Consequently, the pedagogical model for Module 3 was a compromise between independent learning and cooperation among participants, following guidelines from Universidade Aberta's own Virtual Pedagogical Model (Pereira, Quintas-Mendes, & Amante, 2007; Quintas-Mendes et al., 2019). Most activities were individual activities, but the assignment results were shared in the forums and individual e-portfolios. Even though the Module Learning Guide included the information that there is no active tutoring and no teacher feedback for individual activities, this was not clear to all participants.

4. Conclusions

Our starting point was to design an SLP that corresponds to the parameters of the E-SLP project and that is adaptable to curriculums of the four universities that represent different countries and national educational systems. The detailed design, control over content integration and the planning of learning activities and future sustainability of the SLP modules required the seamless coordination. While developing this new innovative SLP, information technology was utilised widely.

The aim of collecting student feedback from three pilot modules of the Digital Competent Educators SLP was to develop the programme further and to add it to courses targeted for adult learners. According to the data reported in this article, the experiences of students, of whom the vast majority had completed the modules, were mostly positive and encouraging. This was especially the case in the answers to the Likert scale items. The answers to the four open questions provided more specific feedback while allowing students to raise issues not covered by the structured survey questions. These comments showed that there were different expectations on how certain course activities, such as group work, should be organised. The group work caused some issues due to time differences and other scheduling problems. Some of the participants, in turn, were hoping for more collaborative work in the courses. Overall, the participants viewed the content of the modules and the need to learn about these issues as important for their career development. This suggests that the DicCompEdu framework and the way its content areas were applied in the three modules of DCE served the existing educational needs of educators and the diversity of the participants in various levels of education.

Since the feedback obtained from the pilot modules was to be used for further development of the SLP, it was relevant to explore whether the participants who responded to our survey resembled the target group of the SLP. The demographic characteristics of participants presented in Table 1 support the conclusion that they were more similar to adult learners than traditional young degree students.

Overall, it was a challenging and exciting task to create and test an SLP as a new and innovative educational concept. This was done by international partners working mainly online. The collection of student feedback from pilot courses was therefore essential.

In the development phase of all three modules, we collected student feedback from all modules separately. In the future it will be necessary to collect student feedback on the entire SLP, in other words from those participants who completed all three modules. This will most likely require the creation of a separate set of questions. In addition, the feedback and experiences of the teachers who taught the separate modules would be important to use for the further development of the SLP.

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Experiences gained from an e-learning Short Learning Programme on the Introduction of Waste Management developed for graduates of all disciplines

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Abstract
Based on experiences learnt from a Graduate program running for more than a decade in Hellenic Open University entitled Waste Management, the idea of developing a Short Learning Program (SLP) was formulated. Each year, there were several non-natural science or engineering majors that wanted to attend the distance education, Waste Management, 2-year program but did not have the qualifications to be accepted in this Masters Program. Thus, developing an SLP on Waste Management for non-majors seemed like a good idea. The SLP was formulated as an introductory course that kept the structure of the original program but contained information that was not as technical as the original. The SLP runs for 16 weeks, with five 3-week modules, 20 hours of blended teaching (synchronous meetings), 130 hours of self-studying, written projects, and final exams. The SLP is evaluated by learners at the end of their studies through questionnaires. It seems that most of the learners originated from natural sciences and engineering degrees. Their aim was not to attend a Master Program to gain a degree but through the SLP to gain basic knowledge on this topic. They had genuine interest on the topic without expecting an improvement in their career through the attendance of this SLP.

Keywords: introduction to waste management, program evaluation, questionnaire, program development, career development, basic knowledge.

1. Introduction

The Short Learning Program (SLP) entitled Introduction to Waste Management (IWM) started in 2018 at Hellenic Open University (HOU). The idea was to start this program to provide introductory knowledge to learners with first degrees in disciplines other than engineering or natural sciences. Based on experience learnt from a Graduate program that was running more than a decade entitled Waste Management, there were several learners that wanted to enroll in this master's program that did not have an engineering or natural sciences background. However, learners with no engineering nor natural sciences background could not be accepted in Waste Management master's program. Developing an SLP for non-majors providing only introduction to the topic and not going into technical details seemed like a good idea.

The SLP IWM was formulated as an introductory course that kept the structure of the original program but contained information that was not as technical as the original. The learning material is provided online in electronic format and originate from the master's program educational material enriched with the power point presentations created by the instructors and presented during the synchronous meetings. The SLP runs for 16

weeks, with five 3-week modules, 20 hours of blended teaching (synchronous meetings), 130 hours of self-studying, 5 written projects, and written final exams. It has a study load of 10 ECTS and is offered at 5 EQF level. The SLP is evaluated by the learners at the end of their studies through questionnaires. The initial design of the SLP was that the first 5-hour synchronous meeting with the instructors and the final exams would be in person. However, due to the pandemic of COVID-19, all meetings and exams are now performed on-line.

The SLP IWM includes the following five 3-week modules: (a) Natural Environment, (b) Pollution and Public Health, (c) Management of Solid Waste, (d) Management of Liquid Waste, and (e) Management of Gaseous Waste. Since it was designed for non-majors, no mathematic formulas or chemical reactions or formulas are included. A glossary is included to provide definitions for geological, chemical, and biological terms. The instructors of the SLP are university professors accredited for teaching in open and distant higher education.

The structure and the description of this SLP although it started in 2018, followed the principles outlined in Melai et al. (2020). Since HOU was a partner in E-SLP, a project about European Short Learning Programmes (SLPs) for continuous professional development and lifelong learning, HOU School of Science and Technology had access to these principles before they were officially published. The learners receive a Certificate of Graduate level learning.

The aim of this study is to determine the way learners choose an SLP related to an introduction to waste management. The objectives of this study are (a) to determine the learner background for this SLP, (b) to check the overall internal evaluation results, (c) to determine the reason learners choose this SLP, (d) to evaluate the effect of the SLP to the career of the learners, and (e) to determine if attending this SLP is useful.

2. Research methodology

To reach the objectives of the present study, retrospective data aquired over the years of the SLP operation were gathered and evaluated. Also, new data were produced to clarify the existing information.

2.1 Retrospective Data

The program includes an internal evaluation that is performed by HOU administrators at the end of every cycle. This is an anonymous questionnaire having mainly closed-ended questions. Table 1 presents the questionnaire developed by the HOU internal evaluation unit. There were three main criteria used and each criterion had several subcriteria. The possible grades ranged from 0 to 5 with 0 being the “not at all” and 5 being the “very much agree”. Each subcriterion had one open-ended subcriterion that however was not mandatory to fill.

2.2 Prospective Data

In view of the current presentation, a new questionnaire was sent through email to the 76 graduates of the 6 cycles of the program. The questionnaire was anonymous with 3 semi-closed-ended questions and one open-ended question. Table 2 presents the questionnaire developed for this study.

Table 1 Questionnaire of internal evaluation

Criterion	Sub-criteria
1	The objectives of the Curriculum were clear. The duration of the Curriculum was sufficient in terms of achieving the goals that were set. The study schedule was satisfactory. The thematic subjects foreseen in the Curriculum were covered. The use of an e-learning platform to conduct the Curriculum was effective. The Curriculum met my expectations. Comments - remarks - suggestions for improvement (open-ended).
2	The instructors were friendly. The instructors were effective in knowledge transfer. The instructors answered my questions immediately. The instructors effectively answered my questions. Comments - remarks - suggestions for improvement (open-ended).
3	The educational material covered the objectives of the Curriculum. The educational material was modern. The educational material was interesting. The educational material was understandable. The educational material was rich in content. The educational material helped me in the self-education actions. Comments - remarks - suggestions for improvement (open-ended).
4	The administrative support of the Curriculum was satisfactory. Solving a technical problem was done immediately. The way of technical support (email, phone) was effective. Comments - remarks - suggestions for improvement (open-ended).

Table 2: Questionnaire for acquiring new data

Questions	Possible Answers
What was the initial reason for enrolling in this programme?	It is related to your first degree It is related to your job You wanted to gain basic knowledge on waste management You needed a certificate on waste management You wanted to learn more on waste management Other (open-ended)
The Short Learning Programme entitled Introduction to Waste Management	Helped you find a job Improved your position at your job Gave you some basic knowledge that you need for your job Gave you some basic knowledge that you need for your everyday life Other (open-ended)
If you could return to the past, would you choose to attend it again?	Yes No Other (open-ended)
Please add any comments that you think will help to improve the programme.	Open-ended

3. Results

3.1 Profile of learners

Figure 1 shows the first degree of the learners that have applied for the SLP. Most of them have engineering, science, or agronomy background. There is a significant percentage that comes from humanities and a few come from health sciences and security (such as policy or firefighting). People with health sciences backgrounds are concerned with medical waste.

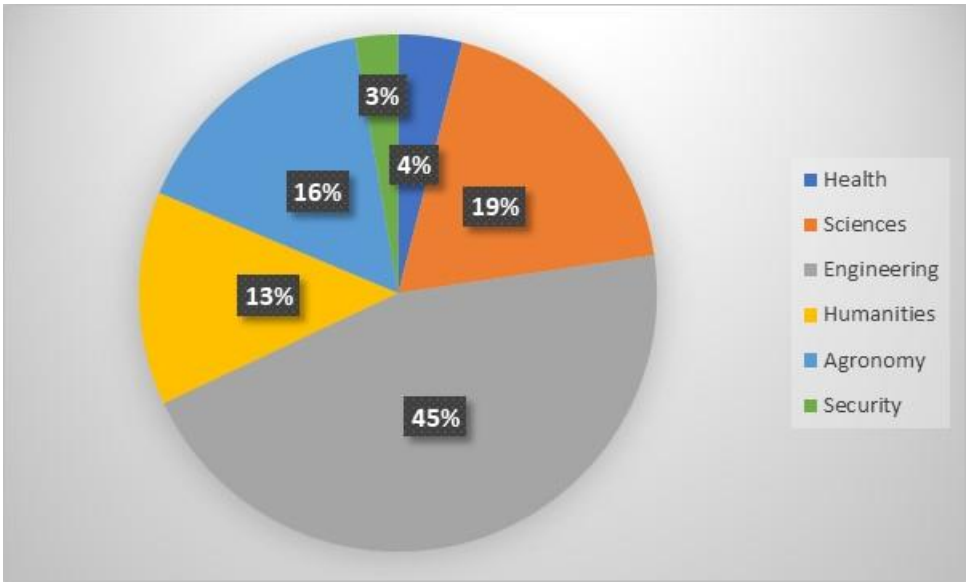

Figure 1 Profile of Learners

3.2 Learners feedback

A summary of the internal evaluation of the 5 first cycles of the SLP is presented in Figure 2. The percentages that replied to this internal evaluation ranged from 40-90% for the different five cycles. For the 6th cycle the percentage that responded was only 6% suggesting that there was some misunderstanding due to administration handling and thus, the data are not used. The scores of the subcriteria are statistically analysed and the average value is presented for each criteria that in summary their numbers represent the following: 1 is for Organization of the Curriculum, 2 is for Instructors, 3 is for the Educational Material, and 4 is for the Administration Support. The obvious message from Figure 2 is that for all criteria, the evaluation scores are generally high and increase with time. Thus, the program is improving with time and the learners are more relevant to the program content. These are possible due to a better diffusion of information related to the program. Taking into consideration the internal evaluation results more accurate information is provided through the website. Also the SLP alumni act as information vectors to other potential learners that maybe better informed.

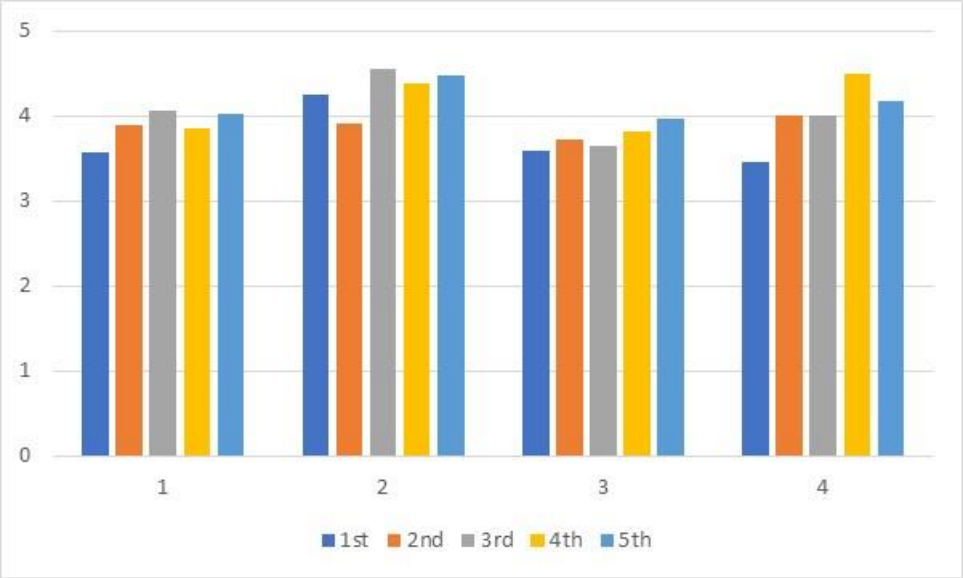

Figure 2 Internal evaluation results over time for each of the different evaluation criteria (1-4 in the x axis) and each of the cycles from 1st to 5th (see the figure legend).

Based on the open-ended comments that were not provided by most of the learners, the main short-coming of the SLP is the educational material as also seen in Figure 2. The learners do not like the electronic version of educational material and would prefer hard copies. The new material provided by the instructors got positive feedback. Also, the learners were happy with their feedback from the homework projects and felt that they learnt through this process. Some technical issues pointed out are mainly due to learners' slow internet connection. A few lernears found the schedule too demanding or too tight having to study and perform homework projects at the same time.

3.3 Prospective evaluation data

57 graduates did answer the questionnaire; this is 75% of the graduates. Figure 3 presents the results of the first question as a pie chart. It seems that most of the learners selected the SLP because it is a topic related to their job or they wanted to gain basic knowledge. Smaller fractions just wanted to get a certificate, or they found it as a continuation of their first degree. Only 17% felt that they were already qualified on the topic and wanted to learn more.

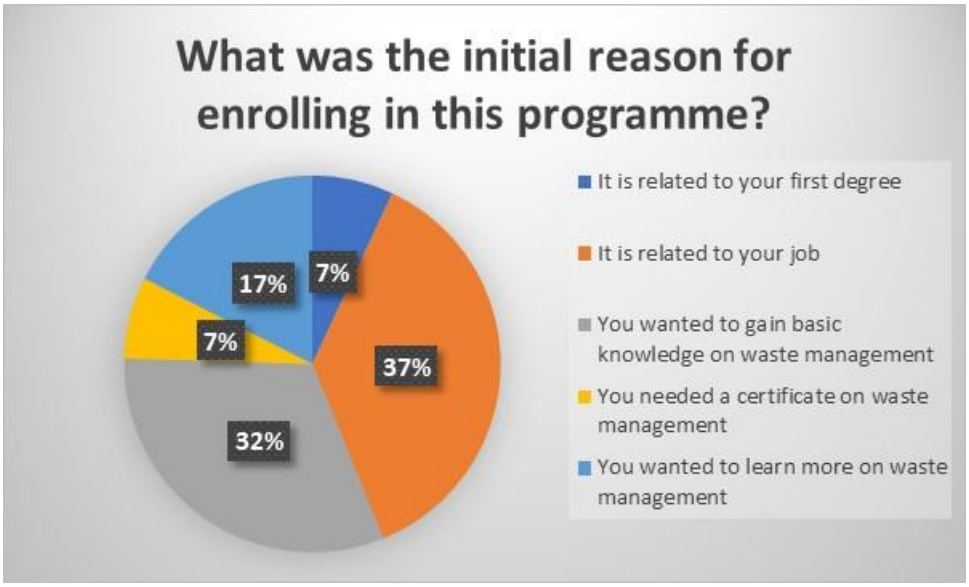

Figure 3 Results related to the first question

Figure 4 presents the results of the second question as a pie chart. It seems that most of the learners felt that the SLF gave them basic knowledge needed for their job. A smaller fraction of learners thought that the knowledge they gained is useful for their everyday life. Only a couple of them felt that the SLP helped them find a job or improved their position in their current job. And another couple felt that it did not help them at all or to find a job. One person mentioned that it helped them because they were working in a job that was not relevant to their first degree but was relevant to waste management.

Figure 4 Results related to the second question

Figure 5 presents the results of the third question as a pie chart. This is a hypothetical question if the learners, now, that they are familiar with the SLP, would endorse their choice of attending this program. The majority of the learners (93%) do not regret choosing this SLP. Only 5% suggested that they would not take this SLP again. One of the participants (2%) mentioned that not only they would take it again but they decided to attend the Master's program entitled Waste Management.

Figure 5 Results related to the third question

50% of the graduated learners that responded to the new questionnaire provided answers to the open-ended question asking ways to improve the program. Surprisingly none of them asked for accreditation of the SLP. One only asked for alumni service that could link the graduates of the program to the job market. Educational material in electronic form was for most learners the main point to be changed and improved (one third of those that provided answers to the open-ended questions). Another one third gave very positive comments whereas the other one third asked for more technical details, extra technical literature, technical tools such as GIS or field work designing and activities such as technical tours in wastewater treatment plants or landfills.

4. Conclusions

The main conclusion of the present study is that SLP programs are needed not only as introductory courses for non-majors. It seems that this need was not met by this SLP. However, this SLP covered the need of people that are relevant to this specific topic to get basic knowledge at graduate level that will be helpful for primarily their job and secondly in their everyday life. It seems that learners need an SLP that will cover introductory information in a global way.

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Learner Focused Multi-campus Micro-credentials: Lessons from Irish Universities (MicroCreds)

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Abstract

Micro-credentials have the potential to make education more inclusive, being accessible to a wide range of learners through their flexible, agile and short duration approach. Micro-credential development may drive lifelong learning and accelerate educational and economic innovation, helping contribute to a sustainable post-pandemic recovery.

Multi-campus Micro-credentials (MicroCreds) is an ambitious five-year project (2020-2025) led by the Irish Universities Association working with seven of our partner universities. The project is funded by the Irish Government and has four interconnected objectives:

1. **Develop a framework for Multi-campus Micro-credentials (MicroCreds) which are quality assured and placed on the Irish National Framework of Qualifications**
2. **Develop a sustainable model of enterprise engagement for micro-credentials**
3. **Design and deliver a Discovery Portal linked to a digital credentialing platform**
4. **Develop and deliver a suite of micro-credentials in all seven traditional Irish universities.**

The core value underpinning our project is learner focused engagement. Learners may choose to undertake a micro-credential as a standalone award or stack credentials to form a larger award. Our approach seeks to facilitate learner journey autonomy. Micro-credentials are shorter units of learning designed in a more flexible and agile way for a wide range of learners with different motivations for study. Learners may upskill or reskill to meet labour market needs, develop new competencies without completing a full higher education degree programme or further develop professionally.

This workshop will examine the challenges and opportunities in embedding learner engagement in micro-credentials. The workshop has four objectives:

1. **To deepen understanding of the learner and learning engagement in lifelong learning**
2. **To learn from the experience of Ireland's Multi-campus Micro-credentials (MicroCreds) project**
3. **To share good practice approaches to learner engagement in micro-credentials**
4. **To critically examine learner expectations for micro-credentials**

The workshop will adopt an inter-active approach and participants will be invited to complete a short questionnaire in advance to explore their views on micro-credential learner engagement.

Keywords: Micro-credentials, higher education, lifelong learning, learner engagement, flexible learning, enterprise engagement, agility.

1. Introduction

Micro-credentials have the potential to reimagine and reframe the relationship between learners, universities, the public sector, civil society partners and enterprise, accelerating a step change in lifelong and life-wide learning. In this workshop we will present the approach to the development of a national framework for micro-credentials by the Irish Universities Association (IUA) and seven Irish universities under the MicroCreds project, situating our work within European and global developments in micro-credentials (IUA, 2021). Learner interest in micro-credentials has increased significantly in the last few years. This is reflected in the Organisation for Economic and Development's (OECD) identification of growing activity related to micro-credential development by governments and providers (OECD, 2021). We will explore learner engagement in the context of micro-credentials, responding to Oliver's invitation to examine the value of micro-credentials for learners (Oliver, 2021). Our workshop will consider who the micro-credential learners are likely to be and examine the implications of learner demographics for meaningful learner engagement. It should be noted at the outset that we will follow the European Commission's draft definition of micro-credentials, outlined below (European Commission, 2020).

2. Micro-credentials, the Story So Far

Micro-credential research may be considered to be a relatively new form of academic provision, which is just beginning to be underpinned by an emerging body of literature, policy and university practice. Selvaratnam and Sankey (2021) identify that the work is at a nascent but evolving stage where common frameworks are yet to be established. Beiren, Nic Giolla Mhichíl and Brown (2020) argue that there is no consensus on the term micro-credential and that the definition varies significantly internationally. The European University Association (EUA) study under the MICROBOL Erasmus+ project identified a micro-credential as a "sub-unit of a credential or credentials" that could accumulate into a larger credential or be part of a portfolio (MicroHE Consortium, 2019). In New Zealand, the Qualifications Authority asserted that a micro-credential certifies achievement of a coherent set of skills and knowledge with a statement of purpose, learning outcomes and evidence of need by industry, employers, or the community (New Zealand Qualifications Authority, 2021). eCampus Ontario has developed a set of principles and framework for micro-credentials which describes micro-credentials as recognising "performance competencies explicitly aligned to underlying knowledge, attitudes and skills" (eCampus Ontario, 2021). Oliver's highly influential definition, published in 2019, defines micro-credentials as "a certification of assessed learning that is additional, alternate, complementary to or a formal component of a formal qualification" (Oliver, 2019).

The European Commission's draft definition on micro-credentials was developed following the work of the Commission's Higher Education Consultation Group on Micro-credentials (2020) whose purpose was the

development of a common definition and the creation of a European-wide approach to micro-credentials. The definition proposed by the European Commission provided clarity and consistency of both approach and language which has proven particularly useful for the Irish context. The draft definition is as follows:

"A micro-credential is a proof of the learning outcomes that a learner has acquired following a short learning experience. These learning outcomes have been assessed against transparent standards. The proof is contained in a certified document that lists the name of the holder, the achieved learning outcomes, the assessment method, the awarding body and, where applicable, the qualifications framework level and the credits gained. Micro-credentials are owned by the learner, can be shared, are portable and may be combined into larger credentials or qualifications. They are underpinned by quality assurance following agreed standards." (European Commission, 2020).

The European Commission undertook a 3 month public consultation on micro-credentials in 2021 entitled 'Micro-credentials – broadening learning opportunities for lifelong learning and employability'. Responses (n=508) to this consultation will inform the Commission's proposal for a Council Recommendation on micro-credentials for lifelong learnng and employability.

While variation in emphasis exists in definitions, there are emerging consistencies, with the majority of definitions stating that a micro-credential is a "small volume of learning certified by a credential" (Cirland and Loukkola, 2020). The OECD considers that higher eduaction institutions are "offering a diverse range of short learning programmes that would meet the criteria of micro-credential programmes as commonly defined" (2021, p1). It is also important to acknowledge that there is a well-established tradition and practice of the provision of upskilling, reskilling, professional knowledge and capabilities for lifelong learning by universities and that the developing work in micro-credentials builds upon the existing expertise.

2.1 MicroCreds approach to Micro-credentials development.

MicroCreds is an ambitious 5-year (2020-2025), €12.3 million project led by the IUA in partnership with seven IUA universities: Dublin City University, Trinity College Dublin, Maynooth University, National University of Ireland Galway, University College Cork, University College Dublin and University of Limerick. The project funding was awarded following a competitive process under the Department of Further and Higher Education, Research, Innovation and Science's (DFHERIS) Human Capital Initiative Pillar 3 Innovation and Agility, with funding drawn from the National Training Fund (IUA, 2020).

IUA project partner universities are collaborating to develop, pilot and evaluate the building blocks required for a transformation in lifelong and life-wide learning through micro-credentials. Micro-credentials developed at partner universities will set the national standard for excellence in flexible and agile learning. We are working in partnership with learners and our Enterprise Advisory Group, comprising senior enterprise members from business representative organisations, enterprise agencies, private sector companies and state bodies with responsibility for skills to change thinking about and engagement structures with university learning. We are focusing on learners who are seeking to upskill or reskill, return to employment or change careers.

MicroCreds has adopted a four-element universal vision to frame the initial pilot phase of our programme. It will be reviewed and refined following a structured evaluation, commencing late 2021.

The first element is the working definition of micro-credentials, mirroring the European Commission definition. Within our interpretation of this definition, learners may choose to undertake a micro-credential as a standalone award or stack their learning towards a larger award. We will be the first European country to establish a coherent national framework for quality assured and accredited micro-credentials. The micro-credentials will be awarded by the universities, and will be included within the Irish National Framework of Qualifications as small volume non-major awards, under mechanisms agreed by the universities and the national quality assurance and qualifications agency, Quality and Qualifications Ireland (QQI). This will support transparency, understanding and portability.

The second element of the universal vision is the seven core values which underpin MicroCreds. These are summarised in Table 1 below:

Table One: MicroCreds Seven Core Values

Value	Elements
Leadership in Lifelong Learning	• MicroCreds universities are leading new ways of thinking in lifelong and life-wide learning • Cultural change in how and when learners engage with university learning • Cultural change in how universities, enterprise and civil society partners collaborate
Tackling Economic and Societal Challenges	• Micro-credentials developed in close collaboration with Enterprise, Public Sector and Civil Society partners • Designed to address economic needs and respond to societal and developmental challenges • Dynamic suite of accredited short credentials/credit-bearing learning opportunities
Dynamic Enterprise Collaboration	• Meaningful and sustainable model of enterprise partnership • Enterprise-informed micro-credentials • Supporting the work force of the future with design approach which fits around work and life commitments • Identifying emergent job and skills needs, informing and evolving the suite of micro-credentials available
Excellence and Innovation	• Innovative teaching, learning and assessment approaches, enhancing learner success • Quality assured by IUA universities • Research led and discovery focused micro-credentials
Flexible and Agile	• Unlocking established programmes to foster learning through discrete, short credentials • Developing a suite of new, cutting edge micro-credentials in emerging fields and high demands skills • Delivered online, in person or blended depending on the discipline content and stakeholder needs • Learning in a range of locations: on campus, off-site, in the

	workplace
Learner Focused	• Learners may choose to undertake a micro-credential as a standalone award or stack credentials to form a larger award • Facilitates learner journey autonomy; learners may stack learning at their own pace • Wide range of learners: pre-entry, undergraduate, postgraduate • Different motivations for study: upskilling, reskilling and career change and evolution, responding to legislative, regulatory, economic and professional demands • Agency for learner to embrace innovation and technological change and pursue personal interests
Inclusive	• Designed to support alternative pathways to, progress through, and journeys in higher education • Encouraging widest possible participation in micro-credentials by eliminating all unnecessary barriers to access • Underpinned by different approaches to communication, engagement and learner support • Opens up professional learning journeys and lifelong learning

The third and fourth elements of the universal vision are the constitutive elements and a common supplement for MicroCreds micro-credentials. The MicroCreds universities are developing micro-credentials working under the pilot constitutive elements which contain the following key components:

a. Aligned with the Irish National Framework of Qualifications (NFQ) at levels 7, 8, 9 or 10 (European Qualifications Framework [EQF] levels 6-8)
b. Credit size within a range of 1-30 European Credit Transfer and Accumulation System (ECTS)
c. Quality assurance by the universities' quality assurance systems, with accreditation from professional bodies if relevant
d. Stand-alone award (some micro-credentials may be stacked towards larger awards)
e. Assessed against objective, transparent, stated learning outcomes.

A common supplement for MicroCreds micro-credentials will be developed during the pilot phase to ensure that the required meta-data for micro-credentials is easily accessible to all stakeholders.

3. Learner Engagement

Student/learner engagement is a well-established corner stone of high-quality teaching and learning in higher education. Twenty years ago, the European Ministers responsible for Higher Education welcomed the role of students as "competent, active and constructive partners in the establishment and shaping of a European Higher Education Area". Examples may be seen in many higher education systems, including the Irish higher education system.

The Higher Education Authority (HEA) established a working group in 2014 to examine and make proposals on student engagement in higher education institutions (HEA, 2016). The National Student Engagement Programme (NStEP) was established subsequently by three partner organisations (QQI, HEA and Union of Students Ireland) to enhance student engagement in decision-making across Irish Higher Education. NStEP has

subsequently adopted a Framework supporting authentic student engagement in decision-making which identifies five principles of student engagement: dialogue, building trust, equity and inclusivity, empowerment, and students as co-creators. (NStEP, 2021). MicroCreds is working with NStEP to evaluate how these principles can inform and support student engagement in the strategic project development and in the development of micro-credential programmes.

The importance of foregrounding a learner focused approach to MicroCreds has become particularly apparent during the current pandemic period, where the role of robust student engagement has been amplified and gained renewed importance (Natzler, 2021). Hassan *et al*., identify that COVID-19 "had a significant (and perhaps, unexpected) influence on dialogue on the role of student partnership in decision-making and particularly on teaching learning and assessment" (2021, p1).

3.1 Learner Engagement in micro-credentials

3.1.1 Who are micro-credentials learners?

Oliver (2021) argues that micro-credentials need a way to ensure that "they are valued, and bring value to key stakeholders: particularly learners, employers and providers". She proposes a micro-credential value framework that set out their key benefits and costs for learners. The value framework lays out eight headline benefits: outcomes, certification, signalling power, interoperability with other credentials, quality and standards (including industry endorsement or accreditation, if relevant), assessment and feedback, engagement and convenience. The benefits are offset against two costs: financial and temporal. Oliver's proposed value framework is intented to be a conversation starter to enhance learner success through micro-credentials.

The MicroCreds values outlined in Table 1 described the elements which foreground the MicroCreds approach to learner engagement as being reflective of the autonomy of the learner and the learner journey. This learner focused development understands that there may be a wide range of motivations which may influence a micro-credentials learner. A recent study funded by Skillnet Ireland asked employees what their objectives for undertaking a micro-credential would be (Nic Giolla Mhichíl, Brown, Beirne *et al.*, 2020). The most popular responses were: improving skills on subjects relevant to employment (84%), keeping up to date with what is happening in their sector (71%) and learning new skills to be able to change jobs/sector (45%). Similarly, in a study of 2,000 working age "prospective students" commissioned by the Higher Education Council of Ontario, 69% said they would be interested in micro-credentials for professional development, with 78% of respondents saying that upksilling and continual education would be important for "future proofing" their careers (Pichette, Brunwell, Rizk *et al.*, 2021). A recent HEA survey found that almost half of the population in Ireland would like to retrain to work in a more progressive and evolving sector. More than one third of people feel that the COVID-19 pandemic has made them consider upskilling or reskilling. However, cost, time and confidence are barriers for people considering a change. (HEA, 2021).

A fundamental consideration here is who are micro-credential learners? What does the emerging research suggest? Recent work by the OECD draws from research on the general profile of learners participating in non-formal education (OECD, 2021). Five trends are identified: learners are likely to be of working age, already have a higher education qualification, are drawn from more privileged socio-demographic groups, have a higher level of digital competence and likely have some knowlege related to the course topic.

The MicroCreds Steering Committee, Enterprise Advisory Group and university Project Leads were surveyed during the initial stages of MicroCreds (2021). These project stakeholders were surveyed on their attitudes, preconceptions and assumptions on learner enagagement with micro-credentials. Stakeholders were asked who they considered to be the 'target' learner for a micro-credential developed within the context of MicroCreds. Employees, based in Ireland, seeking to upskill or reskill within their current role or employees looking to change roles were identified as the core target groups for micro-credentials developed through MicroCreds. These core target groups were simultaneously identified as the priority learner profiles most likely to undertake a micro-credential. Motivations for undertaking a micro-credential were determined amongst the MicroCred stakeholder groups and again reflected the desire to improve professional/employment-related skills being viewed as the overarching catalyst for learners to engage with micro-credentials (Figure 1).

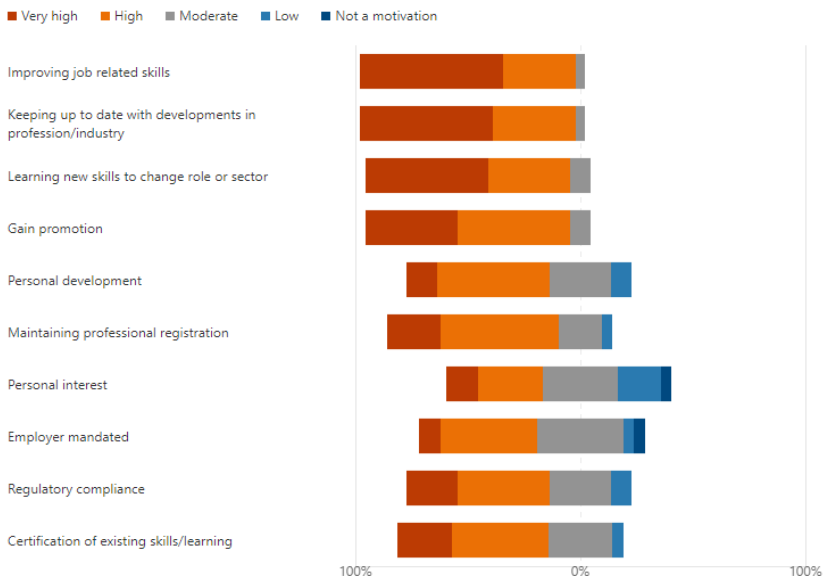

Figure 1. Image showing responses to the question "What do you think the motivation for learners undertaking a micro-credentials would be?" The MicroCreds Steering Committee, Project Leads and Enterprise Advisory Group were surveyed during June 2021 using SurveyMonkey software (Momentive Inc., CA, USA). Responses were anonymous (n=23).

Our approach has similarities with the emerging research outlined in the OECD data (OECD, 2021) and it is our intention to gather more in-depth and reflective of practice data from our MicroCreds stakeholder groups at defined review points throughout the project, allowing for more longitudinal data capture and analysis.

3.1.2 Considerations for learner engagement

Needs analysis research was commissioned by the IUA to inform the MicroCreds project proposal, using a leading international management consultancy firm. This research examined, in an Irish context, the status of learning and development within businesses, identifying key needs, current management practices of learning and development and examining the relationships with enterprise and universities. This provided an evidence-base to strenghten the ambition of the MicroCreds project in targeting enterprise and meeting learners' needs in a meaningful way.

Our working assumptions for the inital pilot phase for MicroCreds learners are derived from a review of current academic literature, stakeholder consultations, analysis of current university practice and data collection on learners undertaking non-major awards.

They are as follows:

1. Many learners are career developers and are seeking to upskill/reskill or change career. Markow *et al*. (2017) curated terms for the micro-credentials which these learners may undertake as being "Door Openers" for new labour market entrants and "Career Escalators" for those already in employment and seeking to upskill or reskill in order to achieve their career ambitions.
2. Many learners are likely to be in employment and/or have family and other responsibilities
3. Many learners are likely to have already obtained a university qualification
4. In many cases, enterprise/the employer will require or encourage learners to undertake the micro-credential.

The workshop will invite participants to consider these assumptions and reflect on how they compare with working assumptions they may have from their own perspectives as policy makers, academics and organisational leaders.

3.2 MicroCreds approaches to learner engagement

The inital pilot phase of the MicroCreds project has explored a number of approaches to embed a learner focused approach throughout. In the workshop, we will share three short case studies illustrative of our work to date:

1. Project proposal commissioned study (understanding enterprise views)
2. Project branding (understanding motivations of micro-credentials learners)
3. MicroCreds Discovery Portal (foregrounding the learner journey)

4. Conclusions

Intensive work on micro-credentials work is considered to be at relatively new stage, but synergies and commonalities are emerging. Learner engagement is fundamentally important. What we have learned? There is a need to think critically about learner engagement from the outset and to rethink our "usual" approach to learner engagement in higher education. No one size fits all.

In order to attempt to answer Oliver's question it is important to attempt to understand who micro-credential learners are or are considered likely to be. Existing data and research on more informal learning may provide us with insight, however, it is critical that assumptions are not made when one takes into consideration that micro-credentials are not yet fully developed concepts in the consciousness of either the 'target' or other learners.

Challenges exist, and will continue to exist and evolve as the classification and taxonomy around micro-credentials are advanced. However, with major nationally-funded projects such as MicroCreds, we can begin to understand through strategic actions and continued dialogue and consultation with key stakeholders (learners, academics, enterprise, quality assurance bodies, *etc*.) the level of development required.

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Using a blended approach to enrich MOOCs on Finnish education

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Abstract
Blended education embraces various combinations of face-to-face and online teaching. It has become a normal part of higher education degree programmes. Since the late 1990s, the Open University of the University of Jyväskylä (JYUOpen) has been offering online and blended education for its rapidly growing number of students. For many years now, Finnish education has ranked high in PISA research. Furthermore, the University of Jyväskylä has been successful in global rankings, especially in the field of education (Shanghai Ranking: 36, QS World University Rankings: 51–100 and Times Higher Education: 67). In order to present the success factors of the Finnish education system, we offered our first MOOC in the autumn semester of 2016 and the blended model of it in the autumn semester of 2017. By utilising our MOOCs and offering face-to-face teaching on campus, we can enhance deeper understanding of different education topics and organise collaboration opportunities for our exchange and degree students. In the autumn semester of 2020, we offered this blended course fully online by utilising synchronous online meetings. In this article, we present student feedback and teacher experiences of our blended model. Based on the preliminary analysis, student feedback on the blended model is constructive and positive. Student feedback has been an essential part of the development of the MOOC courses.
Keywords: MOOC, blended learning, online learning, face-to-face teaching, PISA, Finnish education, collaboration

1. Introduction

This article describes how massive open online courses (MOOC) can be utilised to enrich education. We used a blended learning model, which featured MOOCs and face-to-face teaching, in order to present the success factors of Finnish Education to our international students.

Our blended Education in Finland course included five MOOCs and three face-to-face meetings. The face-to-face learning activities supported the online studies in a deliberate way, and we used them to clarify the online contents and deepen what was learned online. The Education in Finland course started with an online meeting. We used a large amount of time to activate the students to interact with each other. We also introduced all

five MOOCs to students and made sure that everybody had access to our learning management system (LMS) Moodle. We gave students a preliminary timetable, in which we advise students to study one MOOC in three weeks. In face-to-face meetings, we organised group discussions and different kinds of small tasks based on the MOOCs. The purpose was to make sure that the contents were clear and properly understood. We also deepened the content areas with short presentations. The main purposes of the meetings were interaction and knowledge sharing.

In this article we present our research findings on our blended learning course. We explain how we offered a blended Guide to Finnish Education course, how students reacted on it and what were teachers' as well as students' experiences of it.

1.1 From online to blended education and MOOCs

Bates (2016) defines online learning to be "any form of learning conducted partly or wholly over the Internet". While learning, learners must use a computer, tablet or some other device. They must go online – through the Internet – to be able to obtain information or be able to discuss with a teacher or with other students. The fully online learning means that learners study entirely online and do not come to the campus at all (Bates, 2016). Vandana and Thurman (2019, p. 302) propose three alternative definitions for online learning:

- *learning experienced through the internet/online computers in a synchronous classroom where students interact with instructors and other students and are not dependent on their physical location for participating in this online learning experience.*
- *learning experienced through internet in an asynchronous environment where students engage with instructors and fellow students at a time of their convenience and do not need to be co-present online or in a physical space.*
- *education being delivered in an online environment through the use of the internet for teaching and learning. This includes online learning on the part of the students that is not dependent on their physical or virtual co-location. The teaching content is delivered online and the instructors develop teaching modules that enhance learning and interactivity in the synchronous or asynchronous environment.*

Graham (2006, p. 41) defines the term blended learning to be a learning system that "combine [s] face-to-face instruction with computer mediated instruction". In his literature review, Vignare (2007, p. 38) says "Blended learning courses integrate online with face-to-face instruction in a planned, pedagogically valuable manner, and do not just combine but trade-off face-to-face with online activity (or vice versa)". Goeman, Poelmans and Van Rompaey (2018, p. 16) define blended learning to be "learning as a result of a deliberate, integrated combination of online and face-to-face learning activities". In the same research report they also define blended teaching as "the design and facilitation of blended learning activities" (Goeman et al., 2018). Cronje (2014, p. 114) argues that current definitions of blended learning talk mainly about the blend and ignore the word learning. He suggests a new definition for blended learning: "the appropriate use of a mix of theories, methods and technologies to optimise learning in a given context" (Cronje 2014, p. 120).

Cambridge Dictionary (2021) defines the term *MOOC* as a course which is available online and which is planned so that a large amount of people can study it at the same time. The development around MOOCs is ongoing and for that reason it is understandable that researchers continue to discuss a standard definition (Jansen, 2013). Figure 1 illustrates the ongoing discussion. It is not clear what is meant by each letter. For example, the following question should be discussed: how many students does a MOOC need to be massive – 1,000, 50,000, more?

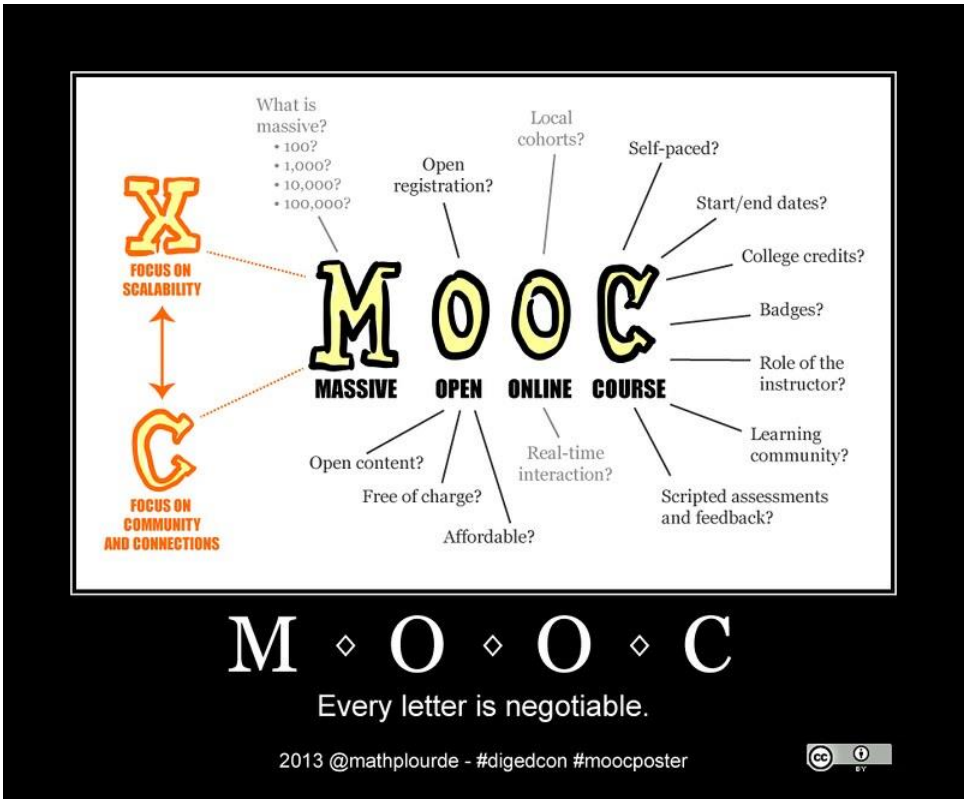

Figure 1: Every letter of the abbreviation of MOOC is negotiable (Plourde, 2013).

Stracke et al. (2019) agree that *MOOC* stands for Massive Open Online Course. But they repeat questions about every letter of the abbreviation. In this article we rely on the following MOOC definition: "MOOCs are courses designed for large numbers of participants, that can be accessed by anyone anywhere as long as they have an internet connection, are open to everyone without entry qualifications, and offer a full/complete course experience online for free" (OpenupEd, 2015).

1.2 From the first Finnish-Speaking teacher training college to a high-ranking University

Our five MOOCs on Finnish Education were developed at the University of Jyväskylä. The University of Jyväskylä is a multi-disciplinary university which was established in 1863 as the first Finnish-speaking teacher training seminary. The founding of the seminary was the beginning of teacher training in Finland. Nowadays, the University of Jyväskylä consists of five independent institutes, two subsidiaries and six faculties (JYU Faculties, 2021). The six faculties have over 14,000 students yearly from all over Finland and around the world (JYU Key Figures, 2021). When we include all the adult learners at JYU, the student number is about 45,000 students. In a global comparison of universities, our research activity belongs among the top three percent of higher education institutions and ranks as some of the best in several research areas and disciplines (JYU Facts and Figures, 2021). For example, education ranks 36th in the Shanghai Ranking, 51–100 in the QS World University Rankings and 67th in the Times Higher Education ranking (JYU Key Figures, 2021).

Since the autumn of 2015, the Faculty of Education and Psychology (EDUPSY), the Finnish Institute for Educational Research (FIER) and the Open University of the University of Jyväskylä (JYUOpen) have been located in the same building, Ruusupuisto, at the University of Jyväskylä. After moving into the building, the heads of EDUPSY, JYUOpen and FIER decided to meet regularly, once a month. They discussed current issues and developed new ideas together. Based on the university's success in education, they decided to build MOOCs around the theme of "The Success Factors Behind the Finnish Education". The closeness of the three different units enabled cooperation and made the MOOC development process fluent and productive.

JYUOpen has 19,000 students annually, offering around 50 different subjects and producing 130,000 ECTS credits every year. JYUOpen is Finland's largest open university, with 24% of the open university education in Finland (Annual Report of JYU, 2020). Furthermore, JYUOpen is specialised in adult education and its guidance methods are developed especially for distance learning (Pedagogical Guidelines, 2021).

The Faculty of Education and Psychology (EDUFI) is a research and education unit that includes four separate departments: Education, Teacher Education, Psychology and the Teacher Training School. EDUFI is one of the leading European experts in broad-based teacher education and adult education. Its pedagogical approach is based on student-centred methods and multidisciplinary phenomenon-based teaching and learning (Faculty of Education and Psychology, 2021).

The Finnish Institute for Educational Research (FIER) is a multidisciplinary independent institute within the university which has national tasks and international responsibilities. FIER investigates and assesses Finnish educational system as well as researches the entire educational system of Finland, starting from pre-school and extending to higher education. Furthermore, FIER is in charge of the Programme for International Student Assessment (PISA) studies in Finland (Finnish Institute of Educational Research, 2021).

1.3 Two decades of success in the Programme for International Student Assessment

Since 2000, Finland has ranked high in all PISA tests. PISA is the Organisation for Economic Co-operation and Development's (OECD) international standardised assessment which produces information about education, learning outcomes and informal learning. PISA measures how well 15-year-old students can use their skills in reading, mathematics, and science knowledge to solve real-life problems. Participating OECD countries can follow their success and progress in meeting key learning goals in reading, mathematics, and science (OECD PISA, 2021).

The first PISA assessment was organised in 2000. Since then, the PISA assessment has been organised every three years (Minedu PISA, 2021). More than 90 countries and approximately 3,000,000 students have participated in PISA since it started. The OECD encourages low-achieving countries to research the educational policies and practices of the successful countries. Circumstances are, of course, different around the world, but benefits from different educational policies can be found. The educational models of successful countries can benefit low-achieving countries as they develop their educational systems (OECD PISA FAQ, 2021).

In PISA assessments in 2000–2009, Finnish young people ranked at the top of literacy skills (Välijärvi et al., 2002; Sulkunen, 2012). The Finnish students were particularly good at searching for information. They also understood what they had read and could make interpretations of it. The performance differences among Finnish young people were small when compared internationally (Välijärvi et al., 2002). According to Linnakylä and Sulkunen (2003), the international comparative results of literacy skills showed Finnish basic education has been successful in producing a consistently high level of literacy. However, the literacy skills of Finnish students started to show a decline in the 2009 PISA survey and continued to decline in 2012 (Arffman & Nissinen, 2015). According to the PISA (2018), despite the decline in PISA results, the literacy skills of Finnish young people were among the best in the OECD countries. The number of excellent readers has remained good, but the number of weak readers has increased. Similarly, differences between students have increased. However, Finland is the only country where both literacy and life satisfaction were at a high level (PISA, 2018).

From 2000 to 2009, the mathematics performance of Finnish young people was at a high level among OECD countries (Välijärvi et al., 2002; Kupari, 2012). Välijärvi et al. (2002) emphasised that the equality of Finnish education policy was clearly reflected in the results, as the variance in mathematics performance was smaller than in any other participating country. The share of Finnish students among low-achieving students was small, and the share of well-performing students was also higher than the OECD countries on average. The mathematics skill of Finnish students had decreased since 2009. According to Kupari and Nissinen (2015), the

strongest explanations for students' learning outcomes in mathematics were students' attitudinal factors towards mathematics, the immigrant background of the pupils, the cultural and the socioeconomic background, and attitude towards school. According to PISA (2018), the mathematical skills of Finnish young people were still clearly better than in the OECD countries on average.

Finnish young people were among the best in science in the first PISA assessment in 2000. It was typical for Finnish students that the performance differences among them were small (Välijärvi et al., 2002). The competence has been steadily declining since 2006 (PISA, 2018). However, the results of PISA (2018) showed that the competence in science of Finnish students was still at the top of OECD countries, just as they were in mathematics and reading.

1.4 From inequality to the happiest nation in the world

The basic idea of the Finnish education system is to provide all citizens equal opportunities to receive education despite age, domicile, sex, mother tongue and financial resources (Reinikainen, 2007). The development of the Finnish education system has occurred over a long period, and it has gone hand in hand with the development of the welfare state (Risku, 2014).

According to Antikainen et al. (2013), in the 16th century, the state began to take responsibility for organising education. The Basic Education Act was enacted in 1866. In Finland, education was regarded to have an essential role in the creation of social justice. Antikainen et al. (2013) mentions that the attitudes towards education were also negative for long time. Some people in the countryside thought that children should not waste their time by sitting in school when they were needed as labour in the fields. School attendance, therefore, was not regular.

Antikainen et al. (2013; see also Risku, 2014) suggests it was not until 1921 that participation in basic education was made compulsory for school-age children. It meant a common four-year basic school for all Finnish children. The basic schools were for the citizens of the whole nation whereas the grammar schools enabled higher education and access to a higher position in society. After Second World War, Finland experienced one of the strongest structural changes in its history. The country changed from an agrarian society to both an industrial society and a service society at the same time (Antikainen et al., 2013). If a person was a talented enough, lived in a city and applied to higher education, climbing the social ladder became possible, despite one's initial social status.

In the 1960s, Finland began to create a uniform nine-year comprehensive school which consisted of six years of primary school and three of lower secondary school (Antikainen et al., 2013; Risku, 2014). With the implementation of the comprehensive school system in early 1970s, the parallel school system was finally discontinued (Risku, 2014). Teacher training was transferred from teacher colleges to universities, and qualified teachers were required to have a master's degree (Risku, 2014). The equal opportunity for all and highly qualified teachers are the factors behind the success of the Finnish education system and the wellbeing and happiness of its citizens.

1.5 Aim of the study

The aim of the study was to investigate the students' feedback and experiences as well as teachers' experiences of our blended learning model.

The research questions were the following:

1. What kind of feedback did the students give after completing the blended learning course?
2. What did the students learn when participating in the blended learning course?
3. What kind of experience did the teachers have when teaching the blended learning course?

2. Study assignment: Guide to Finnish Education MOOC

In this article, we analysed five MOOCs (Figure 2), each covering one area of Finnish education from pre-primary to upper secondary education. MOOCs are open to anyone interested in education, teaching and educational support services, and they do not require prior studies.

Figure 2. MOOCs on Education in Finland

2.1 The five MOOC courses

The MOOC "Early Childhood Education in Finland: What, Where and How?" introduced students to early childhood education and care (ECEC) in Finland. The students learned about the Finnish ECEC system and its main principles and values as well as the various levels of its curriculum. They also learned about the meaning of play in the Finnish ECEC system, the principles of child-centred pedagogy, and the meaning of educational partnership, teamwork and learning environment. During this MOOC, students discovered what kinds of learning environments and with what kinds of pedagogical practices children are actively learning throughout their day at day-care centres.

The MOOC "The Success Story behind Finnish Basic Education" presented knowledge about the operating principles and structures of Finnish schools. In this MOOC, students and teachers of primary and lower secondary education talk about their experiences of Finnish basic education. The MOOC deals with the students' pedagogical skills and what the 21st century skills in teacher training are. The characteristics of Finnish teacherhood and the fundamental role of teacher education in the Finnish success story are important parts of this MOOC.

The MOOC "Educational Support and Guidance Services in Finland" concentrated on the nature of support, guidance and counselling services in Finland. The course handled the themes of special education, inclusive education, and guidance practices in Finland. The students reflected on and compared the Finnish support system with the services of other educational systems and countries.

The MOOC "Upper Secondary Education" concentrated on explaining the significant turning point in young adults' lives. This is the first time when adolescents have the opportunity to choose where they would like to continue their studies. Earlier, compulsory school age ended at age 16. However, recent changes in Finnish legislation extended the compulsory school age to 18 years. This means that it is compulsory to enrol in upper secondary education. Students can choose between general upper secondary school or vocational education and training (VET). This MOOC presents these opportunities as equal because in Finland VET professionals are valued and well-paid members of Finnish society.

The MOOC "Educational Leadership" had two main goals: first, the students were expected to create an understanding about educational leadership in Finland, and second, through this understanding, understand the significance of educational leadership in general. Moreover, this MOOC presented the history of Finnish education system: how our education system was created and what affected its development.

The University of Jyväskylä has many international and exchange students. The Faculty of Education and Psychology wanted to utilise MOOCs for these students and for this reason the Open University and the Faculty of Education and Psychology developed a blended learning course called Guide to Finnish Education. This blended learning course included all of the above-mentioned MOOCs and three face-to-face meetings. Our blended learning model included extensive peer-to-peer interaction and some student–teacher interaction. In face-to-face meetings, we wanted to give students the opportunity to discuss and share their thoughts on different MOOC contents.

2.2 Methods and data

The MOOCs were held in the autumn terms of 2019 and 2020. In 2019, 24 students enrolled in a course called Education in Finland and in 2020, there were 11. The course was implemented with the blended learning model. The students studied all five MOOCs and completed the assignments. For the students, there were synchronous meetings three times in the autumn semester – face to face in the autumn of 2019 and via Microsoft Teams in the autumn of 2020.

We collected feedback on three MOOCs in the autumn of 2019 and on four MOOCs in the autumn of 2020. The courses were The Success Story Behind Finnish Basic Education (EDUO102), Educational Support and Guidance Services in Finland (EDUO103), Upper Secondary Education (EDUO1006), and Educational Leadership (EDUO104, only 2020). Students gave both numeric and written feedback. We interviewed two teachers about their experiences of the blended learning model course. The students were also asked to share their thoughts and ideas about what they have learned during the courses. The data consist of the students' responses to the

feedback surveys (N = 24 in 2019 and N = 11 in 2020), the teachers' interviews (N = 2) and the students' thoughts and ideas (N = 24 in 2019 and N = 11 in 2020).

2.3 Data analysis

The students' responses to the feedback surveys were analysed by calculating the averages. The students also gave written feedback, which was analysed by content analysis. We analysed the answers of all four courses. The students' written feedback was classified into the following main categories*:* technical issues, course implementation, and course content.

We used content analysis to examine the teachers' interviews. The unit of analysis was an utterance which is a complete unit of speech (Bakhtin, 1987). The utterances were classified into three categories: students' participation and interaction, pedagogical implementation, co-teaching.

We analysed the students' thoughts and ideas using content analysis. The unit of analysis was a written utterance which originates from the thoughts and ideas of the student. In this study, the utterance is a complete unit of written text. We classified the utterances (N = 236) into three main categories: teaching, equality, and collaboration. The main categories were divided into sub-categories as follows: teaching: child and student centred, teaching methods, assessing pedagogy, and autonomy; equality: equal, and free of charge; collaboration: collaboration in early childhood education, collaboration at the school level, and collaboration of educational leaders.

3. Results

In this study we explored what kind of feedback the students gave on our blended learning course. We also studied teachers' and students' experiences of the Education in Finland MOOCs. The analysis was carried out based on the data.

3.1 Student feedback

We studied the students' feedback from our blended learning course. The students from the blended learning course answered the feedback questionnaire after they had finished each MOOC. Each feedback questionnaire contained a numeric section and an open-ended question.

Numeric feedback

Students rated, on a scale from 1 to 10 the following areas: how useful students considered the material to be (Figure 3) and what the quality of videos and articles was (Figure 4). In both cases, grades (on average) clearly improved from 2019 (N = 24) to 2020 (N = 11).

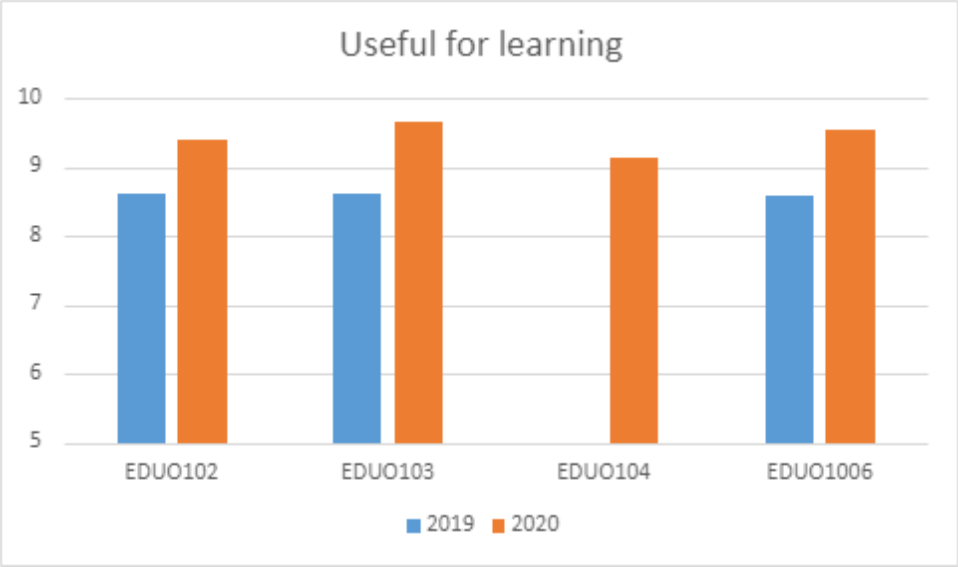

Figure 3. MOOC's usefulness for learning on scale from 1 to 10 (1 = not useful, 10 = very useful). Data collection for course EDUO104 started in 2020.

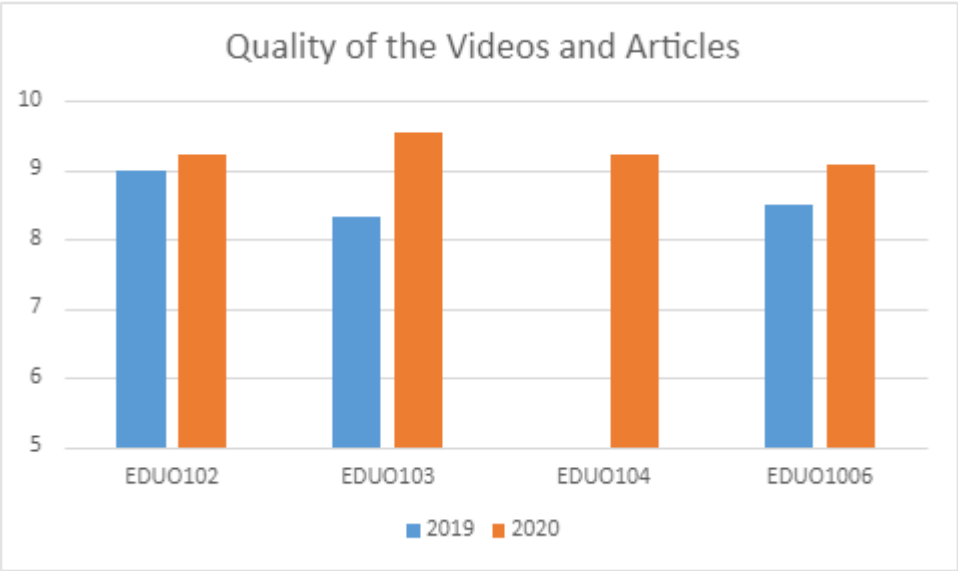

Figure 4: Quality of the Videos and Articles on scale from 1 to 10 (1= not useful, 10 = very useful). Data collection for course EDUO104 started at 2020.

Open feedback: "Tell us how to make this course even better"

The courses were considered excellent or good enough. Students liked and enjoyed the content of the courses. Studying was considered easy and interesting due to a range of materials such as articles, videos, podcasts, and quizzes. They also liked the wide variety of presenters. As such, the course was seen to be suitable for students' different learning styles. Students liked the simplicity and concise approach.

The courses were found to be meaningful and valuable. The contents were explained well, and the interviews of the teachers and students were useful. The history of Finnish education and society was said to be eye-opening and interesting.

However, there were development proposals in many responses, which we analysed in more detail. The development proposals involved the students' ideas for technical improvements, students' feedback on implementation, and course content.

Students' notions on technical improvements

Feedback on technical issues included mostly comments about videos: charts with text that was too small, too many short videos, one student preferred single, ten-minute videos, some Finnish-speaking videos were distracting even though they were subtitled. There were also comments about spelling mistakes, wrong details in quizzes and broken links. Some students commented on the technical features of the Moodle platform, such as waiting time on quizzes.

Students' feedback on implementation

Course implementation raised many developing proposals. Many students wished for written materials and PowerPoint slides in addition to the videos. They commented that quizzes were too easy, some wanted more multiple-choice questions, different kind of quizzes and reflective assignments. Some wished for an exam at the end of the course, more information or reading materials, more discussions, shared assignments, and interaction with guest speakers.

Course content

There were ample comments on the course content. Students wanted more interviews with pupils, examples from the practices of schools, including schedules and student counselling. Some students wanted more information and knowledge concerning the problems and differences between Finnish schools.

3.2 Students' learning experiences

We wanted to explore the students' experiences when learning about education in Finland. Based on the students' responses we identified three main categories which characterise their learning. Next, we introduce our child- and student-centred approach, equal opportunity and collaboration-based pedagogy.

Teaching in Finland is child and student centred

Students paid attention to the following aspects. Teachers create a good environment for children to learn. Every child has their own individual learning plan made by the teacher and needs for each child can be met. The students were surprised by the child-centred nature of the education and how extensive it was, as can be seen from the following example.

At the school level, the wellbeing of students is the focus of the education. The students participate in all parts of the learning process. Students have agency over which courses they take, how personalised and flexible their education is and the fact that they receive training in career management. The curriculum is flexibly organised and personalised. If a student has a learning disability or learning difficulty, that student will not need to feel helpless, because there is always at least one person helping the student at each level.

In Finland, the teaching method is to learn through play. Especially in ECEC, children learning is based on playing and exploring. In Finnish ECEC, teachers use play to make learning more fun and to have the children interact with each other. Some students were critical of the emphasis on play, especially during the pre-primary period of education. They agreed that play is undoubtedly a crucial aspect of a child's socioemotional development and that it should have a stronger place in ECEC internationally. They mentioned that Finland

should not forget the value of knowledge-based learning. However, it must be emphasised that the focus is learning to learn and develop social and emotional skills for better fitting in the society, not only academic skills. At the school level, teaching is more about conveying competence through joy and play. In addition to that, Finnish teachers prepare their students to participate and contribute to an ever-changing world. The phenomenon-based curriculum, in particular, teaches the underlying principles of how to solve problems and how to be creative and cooperate, rather than just focusing on specific subjects.

Assessing the pedagogy

The Finnish education system focuses on assessing pedagogy not by learning outcomes but through the teachers assessing their relationship with the child. This allows the child to grow in a healthier manner, rather than forcing them to take assessment exams or to measure themselves against their classmates, which can cause undue stress and anxiety. The meaning of assessment is not to assess children's skills or abilities, but to assess the way of teaching and teachers' acting. They know what their responsibilities are, what they should teach, and they feel confident because their professionalism is trusted. They always try to work for the best of students, not to catch up with the curriculum or to achieve high ranks in tests. This allows teachers to focus on only students' learning.

Autonomy of teachers and students

In Finland, both teachers and students have significant autonomy. Teachers must adhere to the local curriculum, but they can teach it in the way they think is best. Teachers have the autonomy to organise the class and lessons depending on the group needs in every case. Students also have autonomy from a very young age, and they can work in an independent way as the main characters of their own learning process. Another especially important point is the open-endedness and freedom of the Finnish education system. One decision does not affect the entirety of one's life, but each person has the freedom to change their career and education paths at any point in their lives. Furthermore, the educational leaders have autonomy as the head of the institution. This point has significant meaning when it comes to the power to lead a team which is following the leader. Autonomy as a leader means decisiveness, responsibility, and the ability to care for other people who follow the leaders. Concretely, the head teacher can give other teachers great autonomy in their work but still support them when they need help.

The Finnish education system is equal and free of charge

The Finnish education system is equal and free of charge. For example, the tuition is free and there are free meals for students. The Finnish education system emphasises on the equality of education by maximising the quality of education throughout the nation to minimise the differences of students. The core curriculum of Finland is really to keep equality in all students and still it gives options to students to choose any field as their career. Free and equal access to education ensures that no student falls through cracks and lets students pick their own learning goals. The Finnish education system has no dead ends. General upper secondary school and vocational school can lead to higher education, even though each has different targets and strategies.

Finnish education is based on collaboration

The Finnish education is based on collaboration. For example, in the Finnish early childhood education, an ECEC teacher, a special education teacher, nurses, and assistants work together as a team. Parents are also closely involved in planning and assessing their child's education. Moreover, Finnish education emphasises teamwork among young children, and focuses on the development of young children's ability to succeed in the future society. At the school level, teachers work together and integrate each other's practices to better teach their pupils. Thus, teaching in Finland is cooperative than competitive. The educational leader should have good communication and leadership skills in order to convey educational ideas to various departments

of the school precisely, coordinating the operation of the school. The head teacher must communicate with teachers, students, their parents, and many professions engaged in the education field.

3.3 Teachers' experiences

The blended Education in Finland course was offered in the autumn of 2019 and 2020. Due to the Covid-19 pandemic, the course was offered fully online in the autumn of 2020. When considering the teachers' experiences, we identified three main categories: students' participation and interaction, pedagogical implementation, and co-teaching.

Students' participation and interaction

The cultural background of the students affected their participation behaviour. It demanded careful pedagogical planning before the course started. In 2019, it was easier to encourage students to participate and cooperate, because teaching happened in face-to-face settings. We had enough time to use different pedagogical icebreaker exercises, such as pictures and games, in order to group students. In 2020, online meetings lasted only 45 minutes, which prevented us from using any icebreaker exercises. This meant that in online meetings there was less interaction between participants. In the autumn of 2019 all students completed the course, but in the autumn of 2020 some inactive students dropped out.

Pedagogical implementation

Both courses demanded careful pedagogical planning. In the autumn of 2020, teachers had to rapidly move the blended learning course online. To do so, they created an extra Moodle site for a fully online course. This site included guidelines, PowerPoint presentations, and recordings of synchronous online meetings. In the autumn of 2019, the teachers received several email messages when a student was absent from the face-to-face meeting, which was time-consuming for the course teachers. In the autumn of 2020, teachers created a discussion board where students could ask questions about unclear issues. This decreased the number of emails sent to teachers.

Co-teaching

Teachers found co-teaching to be a positive experience. They viewed working together as fruitful and joyful, with the different teachers complementing each other's work. When one did not know how to continue, the other one jumped in and continued the teaching. While one teacher was teaching, the other could observe the students' reactions. If it seemed the students did not understand the issue being taught, another teacher could clarify it using concrete examples. In a fully online course, teachers worked together the same way as in face-to-face teaching, but the co-teacher could not read the students' body language, so she could not react to it.

4. Conclusions

In this study, we examined students' and teachers' feedback and experiences of a blended learning course. The feedback was positive and constructive. In this blended model of studying MOOCs, the students were interested in the Finnish education system and many of them said they were inspired by it. Some of them thought they could later develop their own countries' education and their own work as a professional in education or other vocational branch. Students obtained new ideas and saw the possibilities of a different kind of educational system. What this feedback shared is the students' eagerness to learn more and gain a deeper understanding of the issue being studied.

The teachers were satisfied with the fully online version, but they would like to develop it further. Teachers found that including face-to-face meetings supported student participation better than synchronous online meetings did. Online, icebreaker exercises are needed to make the interaction more fluent. Based on teacher experiences, this blended learning course needs thorough pedagogical planning. Co-teaching was a wise use of resources because it enabled teachers to concentrate on the students' needs.

We asked students to share their thoughts and ideas about Finnish education. The students were most surprised by the child and student orientation of the Finnish education system as well as the teaching methods based on play and joy. Students mentioned that teaching in their home country remains very teacher led. They also mentioned that in many countries school management is rigidly organised from the top down. Therefore, the great independence of the Finnish teachers aroused surprise and interest. Although students commented that the Finnish education system sounds like some kind of a fairy tale, face-to-face meetings offered a possibility for critical discussion.

One limitation of the study was that we had no available feedback on all of the MOOC courses because we did not collect feedback consistently from the start. Moreover, the number of responding students was small. In the future, we will standardise the feedback questionnaire and use it for every MOOC and in face-to-face meeting.

This study helped us evaluate and develop this blended course. The feedback and students' experiences allowed us to concentrate on essential content as we developed the course further in the autumn of 2019. After changes were made, student satisfaction increased in the autumn of 2020. Students gave us excellent developmental ideas, such as what happens after upper secondary education. At the moment, we are updating all the MOOCs based on student feedback and the latest information. The blended course will be updated accordingly next spring.

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European university networks, internationalisation and virtual mobility

Awareness, Experience and Organizational Maturity of Open Education

Data analysis of different attitudes and preferences

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Abstract
Despite enormous progress regarding OER technologies, many innovative OER-related projects and a growing stakeholder acceptance towards OER, Europe will only make leapfrog advances through a deep integration of OER into a comprehensive multi-stakeholder and sustainable OER ecosystem. Drawing on desk research, expert interviews as well as a pan-European stakeholder survey conducted between June and July 2021, this presentation will provide an overview of the current status quo of OER at the European level with regards to relevant stakeholders in higher education and business as well as emerging themes across important focus topics, including OER Technology, OER Policies & Practice, OER Quality, and OER Innovation & Business Models.
These insights are likely to be of interest to practitioners as well as researchers wishing to gain a stronger understanding of OER in a European context and its value to higher education and business. The presentation contributes to the European Network for Catalysing Open Resources in Education (ENCORE+, 2021), a pan-European Knowledge Alliance funded under the Erasmus+ programme. The project, running from 2021 to 2023, supports the modernisation of education in the European area through OER.

Keywords: OER, open educational resources, open education, attitudes, empirical study.

1. Introduction

Open educational resources (OER) in Europe represents both a success story and unfulfilled potential. One the one hand, more and more organizations and individuals are deciding to go open and make use of its benefits. And at the same time, however, there is a growing unease with noticing that the promises of open education which open educational resources bear, have not yet been fully realized. Conole and Brown argued in 2018 that "current reality is that inertia still exists in many traditional educational structures and a hesitance to engage in new open practices is more common than we typically like to admit." This is true for all education sectors and also for the education and training sector in business although they all follow a different logic. While higher education has made some advancements in the OER field and is benefitting from its innovation and quality potential (Ehlers 2014) more and more, businesses in Europe still remain a largely blind spot on the OER map.
In an effort to bring together businesses and higher education into an innovation alliance across Europe in which the uptake of OER for higher education but also for Education and Training in the

business field can be advanced, the European Network for Catalysing Open Resources in Education (ENCORE+) as a new initiative has been launched. It responds to the European priorities of opening up and modernizing education and training through the creation of a network that supports innovation and entrepreneurship with OER. It builds the foundation for the European OER Ecosystem which can best support innovation and inclusion in education and training; improve digital skills; improve employability; and share the benefits of open online learning with as many Europeans as possible.[1]

The landscape in research, policy and practice of open educational resources and open educational practices (OEP) is rapidly changing. While in the past a substantial body of knowledge has been gathered to understand barriers and challenges of OER uptake (Ehlers 2014), not much has been done in terms of target group-oriented research on attitudes and degrees of awareness, as well as trying to identify individual profiles of expectations and quality sensitivity. Current research is lacking to provide such individual target profiles representing subjective preferences of usage as well as awareness and expectations (Mishra et al. 2016). One crucial factor in the uptake of OER in higher education and business are the different preconditions that various stakeholders bring to the table. Mishra et al. attest to "a need to understand teachers' psychological and behavioral determinants that may influence better use of OER" (2016). Furthermore, Cronin (2017) argues that openness in education is "always complex, personal, contextual, and continually negotiated".

We therefore focus on this theme and aim to understand what motivation and awareness as well as attitudes and capacity different actors have, and how they differ according to their position in the education and training orchestration, if they are education professional or institutional leaders. In our research we therefore ask the question: How can the attitude, the capacity and the awareness of educational professionals and of institutional policy makers be understood, described, differentiated and characterized? In an online survey we asked educational professionals and institutional leaders from business and higher education. A double gap emerges, with attitudes and quality perceptions differing despite similar backgrounds regarding OER awareness, experience, capacity, and organizational maturity. Also, an institutional policy - practice gap can be observed between leaders and professional educators with differing perceptions and attitudes between these groups presenting a challenge to the uptake of OER in higher education and business contexts.

2. State of the art research

The motivation for this research springs from gaps in earlier studies related to OER. Whatever available research on attitude towards OER, they do not try to investigate underlying constructs. Content domain specification and item pool generation are not explained in detail. While much importance has been given to questionnaires and interview schedules, very few used scaling techniques to measure attitudes. Moreover, relevant research findings were not always utilized for constructing sound scales to measure faculty attitude towards OER. Several research studies reported that learning was tempered by teachers' lack of expertise in OER. Petrides, Jimes, Middleton-Detzner, Walling and Weiss (2011) reported that faculty with lower comfort levels in using online technology uses open textbooks in more traditional ways which hampers independent learning among students. But, with arrival of digital technologies, it has become easier for teachers to share their work not only with their students,

[1] **ENCORE+** is the European Network for Catalysing Open Resources in Education which aims to support the uptake and innovation of Open Educational Resources for education and business. ENOCRE+ is an ERASMUS+, Knowledge Alliance project co-funded by the European Commission. Find more information on the project here: https://encoreproject.eu/.

but it has also offered opportunity to share their work globally. More specifically, this development encourages them to further develop, practice and model new behaviors with their students. Therefore, there is a need to understand teachers' psychological and behavioral determinants that may influence better use of OER. Our study involves understanding why some actors share educational resources and others do not. In order to investigate this, we examine the OER perception (use and contribution) by educational processionals and leaders/ managers in higher education and businesses as a combined intertwined psychological construct of attitude, awareness, motivations, and perception of quality. We base our questionnaire instruments amongst others on earlier work from Mishra and his scale to measure Attitude towards Open Educational Resources (ATOER) within the framework of a research project in the global south to explore the use of OER and evidence of impact of OER (Sharma, Mishra & Thakur, 2014). Review of literature is divided on the basis of three sets of constructs extracted from various studies: Awareness of OER, Sharing of Resources, and Adoption and Use of OER.

2.1 Sharing of Resources

A set of studies (Wang & Noe, 2010; Wild, 2011; Rolfe, 2012; Tuomi, 2013) have identified that the OER movement is primarily based on individual's desire to borrow and 'share resources'. Rolfe states that there is a belief in open education, economic reasons and as a reputation enhancer—both for institution and individual—emerged as strong communal drivers for sharing resources (Rolfe, 2012). Additionally, there are several motives behind sharing behavior, such as altruism, prestige and reciprocity, which may motivate teachers to share (Wang, & Noe, 2010). In addition, OER sharing also facilitates self-directed learning (Tuomi, 2013). A sense of belonging, shared purpose, and empowerment are the greatest drivers for sharing resources (Wild, 2011).

2.2 Adoption and Use of OER

A set of studies (Pegler, 2012; Hussain, 2013; Borthwick & Gallagher-Brett, 2014) investigated factors associated with 'Adaptation and use of OER' determining teachers' attitude for engaging in OER. Free availability and reusability of OER, their reduced cost and ease of use are major reasons for teachers to adopt and use OER (Borthwick & Gallagher-Brett, 2014). In addition, amicable technology, teachers' competencies, and their ICT skills also determine grounds for adopting and using OER (Hussain, 2013). For reusing OER, positive environment and availability of appropriate open licensed resources were found to be major factors (Pegler, 2012).

3. Methodological Design

3.1 Survey Design

The survey was conducted as an online survey and contained 42 questions for the target group of professional educators and 37 questions for the target group of leaders and managers. It follows a standardized quantitative approach. The questions were answered on 5- and 6-point scales. The survey also contained some open questions. The survey was available in three languages, English, Spanish, and French. The two target groups of the survey were professional educators as well as leaders and managers. A filter was applied for these target groups. The constructs that were surveyed are awareness, capacity, attitude, and quality preferences.

3.2 Field strategy

The survey was conducted with open field access and was non-organization specific. An unstructured approach was employed. Linked-in contacts as well as other contact groups were directly selected and addressed to participate in the survey. For this purpose, direct mailings were used as well as general invitations that were sent out by email. Reminders were sent out to raise awareness of the survey, as well as messages on social media and newsletters.
The ENCORE+ project partners contributed their contacts from six countries and the survey was accompanied by weekly monitored activities between all eight partners. The field phase lasted from June to August 2021.

3.3 Sample Selection and response rate

The survey addressed two target groups, leaders and managers from higher education and business, as well as professional educators from these sectors.
The target groups of leaders and managers in higher education or businesses addressed institutional policy and decision makers such as rectors, deans, vice-presidents, board members, and heads of departments. For the second target group, professional educators in higher education were addressed, such as teachers, OER creators, researchers in the field, curriculum developers, and quality professionals, as well as in business, such as HR professionals, and training and development managers.
The survey was conducted with an unstructured field access. An explorative approach was employed since the survey results are based on a non-representative sample. The overall number of invitations to participate in the survey is not known, since there was no tracking of the different online channels and distribution mechanisms. In total, 4485 persons reacted to the invitation, of which 380 took the survey. This results in a 8,5% realization rate. Of these, 261 data entries could be used since respondents answered until the threshold of the third question, leading to a cleaned response rate of 5,8%.

3.4 Operationalization

The survey was structured around six clusters: awareness, experience, organizational maturity, capacity, attitudes, and quality perception. These clusters are based on the *Attitude towards Open Educational Resources* (ATOER) scale that was developed by Mishra et al. (2016). Responding to the need for a way to measure attitudes towards OER by considering underlying constructs, they developed a scale focusing on the constructs of the sharing of resources and the adoption and use of OER. For our survey, we took this scale as a basis and adapted it by building on further research which is outlined in section 2.

Table 1: Operationalization of survey items

Awareness		• **Aware** of OER
Personal experience		• with **using** existing OER for teaching / training / learning • with **creating** OER and sharing / publishing them

		• with **adapting** existing OER to fit needs for teaching / training / learning
Organizational maturity	**Existence of Initiatives/projects/ networks**	• existence of OER **initiatives and projects** • Involvement in **networks** that share OER
	assessment of implementation	• perception of **relevance** of OER in organization • **implementation** of OER through **strategy and policy** • **inclusion** of OER in business model • **Skills and confidence** of professional educators in company regarding OER • Application of **quality concepts** for OER
Capacity		• Learn to make use of OER **quickly** • Finding the use of OER **easy** • Sufficient **knowledge of intellectual property rights** • **Use** of OER for teaching / training • Ability to **assess quality**
Attitude & Motivation	**Individual benefits motivation**	• Improve **professional respect/reputation** • **pleasure** if other people adapt one's OER • enhance **visibility** • improve **sense of achievement** • market and **disseminate ideas**
	Social/Altruistic motivation	• **Giving back** to society • contribute to the basic **human right** of access to knowledge • **responsibility** to share created resources
	time/cost/time motivation	• using OER to **save time** • using OER to **bring down costs**
	collaboration motivation	• opportunities to establish **new partnerships** • enable **quality improvement through feedback** • increase **network** and sphere of influence • **Encourage others** to share as well
Quality perception & expectations		• Prefer OER from **trustworthy source** (e.g. repositories) • Prefer OER from **personal recommendation** (e.g. colleague) • Prefer OER with **official certification** (e.g. seals or stamps) • assess OER based on **personal evaluation** and quality judgement

4. Results of the empirical survey

4.1 Overview on Awareness, Experience and Organizational Maturity of Open Education

Awareness lies at the center of the model for open learning culture on which this survey is based. Just like there is a wide array of stakeholders involved with OER, the awareness of OER and their potential varies significantly. The Commonwealth of Learning points out that "although awareness of OER is increasing, there is still a general lack of awareness among stakeholders about the relevance of OER and, in some cases, about what OER is" (COL, 2017, p. 59). Especially in the business context, OER are still very much a blind spot. This is mirrored in the participation in our survey with about eight times as many participants from the higher education sector as from the business sector.

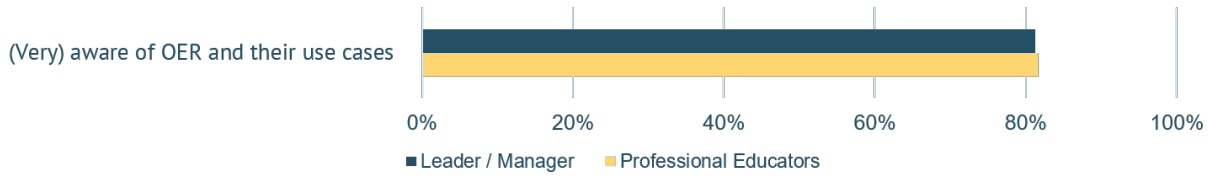

Figure 1: OER Awareness, n(L/M)= 59, n(PE)= 202, dichotomized 5 point scale by collapsing responses for 4 and 5 from the original scale (4= I am aware of OER and some of their use cases, 5=I am very aware of OER and know how they can be used in a class or training situation.)

As mentioned above, the participants of our survey display a high awareness of OER, the leaders and managers as well as the professional educators. More than 80% of the leaders and professional educators who participated in our study expressed to be aware or very aware of OER. This allows us to draw conclusions regarding the other components of the model based on a group of participants who have a rather homogeneous background regarding their awareness of OER.
Personal and organizational experience with OER, as well as the level of organizational maturity when it comes to OER are crucial structures necessary to establish an open learning culture. In the data gathered in our survey, a gap in perception emerges between the leaders and managers on the one side, and professional educators on the other side.

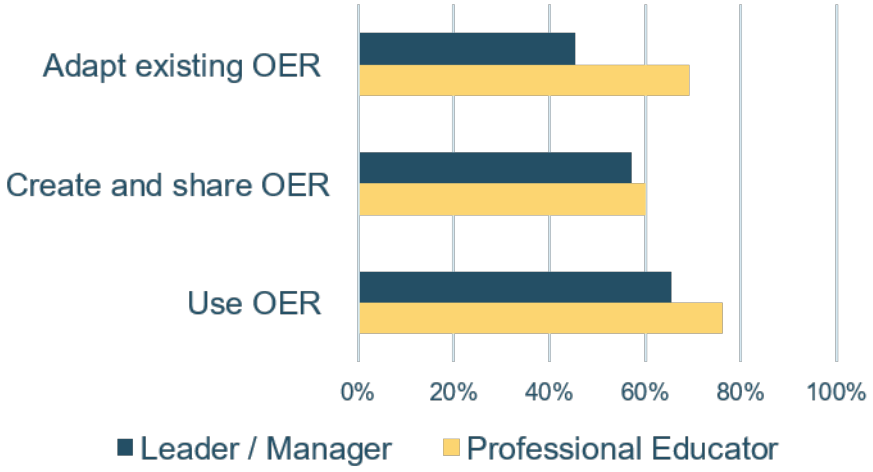

Figure 2: Personal experience, n(L/M)= 54, n(PE)= 164, dichotomized 4 point Likert scale by collapsing responses for 3 and 4 from the original scale (3=occasionally, 4=regularly)

On the one hand, professional educators rated their **personal experience** level in adapting, creating, sharing, and using OER as higher than leaders and managers assessing their organizations' experience

levels in these areas. Leaders and managers seem to underestimate the level of OER expertise in their institution or business. While 69% of the professional educators said to regularly or occasionally adapt existing OER to fit their needs, however, only 45% said the same about their organizations' experience level with adapting existing OER.

Figure 3: Organizational Maturity, n(L/M)= 52, n(PE)= 164, dichotomized 5 point Likert scale by collapsing responses for 1 and 2 from the original scale (1=strongly agree, 2=agree)

A different picture emerges when asked about the **organizational maturity** regarding OER. The graph above displays aspects of **implementing** OER in an institution. These include whether OER are perceived as a relevant part of the organization, whether it is implemented through policy and strategy, and whether they are included in the business model. Furthermore, it asks whether the professional educators in the organization have the skills and competencies to use OER and whether there are quality concepts in place. Overall, leaders and managers perceive a significantly higher level of implementation of OER in their respective organizations than the professional educators.

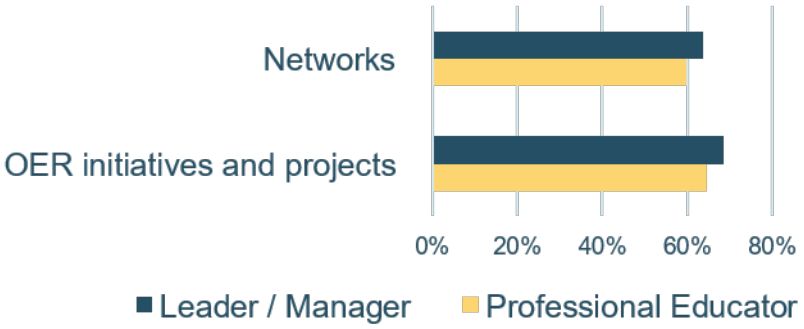

Figure 4: OER projects and networks, n(L/M)= 55, n(PE)= 173, 3-point scale

The same picture emerges when asked about the existence of OER **projects** and **initiatives** in the organizations, as well as the organizations' involvement in OER **networks**. Leaders and managers answered more often with "yes" when asked about the existence of OER projects and initiatives in their organizations than the professional educators did.

4.2 Capacity for Open Educational Resources

The respondents of our survey overall feel fairly confident to make quick use of OER and feel informed about intellectual property rights in order to understand OER, as is displayed in the graph below. This is not surprising, since the majority of the survey respondents are already aware of OER and experienced in using them. However, even amongst this group, a significant section does not find OER easy to use and does not feel confident to assess the quality of OER.

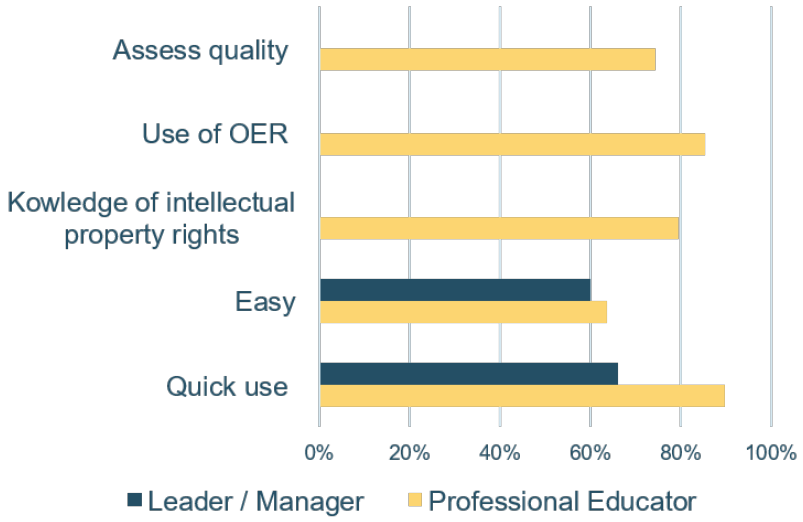

Figure 5: Capacity for OER use, n(L/M)= 48, n(PE)= 156, dichotomized 5 point Likert scale by collapsing responses for 1 and 2 from the original scale (1=strongly agree, 2=agree)

4.3 Open Attitudes for Open Educational Resources

Stakeholders' attitudes towards OER are crucial in catalyzing the uptake of OER in education and business. Our survey has shown that a positive attitude often comes with a high awareness of OER, especially amongst professional educators. Research shows that a wide array of motivational aspects factor into the decision to use and share OER, all of which should be addressed in efforts to promote the uptake of OER.

While some aspects stand out as especially important regarding personal or organizational motivation to use and share OER, a gap between the leaders and managers on the one side, and the professional educators on the other side emerges. It further becomes apparent that motivations differ between the business sector and that of higher education.

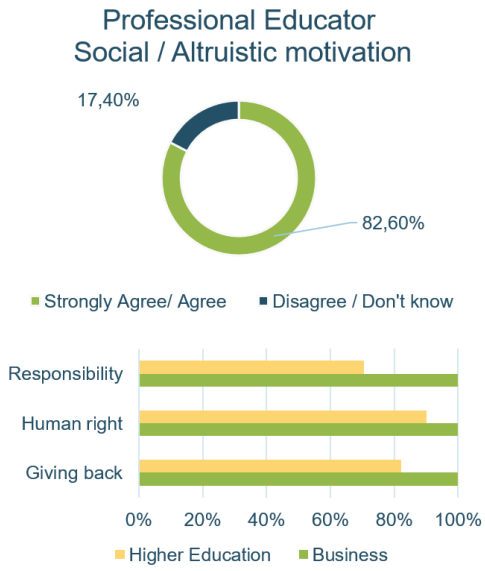

Figure 6: Social/Altruistic Motivation of Professional Educators, n(HE)= 135, n(B)= 7, dichotomized 5 point Likert scale by collapsing responses for 1 and 2 from the original scale (1=strongly agree, 2=agree)

Figure 7: Social/Altruistic Motivation of Leaders and Managers, n(HE)= 39, n(B)= 11, dichotomized 5 point Likert scale by collapsing responses for 1 and 2 from the original scale (1=strongly agree, 2=agree)

Overall, **social and ethical concerns** are strong motivators to use and share OER, amongst leaders as well as amongst professional educators. Amongst the professional educators, factors such as social responsibility, education as a human right, and giving back to society were strong overall, especially in the business sector. As the graph above displays, over 80% of the professional educators strongly agreed or agreed with the importance of these social factors.

Amongst the leaders and managers, a similar picture emerges for this area. 82% of the respondents from higher education and business agreed that OER contribute to the basic human right of access to knowledge.

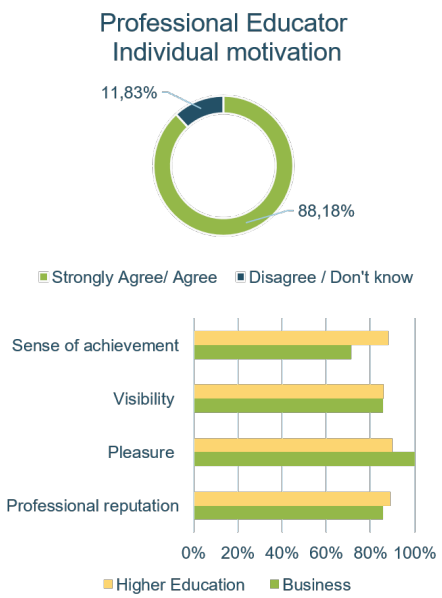

Figure 8: Individual Motivation of Professional Educators, n(HE)= 135, n(B)= 7, dichotomized 5 point Likert scale by collapsing responses for 1 and 2 from the original scale (1=strongly agree, 2=agree)

Figure 9: Individual Motivation of Leaders and Managers, n(HE)= 38, n(B)= 11, dichotomized 5 point Likert scale by collapsing responses for 1 and 2 from the original scale (1=strongly agree, 2=agree)

Gaining **individual benefits** through sharing and using OER proved to be a strong motivator, especially for professional educators. On average, they are motivated by their personal sense of achievement, and gaining visibility, pleasure, as well as professional reputation through OER. Overall, 88,18% of the professional educators from business and higher education agreed or strongly agreed with these aspects.

Amongst the leaders and managers, only 74,3% agreed or strongly agreed that aspects of individual motivation played a role for them. In this case, the question was whether OER help to market and disseminate their organisation's ideas, and whether the sharing of educational resources created by their organisation enhanced their organisational reputation. However, while these motivators are not as strongly shared by leaders and managers overall, business leaders do highly value the opportunity to market and disseminate their organizations' ideas and to enhance their organizations' professional reputation by sharing OER.

Figure 10: Collaboration Motivation of Professional Educators, n(HE)= 135, n(B)= 7, dichotomized 5 point Likert scale by collapsing responses for 1 and 2 from the original scale (1=strongly agree, 2=agree)

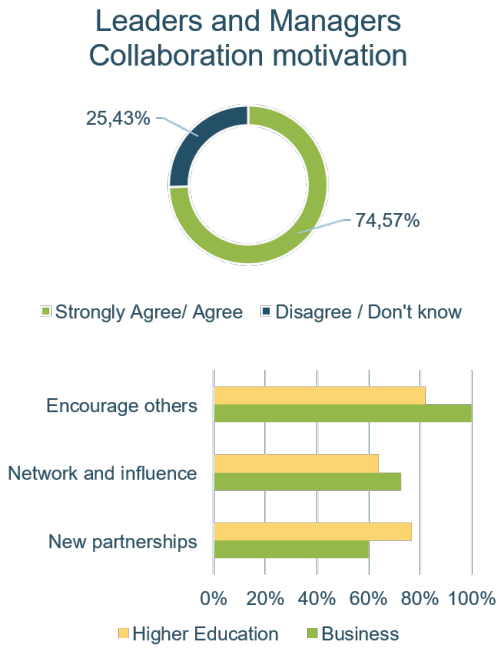

Figure 11: Collaboration Motivation of Leaders and Managers, n(HE)= 39, n(B)= 11, dichotomized 5 point Likert scale by collapsing responses for 1 and 2 from the original scale (1=strongly agree, 2=agree)

The opportunities for **collaboration** through OER are valued especially by the professional educators. Here, a difference between the higher education sector and businesses becomes apparent. Especially professional educators from higher education value the opportunities to encourage others to share their resources as well, to strengthen their network, forge new partnerships and improve their own resources through continuous feedback. Amongst leaders and managers, these factors do not weigh quite as heavily overall.

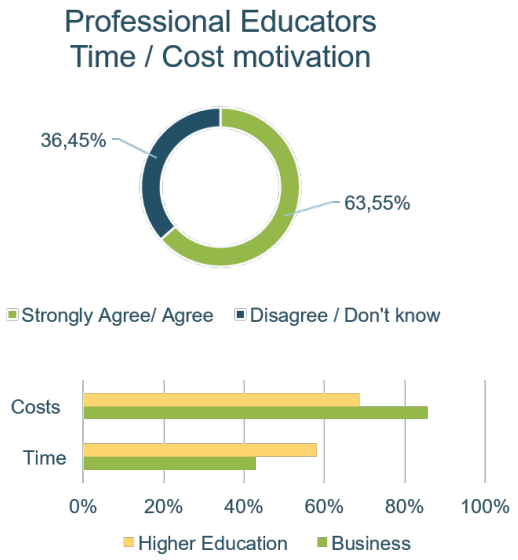

Figure 12: Time/Cost motivation of Professional Educators, n(HE)= 136, n(B)= 7, dichotomized 5 point Likert scale by collapsing responses for 1 and 2 from the original scale (1=strongly agree, 2=agree)

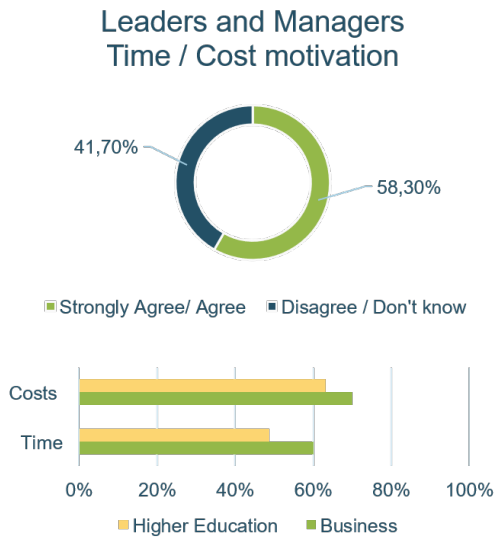

Figure 1 Time/Cost motivation of Leaders and Managers, n(HE)= 39, n(B)= 10, dichotomized 5 point Likert scale by collapsing responses for 1 and 2 from the original scale (1=strongly agree, 2=agree)

The issue of **saving time and money** does play as big a role amongst professional educators as well as leaders as one might expect. Only a little more than two thirds of the professional educators in our survey agreed or strongly agreed that OER saved them time and money. Amongst the participants with a business background, however, the issue of cost saving was rated highly.
A similar picture emerges amongst the leaders and managers, where even less think that OER save time and money. Again, the participants from the business sector see a higher potential for cost and time saving.

4.4 Quality perception of OER

Figure 15: Quality perception of OER, n(L/M)= 52, n(PE)= 156, dichotomized 5 point Likert scale by collapsing responses for 1 and 2 from the original scale (1=strongly agree, 2=agree)

Besides the questions of attitude and motivation, the ability and confidence to assess the **quality** of OER presents one of the key challenges in the uptake of OER. Allen and Seaman have found that "two key qualities faculty consider when selecting learning materials for their students are proven efficacy and trusted quality" (as cited in Hilton 2019, p. 854). It is therefore crucial to enable users to confidently select high-quality OER and thereby instill trust in these resources.
The aspect of quality serves as one example of the gap between having comparable organizational structures and awareness levels on the one side, and differing attitudes and quality preferences on the other side. Despite coming from a rather homogeneous OER-affine background, the respondents of our survey expressed vastly differing quality preferences and perceptions when asked for their preferred selection criteria for OER. While over 80% of the professional educators trust their own evaluation the most, trustworthy sources such as repositories as well as personal recommendations were also favored by many. Furthermore, the institutional policy - practice gap emerges here as well, with leaders and managers expressing differing views from professional educators on appropriate ways to select high quality OER.

5. Discussion and Conclusion

5.1 Picturing the different stakeholders' attitudes in the OER environment – Three perspectives

Our research shows that education professionals differentiate their perspectives towards open educational practices into different attitude groups. Amongst those who are not generally opposed to the concept of open educational practices, three main attitudes can be observed.

Activist Florence – open to share everything

For Florence, sharing her educational materials and her experiences is a natural act of her own perception as an education professional. She is open to share the content she creates and also uses OER shared by others. She does not rely on encouragement through her organization or direction provided by policy.

Pragmatic Lena – waiting for organizational support

Lena is generally open to embrace the concept of open education practices. That means sharing her educational materials as OER or using materials shared by others. However, she finds it important that her organization is providing general support, training and infrastructure for open educational resources. This can be represented in open policies through an organization-wide repository for OER or training how to use and adapt OER to her own context. She is not an OER activist or particularly enthusiastic about the concept but views herself as a pragmatic professional who wants to implement the organization's policies. She doesn't particularly like to support processes and educational practices which are not officially supported through her organization.

Low- aware Nils – not opposed to OER

Nils has nothing against sharing nor against OER. He has, however, very little awareness of OER. He's also not particularly fond of sharing but as a pragmatic professional, he has nothing against it. If it serves his course and benefits his purpose, saves time and cost, he would pragmatically decide to support OER.
Going hand in hand with the increasing normalization of OER, the persona of Nils gains more and more importance. With OER moving into the mainstream, not every user will be or even has to be an enthusiastic proponent of OER. Focusing on this group of users holds enormous potential in fostering the uptake of OER in higher education and the business sector.

5.2 A Double Gap for Open Learning Cultures

The research we conducted among leaders and managers as well as professional educators from business and higher education institutions show that there are differences in attitude, capacity and awareness. The results contribute to understanding better the complex web of personal and organizational prerequisites and attitudes as well as quality perceptions of OER that stakeholders bring to the table. The following model is informed from the findings and shows a double gap (fig. 16). On the one side, the structures are displayed that are necessary for the uptake of OER and open practices. We focused our analysis on previous personal experience with OER, the capacity to use OER, and the level of organizational maturity regarding OER. On the other side, there are the indicators of commitment to OER, where we focus on the attitude and motivation to use OER, and the quality perceptions and expectations towards OER. The survey addressed two different groups of

respondents, leaders or managers and professional educators, from two sectors, business and higher education. Judging from the high awareness of OER amongst the participants, the survey reached an audience that is very involved with OER already.

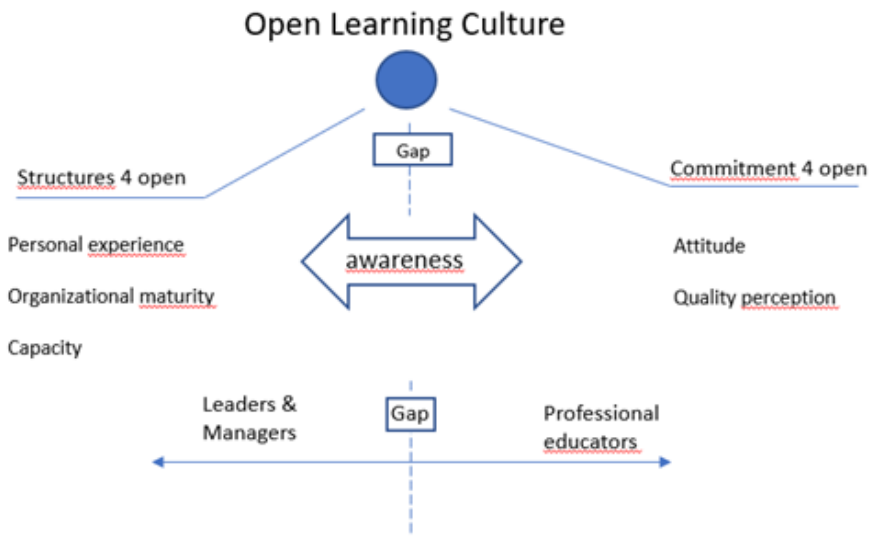

Figure 16: Open Learning Culture, adapted from *Open Learning Cultures: A Guide to Quality, Evaluation, and Assessment for Future Learning*, by U.-D Ehlers, 2013, Springer Berlin Heidelberg.

The results from the stakeholder survey show two gaps emerging within the model displayed above:

1. Even amongst OER enthusiasts, who are aware of OER and oftentimes share a similar background regarding their personal experiences with OER and their organizations' maturity in implementing OER, attitudes and quality perception of OER differ. There is a gap between having open structures in place and these structures automatically leading to a predetermined commitment to OER.
2. Another gap can be observed between leaders and professional educators, which can be described as an institutional policy - practice gap. Differing perceptions and attitudes between these groups present a challenge to the uptake of OER in higher education and business contexts.

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Creating value in continuous digital education - Setting standards for learning opportunities based on collaboration, openness, and modularity (Calibri, 14 pt, bold – colour 45/149/167)

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Abstract
In 2019, the AI-Campus (German KI-Campus), a learning platform on artificial intelligence has launched as an R&D project funded by the German government (www.ai-campus.org). At the centre of the three-year pilot phase is the development of a digital learning platform specializing in the field of artificial intelligence. The platform has published first Open Educational Ressources (OER) content in July 2020 and is planning to develop more than 40 openly licenced courses and other OER content on the topic of AI by early 2022. For this purpose, AI Campus collaborates with more than 50 higher education institutions and other partners from Germany and Luxembourg.
The AI Campus focuses on three key target groups, students professionals and lifelong learners in general, with different needs: While students are interested in obtaining ECTS whose recognition is clearly embedded in a formal framework, lifelong learners are interested in credentials which are of value i.e., to (potential) employers. To create valuable credentials in both contexts, the AI Campus focuses on openness and modularity of learning opportunities as well as on close collaboration with key stakeholders during the development of learning opportunities from online and blended learning courses up to microdegree programs.
The workshop aims to explore how the needs of the above-mentioned target groups can be better addressed if learning opportunities are standardized, modular and open which makes them integrable and combinable in overarching learning scenarios and settings, leading to higher value in recognition. This is closely connected to the question of how international collaborations between providers of digital learning can be developed to enable an even higher level of standardization and interoperability, which will also be subject of the workshop.

Keywords: OER, micro-credentials, lifelong learning, quality assurance

1. Introduction

The AI Campus (German: KI-Campus) is a learning platform for Artificial Intelligence with free and openly licensed online courses, videos and podcasts on various AI topics. As a research and development project, the AI Campus is funded by the Federal Ministry of Education and Research (BMBF). The Stifterverband, the German Research Center for Artificial Intelligence (DFKI), the Hasso Plattner Institute (HPI), NEOCOSMO and the mmb Institute have been developing the AI Campus together with numerous partners from the German Higher Education landscape and the startup scene since October 2019.

Mike Bernd is a social scientist with a strong focus on emotion research and concepts of intercultural and (digital) education. In a cooperation program between the University of Applied Sciences Hamburg and the University of Shanghai for Science and Technology, he was co-responsible for the development of a collaborative German Chinese learning ecosystem. After his return from China, he was responsible for quality assurance at Kiron Open Higher Education. In the AI Campus project, he is involved in the quality assurance of the educational product, and he coordinates the development of learning opportunities with the content partners.

Stefan Göllner has a background in design-research and digital product development with employments at Academy of Media Arts Cologne, Telekom Laboratories Berlin, Academy for the Arts Berlin and Technical University Berlin. As an Innovation Manager at AI-Campus he connects experts, driving the most relevant topic areas for Artificial Intelligence, with the objective to improve AI education and to blueprint requirements for a next generation of AI supported learning management systems. He leads the second fellowship program of AI Campus and works on the development of an AI Campus playground to foster practice-based and explorative learning.

2. Setting the frame: Digital content creation and quality assurance

The **AI Campus** – the learning platform for artificial intelligence – pursues the vision of an AI-competent society. This open approach, with the claim of providing innovative digital learning opportunities on an academic level, holds chances and challenges on different levels. In line with the vision, the AI Campus wants to address broad and heterogeneous target groups with its learning offerings focusing students, professionals and lifelong learners. They all need to be served according to their different needs regarding suitable learning opportunities.

Today, **digital ecosystems** offer the opportunity to serve a wide variety of learning types with diverse, varied, and learning goal-oriented (learning) formats in the context of formal and non-formal learning. At the same time, based on fine-grained learning analytics, weaknesses in learning designs and content can be identified and learning gaps among learners can be detected. This enables a more precise development and adaptation of learning to the needs of the learners. Based on this, customized learning formats can be developed that can be used by students self-paced or be integrated as learning content in on-site or virtual teaching and learning settings.

However, the increasing possibilities of such **Smart Learning Environments** (SLE), consisting of **Learn Management Systems** (LMS) with more and more additional features, also contain challenges (Kinshuk et al.,

2016). In the field of quality assurance, overarching standards must be developed in line with current and future developments to enable the integration of digital learning offerings into university curricula. On a higher and formal level, the tools defined in the European Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) and in the ECTS Users' Guide already help here. Based on workload, learning objectives and ECTS, online courses and university lectures are comparable, thus enabling the integration of these digital learning opportunities in curricula.

At the more granular level of online courses and specifically learning formats – and specifically the formats they contain, from text elements to videos to assessments – the picture is far more diverse. Instead of clear and standardized quality criteria, educational institutions refer to different and individual design principles when creating digital learning content. Due to the lack of clear guidelines and frameworks and in order to provide a basic orientation for the content-producing institutions of the AI Campus, key quality criteria for content production have been formulated (See Figure 1). At the same time, a key account management has been established to ensure compliance of the standardization process on the digital learning ecosystem. However, the process remains complex and difficult due to the lack general standards and evaluation criteria on the level of course design and digital content production. Therefore, the problem remains that online courses and MOOCs in particular still often do not meet the basic standards to be integrated into curricula (Margaryan et al., 2014).

Key quality criteria for content production at the AI Campus

1. Don’t reinvent the wheel: Review existing learning offers on the platform and design your course based on them instead of producing the same content from scratch. Learning offers should refer to each other if possible.

2. Set up a main thread: Create an overview of the course content and learning objectives. Prepare storyboards to structure the course appropriately.

3. Keep it simple: Complex course structures can feel overwhelming or demotivating: Courses should contain at most 10 modules, modules at most 15 elements. Too much content? Create a successful sequel!

4. Keep learning objectives in mind: Define concrete LOs in advance for the course **and** the individual modules. Content and exercises should be based on learning objectives to support the acquisition of competencies.

5. Professional standards: Make sure your content is correct and terms are used consistently. Check facts, consistency and orthography before you start creating material.

6. It`s the media mix! Use video, audio, text and images in a balanced ratio that supports the learning process. More in-depth materials can be linked. Pro- mote the course with a teaser video.

7. Quality over quantity: Develop only high-quality media that learners will enjoy using, watching, and listening to! Note: Videos should last at most ten minutes.

8. No multiple-choice monoculture: Variety supports the learning process. Use different types of exercises to create an innovative learning experience! Get inspired by, e.g. the variety of possibilities in H5P.

9. Living diversity in language & media: You aim to reach a diverse audience - represent societal diversity in examples. For guidance on using gender-inclusive language, see our guidelines.

10. Who invented it? At KI-Campus, learning offers are published as Open Educational Ressources (OER) under CC-BY-SA 4.0. Accordingly, clarify the open licensing of all materials you use.

Fig. 1: AI Campus key elements for online course development

Similar applies to the growing field of so-called **microlearning**. Microlearning formats include a wide variety of smaller, often low-threshold learning opportunities for flexible engagement with subject-specific content. These differ from simple formats such as articles, studies, or purely informative videos by a focus on the learning processes and acquisition of competencies (Baumgartner, 2013). Learning videos, for example, which can be made available to a large target group via video platforms, have gained particular importance in recent years. Podcasts have also received increasing attention since the COVID 19 pandemic at the latest. With episodes of the learning podcast series **Dr. med. KI** on AI Campus such a microformat is integrated into medical teaching i.e., at Charité – Universitätsmedizin Berlin, one of the largest university hospitals in Europe. There are a variety of other formats that can be subsumed under microlearning which include simulations, programming tasks and quizzes, which can be used as (open) educational resources by learners or teachers for their individual teaching and learning processes (Mosch et al., 2021). An overview of different formats on the AI Campus beta version is shown in Figure 2.

In the context of modular and sustainable content development, the AI Campus considers microlearning formats as building blocks for the creation of larger learning units, which enable the creation of **micro course formats,** or more comprehensive **online courses,** or **MOOC**s that, amongst others, makes them embeddable in university lectures and workshops. Accordingly, the stand-alone character of the microlearning formats should also enable learners and teachers to create their own “playlists”, which can be used to structure individual learning processes or that of learning groups in digitally enhanced teaching and learning settings.

Regarding **formal quality assurance**, aspects such as workload, learning outcomes, assessment and intended social form of the formats (individual or group formats) play a central role, as they define the setting in which learning takes place (Baumgartner, 2013). Ideally, there are also instructions that describe how the elements can be integrated in live settings. These predefined framework on the fine-granular level of microlearning enables a structured and formal embedding in overarching teaching and learning scenarios by forming a constructive alignment on the conceptual level (Biggs et al., 2011). This makes the tools of the ESG and the ECTS Users' Guide applicable and a recognition of the “building blocks” in digitally enhanced learning is formally possible. Nevertheless, the problem remains that the formal framework says little about the actual quality of the content, as this is aligned with various learning design principles of respective developers or developer teams in a growing field of content producing institutions (Gaebel, 2021).

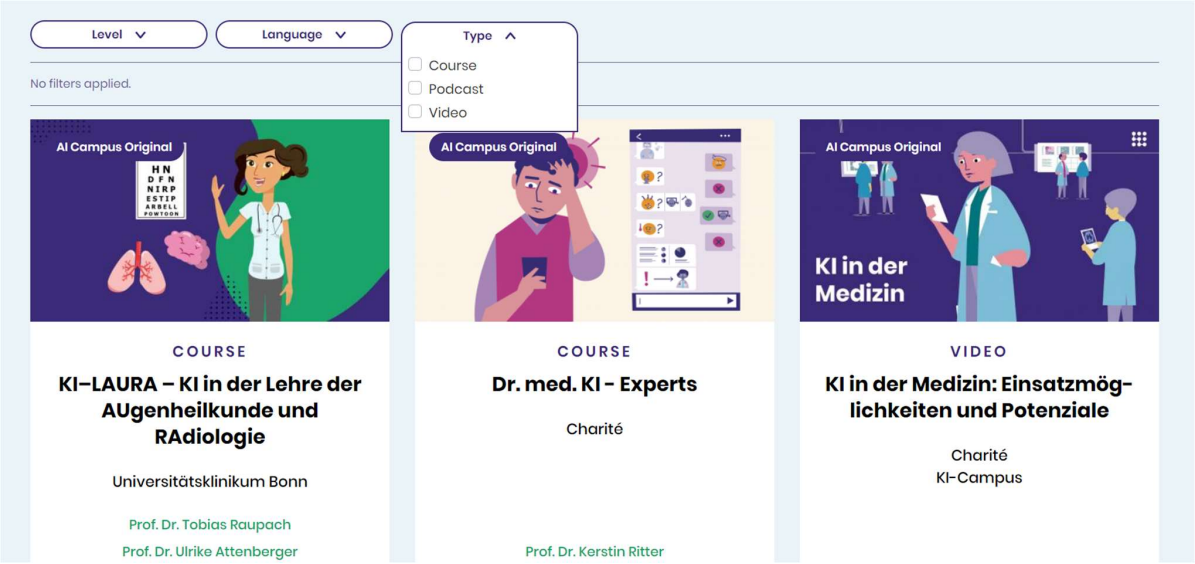

Fig. 2: Learning Formats on the AI Campus

Thus, both at the level of online courses and microlearning, standards are needed to best meet the needs of learners and instructors and to support the learning process in the best possible way. The development and implementation of these **qualitative standards** can only be ensured through cross-institutional collaboration. This provides the opportunity to build trust in the quality of these digital formats and to justify recognition and certification in the context of higher education teaching and further education. Last but not least, **open licensing** in the sense of OER materials is necessary so that the content can be adopted and applied in overarching settings.

3. Focus on the learners and lecturers: Target groups

The AI Campus, like many other learning platforms and digital learning ecosystems, has broad and heterogeneous target groups that have very different needs in terms of learning, certification and recognition of learning achievements. **Students** primarily pursue the goal of acquiring competencies by means of learning opportunities that are more comprehensive in terms of workload and allow for recognition at Higher Education Institutions (HEI) of credits. Microlearning can also help students, i.e., to prepare for examinations in a needs-oriented and targeted way, while recognition of learning achievements is not the main focus. Digital microformats have thus the potential to support and enrich self-directed learning and creating a more holistic learning experience that addresses both formal and non-formal learning.

At the same time, **lecturers** at HEIs can be offered the opportunity to digitally enhance their courses and create a more learner-centric student experience based on digital microlearning formats (Semingson, 2015). In this setting of digitally enhanced learning, microformats can form components of recognizable academic achievements. The use of digital learning formats in teaching and learning contexts at HEIs makes quality assurance an integral component regarding the development and use of digital content (Gaebel 2021). Additionally, experiences of the AI Campus show that it is useful to offer handouts to lecturers, describing

possible scenarios of microformat integration. This supports adequate use and helps in planning and structuring the teaching units.

Lifelong learners specifically in work-based contexts, often hardly have the time to complete MOOCs with a high workload. In the context of reskilling and upskilling, they need smaller formats that lead to the acquisition of competences (Nic Giolla Mhichíl, 2020). Furthermore, professionals are less interested in obtaining credits awarded by HEIs. Instead, they need credentials or certificates that are relevant for (potential) employers. Doctors in Germany, for example, have to collect and provide evidence of continuing medical education ("CME points") offered in structured learning settings and based on predifined standards established by the medical associations (Landesärztekammern) of the different German federal states. The system of continuing medical education in Germany exists largely independently of university medical education (Boethin, 2017).

In less structured fields of reskilling and upskilling, where a clear system of continuing education is not established, professionals must be guided by whether learning opportunities and associated credentialing or certification have value to (potential) employers. This is a difficult undertaking, as the market of learning opportunities and educational institutions is fragmented and diverse (Nic Giolla Mhichíl, 2020). The lack of standardization makes it difficult for learners to choose what is most relevant to them and if it leads to the intended acquisition of competences. Furthermore, it's hard to gauge which certificate or credential will help, i.e., in finding a job or getting a promotion. As a result, learners are largely left to their own devices, both in terms of the quality of the learning offered and in terms of recognition from (potential) employers. This is due to the lack of clear frameworks and/or an overarching network of relevant stakeholders, which are able to create trust in obtainable credentials.

4. Dividing the field: Digital Formats

Digital formats, and digital learning formats in particular, have a major impact on how people learn today and will learn in the future. The variety and variance of digital content is constantly increasing and is related not only to new technical environments and tools, but also to new forms and cultures of learners' acquisition of knowledge and competencies through digital learning. As described above, the development of necessary frameworks that provide guidance to learners and teachers can hardly keep pace. Therefore, new ways of systematizing learning formats and qualification models have to be developed and new ways of cross-cutting cooperation between higher educational and non-higher educational institutions have to be found.

To develop a common understanding with all stakeholders of the AI Campus, a model on digital formats, qualification and credentialing was developed, which is shown in Table 1 (Mosch, 2021). Wannemacher et al. (2016) describe and distinguish a total of 16 "digitized [...] learning elements and formats" in their study "Digital Learning Opportunities on Artificial Intelligence" where it has been divided into online and digitally enhanced learning settings (Wannemacher p. 61, 2016). The AI Campus model brings together these approaches to digital formats that consider goals associated with the format and the degree of inherent learning design (Mosch p. 13, 2021). The result is a simple systematization of digital formats divided into three overarching objectives and expectations out of the learners' perspective: **1) Information and knowledge acquisition, 2) Acquisition of competences, and 3) Qualification and credentialing**.

Objectives	Digital Formats (exemplary selection)
Information and knowledge acquisition	**Digital Knowledge Databases** (Collections of Information or Micro Formats) **Microformats** (Textbased, Datasets, Videos, Podcasts, etc.) **Online courses / Massive Open Online Courses (MOOCS)/** **Online-Information-Events** without a clear learning design
Acquisition of competences	**Microformats** (Learning Videos, Learning Podcasts, Quizzes, Tasks, Simulations, Programming Tools, etc.) **Online courses/MOOCS (without credentials)** with a clear learning design **Digitally enhanced lectures (hybrid lectures)**
Qualification, certification and credentialing	**Micro-Credentials** **Micro-Degrees** **Online courses and digitally enhanced lectures**

Table 1: Systematization of digital formats (Mosch et al., 2021)

Information and knowledge acquisition based on the need for specific and targeted information required in student and work-based contexts and everyday life. This need is often best met through thematic online repositories that offer microformats such as written articles, video and video tutorials, or podcasts. More complex formats such as webinars or online courses with little or no learning design also fall into this category.

Acquisition of competencies: Structured learning activities rooted in the concrete goal of solving a particular problem (problem-based) or work-based task. The focus here is less oriented on certification or credentialing of an acquired skill or competence but on the acquisition of a concrete competence to solve a problem in student contexts, work-based settings or everyday life.

Qualification, certification and credentialing: The goal is to obtain recognizable evidence of skill or qualification attainment in the form of micro-credentials, badges, or certificates (HRK, 2021). Again, learners' goals and needs are broad in this context: students in higher education who need formal certification after completing learning opportunities to have achievements recognized in their respective studies. (Future) professionals who need evidence for the application process or who seek professional improvement based on evidence of acquired skills and competencies. Other lifelong learners who want evidence as self-affirmation of goals achieved in structured teaching and learning contexts. The last two groups mentioned in particular require the records of achievements in various forms so that they can be shared, for example, on job platforms or in social media. Since this involves sharing credentials in digital ecosystems, technical interoperability must also be considered.

For educational institutions that want to enable various forms of qualification, certification and credentialing, it forms the challenge of what framework to invoke and how to implement a system of quality assurance that enables recognition of those certified achievements in the various learning contexts and digital ecosystems.

5. Addressing the challenges: Collaboration, Modularity and Openness as key success factors for digital and digitally enhanced learning

Collaboration on the international level of the EHEA can address the problem of a lack of qualitative standards in learning opportunities and content. Collaborations also enable the trust in certificates and credentials being offered as frameworks of quality assurance are implemented in an overarching way. Furthermore, closer cooperation in networks between educational institutions and companies can help to align learning opportunities more closely with work-based requirements and thus ensure a more targeted skill and competence orientation. Collaborative content development has the further effect that learning content can be used both in the university context and in continuing education. In this way, a quality assurance of the learning opportunities can be established that includes all important stakeholders, from learners to practitioners to lecturers.

Modularity in content development allows the integration of learning opportunities in diverse settings that meet the needs of all learners. In terms of content, this has the advantage that students are introduced to use cases and application scenarios from work-based settings at an early stage. The university perspective in turn makes it possible to incorporate research into the learning opportunities. Modularity enables the development of complex teaching and learning settings that take a more holistic approach. The degree of complexity of a learning opportunity in terms of learning progression and learning goal taxonomy can be controlled more finely granularly by educational institutions and teachers through the modular approach as materials can, for example, be adapted on the individual level, for example, through individual learning pathways based on learning analytics.

Openness – in the sense of using, reusing, and remixing of materials and formats – can serve as a central driver for the establishment of overarching standards. This enables not only the integration of high-quality learning formats from other educational institutions, but also the adaptation to the needs of the respective target groups. Thus, a process of continuous development of learning offers can be established, which is a central pillar of formal quality assurance in the EHEA (ENQA, 2009). Furthermore, the approach of openness and collaboration creates not only cross-comparability of learning achievements in various contexts and programs, but also educational equality though free access for all learners.

The challenges will be to build and strengthen cross-cutting collaboration and networks at a national and European level within the EHEA which incorporate the interests of multiple stakeholders. Within this setting of collaboration, modularization an openness, overarching standardizations and interoperability of digital learning ecosystems can be developed and implemented which can facilitate the recognition of learning achievements in various contexts across borders.

6. Getting into the conversation: Workshop setting, progression and expected outcomes

The workshop will be hosted for up to 20 participants of the I•HE2021 conference. It starts with an introduction of the AI Campus, the speakers and the conceptual preconditions introduced in this paper. It will be followed by a second interactive part, where the participants are asked to discuss the following four guiding questions in separate groups:

- *Which (overarching) standards and frameworks are needed for the creation of modular digital learning opportunities?*
- *Who are important stakeholders which need to be brought together to collaboratively provide learning opportunities and (alternative) credentials based on standards developed?*
- *How can important stakeholders in the EHEA be brought together to implement these overarching standards and make them visible through free accessible learning opportunities?*
- *How to create value and trust in the learning opportunities and the connected (alternative) credentials based on aspects of collaboration and openness?*

Based on the above formulated key questions groups will be defined, based on the participants backgrounds and experiences. In the group setting, participants will be encouraged to contribute by providing examples, best-practices, assumptions, and recommendations. All input will be collected on prepared whiteboards referring to the introduced terms. The principles of collaboration, modularity and openness will be guiding the separate discussions as they are inherent in the key questions. Workshop facilitators will contribute by moderating the discussion and commenting to the experiences made at the AI Campus.

In addition to the guiding questions a number of **indirect questions** could be posed to give the workshop a clearer structure and better refer to individual points of view and backgrounds of the participants:

- To what level is openness supported in your teaching and learning environment, and where do you see the limits to increase the production and distribution of OER?
- If you are involved in the production of learning opportunities: Are you already developing microformats or content and how do you deal with the aspects of recognition of learning achievements?
- What forms of credentials are your offering for microlearning?
- Are alternative credentials already recognized in certain work-based contexts?
- How can a community of practice be established in the EHEA who develop standards, guidelines and frameworks for microlearning and micro-credentials?
- How can a community of practice create content based on formulated standards, guidelines and frameworks to create trustful micro-credentials.

In the third part of the workshop the results of the three group discussions will be presented by a member of each group. All others will be invited to comment and add to these conclusions and to make cross-connections. All contributions will be documented by the participants in short notes which will are summarized and evaluated by the organizers after the workshop. It should lead to a subsequent document, serving to structure the continuous discussion on all key questions.

Objectives and expected outcomes

The workshop is defined in close connection to the approach of AI Campus to become a trusted and effective resource for teaching and learning with the focus on AI for broad and diverse target groups. It follows the need to deal with the complexity and speed that characterizes the evolution of today´s global knowledge – exemplified on the field of Artificial Intelligence – on the one hand and the need for better approved and internationally accepted learning achievements on the other. However, AI Campus only serves as *one* example to initiate a general discussion on interoperable learning ecosystems. Against this backdrop, the scope of the

workshop goes beyond introducing a specific approach. It furthermore asks for the possible generalization and transferability of the experiences in an increasingly diverse and dynamic setting of digital and hybrid learning, target groups and learner´s objectives. This is reflected in the growing number of content related learning platforms and learning eco-systems across Europe (and worldwide). The main goal of the workshop is thus to initiate an exchange on possible approaches and to contribute to the discussion about a next generation of learning eco-systems, sharing the principles of openness, modularity and collaboration and referring to common standards.

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Quality Assurance in Blended and Online Education

An assessment of the quality of French distance education programs

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Abstract
This article deals with the quality assessment of distance learning in French higher education. This assessment comes from the feeling of some students who follow an online program being registered at a university (or at the CNED for some programs called BTS). It's important to point out today what the e-learning is in comparison to what it is not. The COVID crisis and the distance courses realised during it often have given some bad thought about e-learning The important question is about the quality of the live experience of being an online student. The context of our study is that of the "Campus connectés". In their territorial configuration, "Campus connectés" (an initiative of the French Ministry of Higher Education) bring higher education closer to all citizens by creating labelled places that welcome students registered in an online program of a university. They are coordinated by a local public authority. In these places, students benefit from the support of a tutor/coach, an environment that encourages success and socialisation with other students.
To date, we have 44 "campus connectés" in France (there will be 89 by the start of the new academic year in September), with a total of about 400 students in a wide variety of programs. We have designed a survey to

ask them about their feelings about the quality of the programs. We will explain our method and give our main results, which will allow us to identify some ways to improve quality of distance education programs.
Keywords: quality assessment, online education, “campus connectés”

1. Introduction

Distance learning is debated in higher education, and even more since the COVID-19 health crisis. It is a quite old educational practice with postal correspondence courses whose origins go back to the 19th century (Glikman 2014) but which has recently switch to a new paradigm with e-learning. Today, distance learning do implies being alone with only some asynchronous modalities. However, the changing of pedagogical model is certainly not complete. Replacing the paper handouts by some training courses with online PDF documents is not a real innovation. It is not only introducing digital devices that changes the way we teach and the way we learn. Distance learning is indeed at the crossroads of technology and pedagogy according to (Béché and Schneider 2019), but we really have to highlight pedagogical innovations and not only technical or, at best, techno-pedagogical ones.

Having this in mind, we are interested in the life experience of the distance learner. This experience can provide us some issues to address pedagogical outcomes. Our study concern a specific learners: students enrolled in distance learning courses and hosted in places we call “campus connectés”.

First we will present the context of our investigation. We will then present the main results of the study's analysis. Finally, we will try to deduce from this some ideas for the design of distance learning courses that promote student commitment and success.

2. Context

The students we have followed are enrolled for the 2020-2021 academic year in an higher educational online program and have been welcome in a “campus connecté”. These students are potentially 409 spread all over the country. We collected 181 responses, i.e. a response rate of 44.25%.

In comparison to all distance learning students in the French higher education (almost 40000), these students are specific being hosted in a “campus connecté”. The “campus connectés" are places approved by the French Ministry of Higher Education, Research and Innovation especially created to bring a good environment to achieve and success a distance program[1]. Generally located in towns far from major universities and created by local authorities and stakeholders, they provide students with a place near their living place, a time of presence (at least 12 hours per week), a local support, a place for having relationships with other students. In 2019-2020, the population of students in the “campus connectés” was spread over 13 experimental locations with an average age of 28 years (from 18 to 63 years; median 40 years) and the following features: 73% girls and 27% boys, 49% in initial training, 33% in continuing education, 17% returning to study, 46% in a Bachelor's degree, 24% in a BTS and 31% in other training (mainly CNAM, Master's degree and DAEU modules) For the main enrolments in Licence and BTS, we have noted in 2019-2020 a success rate of 90% for BTS students and 55% for Licence students (the 2020-2021 figures are not yet known).

The main added value of a “campus connecté” is the close relation with a tutor. The proposed tutoring is a type of coaching, more than an educational support. It is complementary to the tutoring that institutions that provide distance learning organise to help students acquiring knowledge. Nissen and Soubrié (2011) and Papi

[1] https://www.enseignementsup-recherche.gouv.fr/pid39023/les-lieux-labellises-campus-connecte.html

(2013) contrast horizontal tutoring (by peers) with vertical tutoring (by instructors). The coaching provided on a “campus connecté” is neither horizontal (because the tutors are professionals in the field of learning support, not students themselves) nor vertical (because the tutors are not teachers and do not have the disciplinary knowledge to follow students in all courses). This coaching aims to bring an administrative/methodological support, to develop reflexivity and to maintain motivation and perseverance.

In September 2021, there will be 89 “campus connectés” (Figure 1) opened in France. A “campus connecté” is a small place (no more than 50 or 60 students) in order to guaranty the quality of the tutorial proximity and to provide good support to students who, without the “campus connecté”, might have turned away from higher education. The development objectives of the ministry are not indeed to build an alternative to classical enrolments of students within universities. They are complementary to the universities (for which they promote the distance learning offer) and target a specific public (in the long term, about 5,000 students in all the “campus connectés”, which is extremely small compared to the 2.7 million students in France). For this target the response is to overcome all the type of distance that impact on the student's life: geographical distance, socio-economic distance, distance from social interactions, cultural distance, and distance from the chances of success and opportunities in life. These distances are not systematically opposed to proximity.

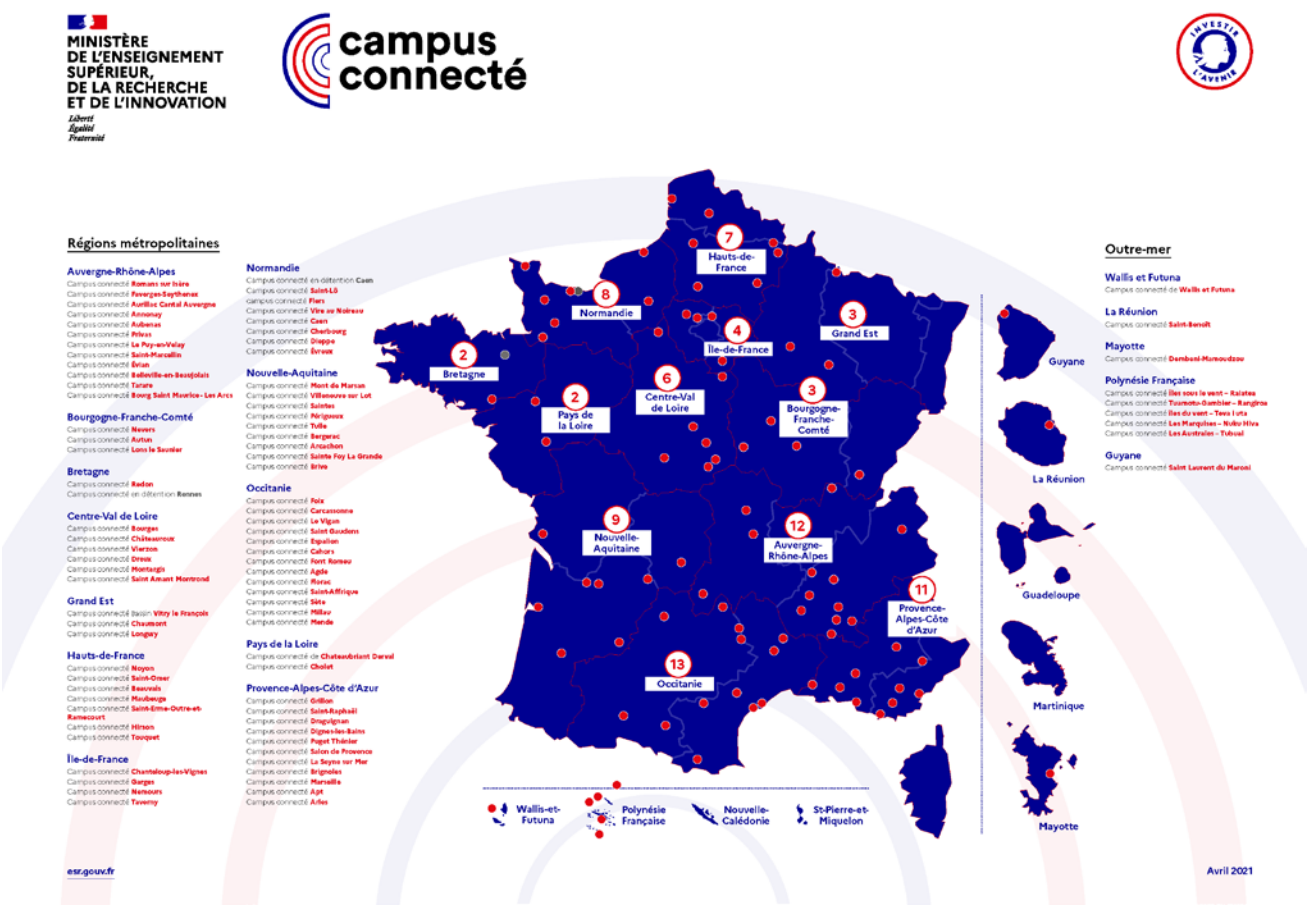

Figure 1: Map of connected campuses (Sept. 2021)

Moreover than the context of the “campus connectés”, our survey has been special because of the year 2020-2021. This year is impacted by the COVID-19 health crisis. Distance learning has been the focus of multiple points of view which are often opposite, some to measure the advantage of distance learning as a mean of pedagogical continuity, some others to argue that the face-to-face teaching would be the only viable

model. This particular year has led to many confusions about what distance learning is and what it is not. The “campus connectés” show that presence and distance are not opposite. There are many ways of combining presence and distance learning. Building a distance learning program with a rich pedagogical scenario made up of synchronous and asynchronous, individual and collective, formative and summative activities cannot be improvised. It has nothing to do with an overnight switch from face-to-face to online activities. Thanks to digital technology and its acculturation in institutions (particularly via their support services), higher education has been able to ensure educational continuity outside the classroom under normal conditions. This is very important in terms of adaptation, agility, including for examination conditions, and guaranteeing the value of diplomas. However, what has been done is not what distance learning should be. Distance learning must be designed as an adapted and chosen response. Adapted, because it uses flexible methods to be compatible with the living conditions of an identified target audience. Chosen, and not rushed through, by the teachers who contribute to it and by the students who follow it.

It is therefore the expectations and conditions of reception that are decisive in understanding what should be distance learning and how we have to take it forward. This is what we have assessed in our study.

3. Answers analysis

Our survey, designed to take between 20 and 30 minutes to complete, consisted of 73 questions under different headings: accessibility, quality of content, teaching aids, learning progress, interactions between students, interactions with teachers or tutors, overall quality assessment.

1.1 Accessibility

For 60.5% of students, the cost of education is between 500 and 1000 euros a year. Almost one in five students (18.6%) pay more than 1000 euros and one in five (20.9%) less than 500 euros. There is therefore a wide disparity in the cost of training, with amounts sometimes varying by a factor of three. Furthermore, it is interesting to note that 46.6% of students indicate that this amount does not seem justified.

The exams (continuous and final tests overall) take place in the enrolment establishment locations (or in the sector high schools for the BTS) in half the cases. There is clearly an effect of the COVID crisis here, as exams are quite rarely conducted on line in normal circumstances. The students interviewed in our study are 75% to express the need for exams to be held remotely. This is understandable, as travelling to take exams in an institution (that is often far away) for 3 exam sessions a year potentially entails significant costs and requires a high level of availability (often opposite with the very reasons for choosing distance learning).

About 44% of the students indicate that it is not possible to attend online synchronous classes, while 70.7% of them believe that it would be useful.

2.1 Quality of content

A very high part of students (93.2%) felt that it was easy to navigate the learning management system (LMS). Similarly, almost 9 out of 10 students (88%) indicate that it is easy to find all courses on the LMS. Finally, 88% indicate that access to courses is available all year round.

As for the possibility of finding the contact details of the persons responsible for each course, 12% indicate that this is not possible and for a third of the students, it is possible for certain courses only.

The objectives of the courses are not systematically indicated at the beginning of the semester (14.3% answered "no" and 22.9% answered "for some") whereas 86% of students say to need this. Regarding to the

assessment methods, 1 student out of 5 indicates that they are not specified, whereas 97% indicate that they need this information.

Concerning the clarity of the information given, a majority of students consider that it could be improved (15.8% point to a general lack of clarity and 46.3% respond for certain courses).

3.1 Teaching aids

Written courses (PDF files) are the very most common type of resource made available on LMS (92.7%). The students would like to have more dynamic and interactive resources than written lectures. They ask some videos and slide shows with voice.

13% of students report several delays in getting courses online and 26% report delays in some courses only.

Almost one in two students (47.2%) regret not having lasts year's assessment papers. Four out of five students (78.5%) indicate that they felt the need for them. When lasts years papers are offered, it appears that in 61.4% of cases, corrections are not available, whereas 9 out of 10 students feel that this would be really useful.

Training exercises are often proposed (almost 2 out of 3 students). In 30.5% of cases, training exercises are only present in certain courses, while more than 8 out of 10 students indicate that they feel the need for them in all courses.

Only 1 out of 3 students say they are informed about the possibility of borrowing books. 94% do not know if mail order loan is possible. Not surprisingly, 2/3 of students report that they do not use the library services available at their institution.

4.1 Learning progress

A very high proportion of students (76.7%) say that a knowledge test at the beginning of the year or semester is generally not proposed. Three quarters (75.9%) feel that it is very useful in each course.

A great part (61.2%) of students report having homework to do. Less than 1 in 10 indicate that they do not have any. Those who do not have homework would like to have, for each course, between 1 and 2 homework assignments a year in 37.9% of cases and between 3 and 4 a year in 37.9% of cases.

57.4% of students do not have any progress meter in their courses. 76.3% feel that it would be useful.

44.1% of students indicate that they do not have a general annual schedule with the dates of enrolment, the beginning of each semester, the holidays, the revision and assessment sessions and the dates of juries for diplomas. 92.4% of them point that this is be useful.

5.1 Interactions between students

About 6 out of 10 students (61.2%) indicated that no gathering time proposed by the enrolment institution during the year. 69.5% say they would appreciate. Most of students (57.6%) would like to have one to two gathering per semester. Nearly a quarter would like to have between 3 and 4 per semester. There is a really need of socialization by gatherings with other students of the same program in addition to the socialization within the "campus connecté".

Three quarters of the students indicate that they do not have any asked group works. This is not a request because almost two thirds (63.9%) of students feel that it would be useless for them.

A very large part of students (89.7%) reveal that a forum exist for students to exchange points of view and topics. Apart from forums, it seems that institutions also offer other communication tools such as Facebook, Whatsapp or Discord. Furthermore, three quarters of students indicate that it is easy to communicate with other students. However, 68.2% indicated that they did not have any interaction with students of the same program and 61.7% indicated that they do not really feel this need.

Finally, 60.5% of students ignore if they have the possibility to link up with an alumni network.

6.1 Interactions with teachers or tutors

Only about 6 out of 10 students report that they can contact all their teachers. In a third of the cases, this is only possible in certain courses. It should be noted that almost 7 out of 10 students feel the need to be able to contact the teacher for each course. Among the preferred tools for exchanging information, e-mail and the forum come out on top.

13.5% of students indicate the average answers time within one day, 47.1% indicate less than 48 hours and nearly a third indicate between 3 and 7 days. On the whole, the answers times seem to be fairly satisfactory, even if there are sometimes major disparities. It would also seem that, on the whole, the answers provided really help students.

Synchronous exchanges between students and teachers are not very common (25.4%). When they exist, they are scheduled fairly regularly (38.3%: once a month; 17%: several times a month; 21.3% several times a semester).

The time to make corrections available varies considerably. They is less than 48 hours in 10.9% of cases, between 8 and 15 days in 22.4% of cases and in 18.4% of cases more than 15 days. A small proportion of students also says that some assignments were not corrected. Especially if formative assessment is used, care should be taken not to have too long a delay. This is a request that students informally make to the tutors who monitor them in their “campus connecté”.

41.3% of students indicate that it is possible to exchange with the reviewing teacher. It seems that this is only possible in some assignments (29.1%) and that it is not possible in almost one out of three cases.

We notice that one student in two said that the date of exams results are not respected. Finally, it seems that in 31.6% of cases it is not possible to discuss exam results with teachers.

The institutions rarely propose a distance quality learning evaluation survey. Only a quarter (21.4%) of institutions offer one.

7.1 Overall quality assessment

When asked student how they would you rate the quality of their distance learning program. 5.7% said they were not satisfied, 33.4% were moderately satisfied, 46.3% were fairly satisfied and finally 14.7% were very satisfied.

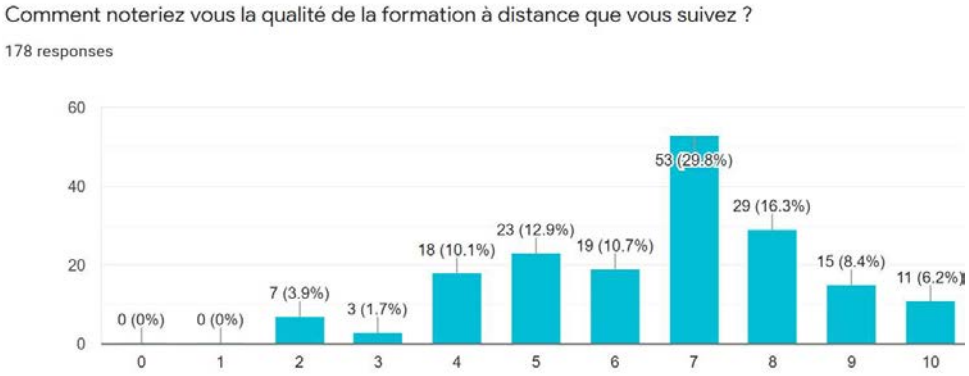

Figure 2: Overall rating (0 least good, 10 best)

4. Summary

The techno-pedagogical systems used in online education have greatly increase learning experience. Students do not feel alone and lost in their training programs. The overall assessment of the quality of the learning experience is quite positive. However, some negative points and requests are highlighted, especially in the open comments of the survey.

Some course materials are not well updated, including in courses with additional fees (this is not a matter of price). Differences in pedagogical design, not necessarily well understood, are indicated between different courses within the same program. The resources are largely textual documents in PDF where students want more voice commented slideshows, videos, podcasting, screencasts to demonstrate software tools. This reflects a techno-pedagogical design still directly inherited from mail training. Interaction needs to be developed. This really calls for synchronous exchange times to facilitate inter-understanding. Negative opinions and requests concerning assessments were frequent, particularly on the question of internships in the 2nd year of the BTS. The need to understand the criteria used in assessments is important. Regarding to exams and homework, there was a strong demand for past years papers and answer keys in order to better understand what was expected in the assessment. Especially for homework, synchronous feedbacks and formative assessment with debriefing by the students are expected.

Finally, there are some requests to personalise the online environments according to the progress of the students and what is expected of them. This is what is expected from learning analytic tools providing student dashboard (and also teacher's dashboards). Learning analytics are not yet widely deployed in the LMS used in French institutions (mostly in Moodle platforms). Inspiring uses can be found in other countries, in particular in Quebec with, for example, the digital study environment of Laval University integrating advanced functionalities for analysing learning traces (see https://www.enseigner.ulaval.ca/ressources-pedagogiques/site-de-cours).

5. Conclusions

To conclude, it seems to us that the appropriation of the uses of digital technology in distance learning programs is underway. In the short to medium term, we can expect a new period of maturity in online distance learning. Fortunately, we are still far away from a glass ceiling of the pedagogical innovation. Some fields of improvement have a strong technological component, such as the deployment of "learning analytics". Others are much more organisational and just as important, as shown for instance by the need for students to benefit both from borrow documentary services and distance learning programs.

A lot of work and funding have been put into the pooling of digital resources, for example with France Université Numérique[2] or the Universités Numériques Thématiques[3]. More generally, the French State invested €265M between 2012 and 2018 (see IGAENR Report No. 2018-49 "Digital educational innovations and the transformation of higher education institutions"[4]) in several investment projects aiming to support institutions in their digital and educational transformations. These investments go hand in hand with supporting students in their life experience as online learners. Among other things, it seems particularly strategic to ensure that teaching periods (sessions, semesters, years) get off to a good start by giving students as much visibility as possible on the times that will mark out their learning. This need is evident from the study we carried out and even more so from the daily interactions that the tutors/coaches on the "campus connectés" have with their students.

Although the student panel in our study is in a favoured position relative to unaccompanied distance learners on a "campus connecté", it seems to us that their experience of studying at a distance is well characterised and not confounded by their experience as accompanied face-to-face students. It is therefore interesting to give feedback to the designers of e-learning programs within institutions. Online training, which is in the process of evolving, needs this feedback, just as it needs to go beyond the strict opposition between distance and presence. Here too, "campus connectés" are demonstrators of successful hybrid training that can arouse curiosity and interest. This is what we are contributing to.

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Artificial Intelligence in Teaching and Learning

Artificial Intelligence in teaching and learning: How the Promised Land can be converted into Hell

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Abstract
Plato regards education as a means to achieve justice, both individual justice, and social justice. In this educational system, there was a great interaction between the student and the teacher. This personal communication has a catalytic and an essential role in the pedagogical relationship. This takes place because through this unique pedagogical relationship, there is a flourishing of the most complete interaction and mutual influence is realized, but at the same time, it is given to the educator the opportunity to influence the values, attitudes, and perceptions of the educated. Of course, we cannot deny that Artificial Intelligence will help students and teachers to learn more to discover new abilities to conquer every kind of knowledge. At the same time, a student knowing their teacher is not human put great strain on a student's ability to empathize and imagine themselves as mastering the content and skills at hand. A computer is a computer. Computers are capable of levels of calculations, which we could only dream of achieving with our minds alone. But when a human teacher can show the benefits to learning content—and indirectly proving not only that it can be done, but that it is something to aspire to—learners are more likely to be inspired to work harder and make progress. In this paper, we are going to analyze the advantages, disadvantages, and dangers of Artificial Intelligence education.

Keywords: Artificial Intelligence, Plato, teacher, student, computer, pedagogical relationship.

1. Introduction: The role of teacher and education in the progress of human civilization

From ancient times, teachers have been playing an important role in any society. Behind every successful engineer, historian, general, or doctor, there is a teacher. He is a person who creates a child to a useful person in the world. The teacher teaches us moral values. He is the person who encourages us and enables us to become better people, to make our dreams true. Alexander III of Macedon (20/21 July 356 BC – 10/11 June 323 BC), commonly known as Alexander the Great, the king of the ancient Greek kingdom of Macedonia used to say for his teacher Aristotle: "I am indebted to my father for living, but to my teacher for living well". If anyone looks up some biographical and historical texts about the life of famous people as generals, politicians, theologians, heroes, scientists, scholars, and many others, he will find phrases which show the necessity and the importance of a good teacher in life of any human being. In all these texts, it is underlined that teacher is a creator of man. He is the foundation, the backbone of the society of all education, and thus of the whole civilization of mankind, present, and future. No nation reconstruction is possible without the active cooperation of the teacher (Saharan & Priyanka, 2019).

The teacher was and is the pillar of education that is fundamental to the development and growth of human civilization. Through the centuries, famous teachers changed the life of people and had a catalytic role in the progress of society. As we referred above one of the most important teachers was Aristotle the teacher of Alexander the Great. Some teachers who changed the world and helped the progress of human civilization were Socrates, Plato, Pythagoras, John Amos Comenius, Anne Sullivan, Maria Montessori, and many others.

Socrates supported that knowledge was a virtue and the teacher can create not only well-educated individuals but can make moral persons. Only when true education was concerned with the common good based upon the rational principle of individual and social justice will be a priceless treasure. For Socrates, Plato's mouthpiece in the dialogue, the education aimed beyond the attainment of virtues, included the greatest and most beneficial study: that of "the good" (Republic 505a). Knowledge of the good is the ultimate virtue; without it, the attainment of other virtues is impossible (Republic 505a). Furthermore, it is insufficient to merely have opinions about what good is. Instead, knowledge of "the good" must be absolute; Socrates says, "When it comes to good things, no one is satisfied with what is opined to be so but each seeks the things that are" (Republic 505d). Only a good teacher can become the light to guide any disciple to the true knowledge of good. Without him, education can provide knowledge without ethics and it can create monsters.

To sum up, the role of a teacher was and remains very important because a good teacher should put his heart into teaching. The great teachers work tirelessly to create a challenging, nurturing environment for their students. Great teaching seems to have less to do with the teacher's knowledge and skills than with his attitude toward his students, his subject, and his work. The question that is revealed concerns, if the work of a teacher can be replaced by a machine. Could Artificial Intelligence do the job of a teacher?

1.1 Technological progress as a helper in the education of people

The education of children and mainly the achievement of the knowledge of human civilization was not something easy during all centuries and through societies. In the beginning, for hundreds of thousands of years, children educated themselves through self-directed play and exploration. A thousand years before Christ, in Mesopotamia, in Egypt, in India, only royal offspring and sons of the rich and professionals such as scribes, physicians, and temple administrators, were schooled. Most boys were taught their father's trade or were apprenticed to learn a trade. Girls were obliged to be brought up without any education. They had to stay at home with their mothers to learn housekeeping and cooking, and to look after the younger children. Education in these civilizations was a privilege only for people in the middle class, of the servants of the temple, and mainly of the upper class. Additionally, the characteristic of education was mainly religious (Marrou, 1982).

Through the centuries, from antiquity to early modern times the education was a gift more for upper-class boys less for girls of these families, and not at all for lower poor class children. Children of rich families were well schooled and were taught by a private tutor at home or went to school. On the opposite hand, the majority of girls and boys of poor families were obliged to remain without education or to learn only reading and writing. Later, the established higher education in universities began as privileged institutions, designed to advance a certain kind of student and exclude others (Bowen, 2003).

Another problem with education was that many schools and universities did not provide full access to the girls. When public schools did open up to girls, they were sometimes taught a different curriculum for boys and had fewer opportunities for secondary or higher education (Rodriguez, 2019). Children with disabilities were often kept at home or put in institutions where they received little or no education. Today, although United Nations Educational, Scientific, and Cultural Organization (UNESCO) underlines the importance of every child having access to education, there are a majority of children that cannot be educated. One of the solutions that can help children to become educated is technological progress. In the educational field, technology yields many benefits. Technology is a

catalytic factor influencing education today. Schools are expected to use technology to enhance the education of their students yet challenges to its use have been identified (Johnson et al. 2016).

Many pessimistic people would say that technology did not change anything from the previous decades. This is an absolute mistake. In so many ways, the digital era has profoundly changed education. For one, technology has greatly expanded access to education. In medieval times, books were rare and only an elite few had access to educational opportunities, as we referred to before. Individuals had to travel to centres of learning to get a higher education. Today, massive amounts of information (books, audio, images, videos) are available at one's fingertips through the Internet, and opportunities for formal learning are available online worldwide through MOOCs, podcasts, traditional online degree programs, and more. Access to learning opportunities today is unprecedented in scope thanks to technology. The latter played and continues to play an essential role to deliver education to the students outside of school. Although many countries deploy remote learning technologies using a combination of TV, Radio, Online, and Mobile platforms for the education of children, there is a quite large percentage of children that cannot have access either to the traditional way of education or to the technological path of education. Despite these kinds of difficulties in education, it is undoubted that today the ultimate goals for helping children to be educated are fulfilled through technology (Volman & Eck, 2001).

The technology provides the ability to more children of this century to be educated than on the previous ones. The advantages of the technology in education are many, we present some of them:

- students are helped to learn better and more,
- individual learning,
- parents can be much more informed and involved in their children's learning process,
- money can be saved,
- students can cooperate with students of another school in their own country or with students of other countries,
- teachers can find materials that they can present to students or sites that can help students practice new material,
- Students can help each other and work together across to better understand the material,
- a teacher can invite a famous scientist, actor, politician to speak to children online,
- many international school cooperations among students can exist.

The use of technology in education should combine teaching and learning; The knowledge should follow the pedagogy. Students should be supported in their learning journey, allowing learners to involve themselves in different types of activities to discover and experience learning by themselves. In this case, the role of the teacher is catalytic. He has to lead children to the correct path of using technology, to have the best result in education. Technology does not help children only to have more ways of learning, but it gives them the ability for learning at home in the period of COVID-19. Lately, the whole world had to face one of the most serious pandemic coronavirus diseases in 2019 (COVID-19). The virus that causes the COVID-19 spread easily among people, and more continues to be discovered over time about how it spread. Many people became ill and many others died. The ongoing coronavirus pandemic has invited government and public health officials to issue lockdowns and stay-at-home orders globally (Winter et al, 2021).

According to Unicef for nearly 77 million children, the pandemic has taken away their classrooms since the beginning of 2020. The result was the education to be changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms. Of course, the main problem was that online education uses technology, but all children cannot have the same reliable internet

access of the same computers to take part in lessons. So technology helps the education of children who do have access to the right technology. Of course, despite the great investments to incorporate technology into education, the pandemic showed that globally neither teachers nor students were prepared to take on the challenge of implementing online or blended learning in schools (Reimers & Schleicher, 2020).

So, there is evidence that learning online can be more effective in several ways. Of course in these circumstances, the use or the rejection of technology in education has to do with poverty, wealth and a suitable environment in which children live. This will be a great topic for another paper in the future.

1.2. The impact of artificial intelligence on human society.

Artificial intelligence (AI) is a wide-ranging branch of computer science concerned with building smart machines capable of performing tasks that typically require human intelligence (LeCun, Bengio & Hinton, 2015). There are many definitions that someone can give to Artificial Intelligence. It can be defined as the developed technology that enables computers and machines to "act" to function intelligently This kind of machine will not only replace human labour, but they will do men's work in a more sufficient and faster way than men. Artificial Intelligence applications are designed to solve complex real-world challenges and to help human society to flourish (LeCun, Bengio & Hinton, 2015). So, it can be said Artificial Intelligence can find solutions to many problems and make easier working processes than it is today.

There are four types of artificial intelligence: i. *Reactive machines*, as the example of the Netflix recommendation engine: "The most basic types of AI systems are purely reactive, and have the ability neither to form memories nor to use past experiences to inform current decisions. Deep Blue, IBM's chess-playing supercomputer, which beat international grandmaster Garry Kasparov in the late 1990s, is the perfect example of this type of machine" (Hintze, 2016, p. 2). ii. *Limited memory* is an example of autonomy or self-driving vehicles. A limited memory machine can retain some information learned from observing previous events or data. It can build knowledge using that memory in conjunction with pre-programmed data. Theory of mind, and self-awareness. iii. *Theory of Mind,* which is the term given by philosophers and psychologists for the ability to predict the actions of self and others (Carruthers and Smith, 1996). So, according to the practice of Theory of Mind in Artificial Intelligence, there will be robots that will learn, combining advanced pattern recognition and they will have social interaction. This type of machine can make decisions as well as a human. iv) *Self-awareness* has to do with machines that have human-level consciousness, they will understand their existence in the world (Chella et al, 2020). At the moment, robots and general machines with self-awareness exist in our fictional imagination but the future is near.

The question that is raised is if humanity needs Artificial Intelligence? Will Artificial intelligence affect human agency? Do people believe that it is going to improve their lives? Will people face more problems using Artificial Intelligence than having more advantages of the positive impacts of the practice of this kind of education to humans? The experts predicted networked artificial intelligence will amplify human effectiveness but also threaten human autonomy, agency and capabilities. They spoke of the wide-ranging possibilities; that computers might match or even exceed human intelligence and capabilities on tasks such as complex decision-making, reasoning and learning, sophisticated analytics and pattern recognition, visual acuity, speech recognition and language translation (Chella et al, 2020).

Digital life is augmenting human capacities and disrupting aeons-old human activities. Code-driven systems have spread to more than half of the world's inhabitants in ambient information and connectivity, offering previously unimagined opportunities and unprecedented threats (Anderson, Rainie & Luchsinger, 2018). Men want to do things with an easier, more effective, faster, without much tiredness and convenient way to finish the task they work on. In this case, Artificial Intelligence is going to help people to have a better

life. By using it, many positive impacts will help the flourishing of the progress of human society, especially in the field of healthcare, agriculture etc. Specially, we can sum up the advantages of the use of Artificial Intelligence in these points:

- Reduction in Human Error related to human fatigue,
- Fast and accurate diagnostics and surgeries with less damage to the body,
- Taking risks instead of Humans, as the exploration of the deepest part of the oceans, iv. Repeating any work quick and accurate without being bored,
- virtual presence in conferences (Anderson, Rainie & Luchsinger, 2018).

Of course, the coin has two sides. Artificial Intelligence does not have only advantages, many disadvantages of it will have appeared in the future and they will put in danger human relations, behaviours and social customs and traditions. The deprivation of the use of Artificial Intelligence will cause great problems to human beings, such as

- laziness because they will do anything or almost anything,
- Loneliness because people will not communicate with other people and personal gathering will no longer be needed for communication,
- high increase of unemployment because the digital device can take over human labour,
- Rich people will save more money because they will not spend on anything or almost anything for salaries. So the gap between the rich and the poor will be widened,
- human beings will become slaves to these kinds of machines (Anderson, Rainie & Luchsinger, 2018; Brundage, 2018).

In a conclusion, it can be said that every new invention will face the prediction of benefits and harms but if its use becomes with great care and thought, the society will have only profits, otherwise the future will be full of darkness according to Stephen Hawking. The latter warned “early in 2014 that the development of full AI could spell the end of the human race. He said that once humans develop AI, it may take off on its own and redesign itself at an ever-increasing rate” (Tai, 2020, p. 342).

1.3.Artificial Intelligence and education. Can Artificial Intelligence replace teachers?

In the previous part of our paper, we presented how important is the role of teachers and education for the improvement of human’s life and the development of civilization. We analysed the importance of technology in education. In this chapter, we are going to analyse if Artificial Intelligence can be proved the promised land or the hell for education and students. Will students be beneficiaries of Artificial Intelligence’s teaching or will they have to face up Cyclops, Kikkones and Laestrygonians? The arguments about the dangers and benefits of Artificial Intelligence in students’ life and learning can be parallized with the allegory of the Cave of the work *Republic* (514a–520a) of the ancient Greek philosopher Plato. In his writing, there is the effect of education (παιδεία) and the lack of it on human beings’ nature. Based on this we will speak about the effect of education as a result of teachers’ attempts and the lack of teachers on students’ life.

As we referred to above, Artificial Intelligence can help students to obtain more knowledge through mathematics, writing, and other subjects. It can enrich the student’s learning and can teach students fundamentals, but so far is not ideal for helping students learn high-order thinking and creativity, something that real-world teachers are still required to facilitate. Students will oblige to have only knowledge without understanding the way of using it. If teachers use Artificial Intelligence in their lessons, they can find more ways to lead students into the path of learning (Holmes, Bialik & Fadel, 2019). Artificial Intelligence can take over tasks like grading, can help students improve learning, and may even be a substitute for real-world

tutoring. Yet Artificial Intelligence could be adapted to many other aspects of teaching as well. AI systems could be programmed to provide expertise, serving as a place for students to ask questions and find information or could even potentially take the place of teachers for very basic course materials (Holmes, Bialik & Fadel, 2019). The question that is raised has to do if Artificial Intelligence can replace a human teacher completely or not. The answer is definely not. Education is not only knowledge and information. A good teacher interacts with his students. In a great teacher's classroom, each person's ideas and opinions are valued. Students feel safe to express their feelings and learn to respect and listen to others. This teacher creates a welcoming learning environment for all students and at the same time, he knows how to teach each student according to the student's personal needs. The mutual respect to each other that a teacher provides a supportive, collaborative environment. In this small community, there are rules to follow and jobs to be done and each student is aware that he or she is an important, integral part of the group. A great teacher lets students know that they can depend not only on him but also on the entire class (Sen, 2019).

Teachers can listen to the problem of their students, can support them. They are trained to recognise if a student has been sexually or emotionally abused. They can give hugs to a child and try to make the student feel safe. If he believes in his student and persuades them for this, the disciples will try to respond to their teacher's expectations for them. If the tutor predicts that his students will manage to succeed and to become the best, this greatly affects their achievement; Generally, a self-fulfilling prophecy gives teachers as much or as little as is expected of their disciples (Hansen, 1998; Barcena, Gil, & Jover, 1993).

An educator can inspire children to and inspires students with his love of learning, his passion for education and the course material. He constantly renews himself as a professional on his quest to provide students with the highest quality of education possible. This teacher has no fear of learning new teaching strategies or incorporating new technologies into lessons and always seems to be the one who is willing to share what he's learned with colleagues (Lyons, 1990).

As someone can summarise the teacher is a very important person not only for the education of a child but to help him or her to develop a healthy personality. Many paedagogical books have underlined the catalytic role of a teacher in the education of children. Christian Church Fathers as John Chrysostom (PG 57, 327; PG 57, 61; PG 60, 35-36; PG 61, 404-406; PG 61, 594; PG 62, 404) support that a good teacher inspires, attracts and persuades his students to express their arguments and embrace apprenticeship.

In all pedagogical books, in many historic stories in the text of Church Fathers, it is easy for someone to find the value of a good teacher for a child's pedagogy and education. These characteristics of a teacher and many others cannot be replaced by any machine of Artificial Intelligence. This kind of machine cannot weep students' tears and boost their selfless. They provide only knowledge without any sign of love and understanding the difficulties of apprenticeship for their disciples. Students and mainly the younger ones will miss the ethic of a teacher and his real love for each of his students. The result will be that students become isolated from people, to conquer a superficial way of knowledge and life. This will be catastrophic for them because students will have the wings to fly in the region of Knowledge but without care and love for them, they will be like Icarus. They would manage to fly but without any limitations, they would fly too close to the sun and causing harm to themselves and others in the process of exploring the heavens of knowledge and conquer the fields of pedagogy.

Children learning with Artificial Intelligence can become aggressive and isolated on their selves. They are going to lose human communication, they may become arrogant, egoists and they will have education but not paideia. Using Artificial Intelligence which will replace the role of a teacher will become very dangerous. Then, children will have the opinion that they will be free but in reality, they will be imprisoned as people in the allegory of Plato's cave. The danger is great. Children will lose the freedom of paradise in

their apprenticeship with a teacher and they will be in hell, making themselves slaves to their ancestors' creatures because they would love and worship the creature instead of the Creator.

2. Conclusions

From the first moment of men's existence on this earth, people understood the necessity of education and teacher for the development and progress of human civilization. A teacher's passion, charisma, warmth, and humour influence the way students experience learning. Teachers inspired people to become very important for example Aristotle and his disciple Alexander or Ann Salivan with her student Helen Keller.

Meanwhile, technology had a catalytic role in the improvement of not only the daily life of people but in education. The latter helped thousands of children to extend their horizons of knowledge, to have the chance to learn more and more without much cost, to attend lessons of famous professors, to watch seminars and to interchange opinions with other students in different cities and villages of their countries or places of all over the world.

Technology has a catalytic role in the education of people and their daily life but soon Artificial Intelligence will influence more and more human societies. People are called to face up to the advantages and disadvantages of Artificial Intelligence. Many scientists underline the danger of the unlimited use of Artificial Intelligence which will make us slaves to robots. It seems like a bad dream, like a terrifying science fiction film.

The crucial question is if Artificial Intelligence can exalt teachers from the education of children. Educators do not teach their disciples only knowledge and information about history, language, sciences, etc. They teach paideia, love, understanding to them. The apprenticeship creates personalities, memories and waves of laughter and this is not something that any machine can not do. Love is the basic good of a real teacher. Love for his students and the knowledge. Artificial Intelligence machines cannot express love because they cannot feel it. Besides that "Teachers have the ability to shape leaders of the future in the best way for society to build positive and inspired future generations and therefore design society, both on a local and global scale. In reality, teachers have the most important job in the world. Those who have an impact on the children of society have the power to change lives. Not just for those children themselves, but for the lives of all" (University of People, 2021).

The danger is enormous. If people try to replace teachers with machines of Artificial Intelligence, soon they sign the catastrophe of human generation. Children will have education but they will not be taught paideia so they will become slaves of the creatures of their ancestors. The promised land will be turned into their Hell. And for one more time man will be exiled from Paradise and he will have to face the results of his arrogant behaviour. In this way, he will create hubris, the overweening presumption that leads a person to disregard the divinely, natural fixed limits on human action in an ordered cosmos. Artificial Intelligence should be used in a very careful way and mainly in the education of children. Otherwise, people will have to face the consequences of their ultimate downfall because of their extreme pride and arrogance to human nature. As Theodore Roosevelt used to say:"To educate a person in the mind but not in morals is to educate a menace to society".

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Abstract - Educational Bots in Higher Education

Artificial intelligence (AI) currently plays a decisive role in the further development of higher education (HE). In addition to adaptive learning environments and approaches such as learning analytics, bot programs are another possibility to use AI in HE (Selwyn, 2019).

Preliminary results of a research and development project will be presented. An Educational Bot for distance learning seminars is developed by researchers from the university in cooperation with an EdTech StartUp. Besides giving support in formal-organizational aspects, the Educational Bot will be used to support students in the processing of tasks and to give feedback.

The aim of the project is to investigate firstly, the basic acceptance of students towards automated tutoring (Holmes & Anastopoulou, 2019), and secondly to what extent the educational setting with educational bot can support students expertise (Hatano & Inagaki, 1984).

The project follows the methodological approach of Design Based Research. In several iterations, technical and didactic requirements for the bot system are coordinated and implemented in a Moodle learning environment (McKenney & Reeves, 2012). The range of capabilities of the bot will be expanded and an additional persona will be added, repeatedly.

The preliminary results of the project show that the acceptance of students towards an Educational Bot is normally distributed. The assessment of advantages and disadvantages ranges from relieving teachers to replacing teachers and neglecting social aspects.

No statement can be made at this point with regard to the Educational Bots' supportive preparation for professional life. However, first results and consequences of the research project will be presented at the conference.

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Staff Support Services in Online and Distance Education

Building digital teaching and learning capabilities in Higher Education in Ireland with the DigitalEd.ie knowledge platform

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Abstract

In 2019, GMIT along with higher education partners IT Sligo and LYIT in Ireland, were awarded a HEA Innovation and Transformation award to build digital capabilities in the Connacht-Ulster Alliance (CUA). The project is called iNOTE and it provides opportunities to transform the higher education experience in the CUA institutes (2019-2022). GMIT Teaching and Learning Office, is leading the development of DigitalEd.ie Knowledge Platform and digital teaching and learning development initiatives (i.e. Work Package 2 of the iNOTE project). DigitalEd.ie, is a digital teaching and learning knowledge platform, that provides access to professional development pathways and a suite of digital resources, to build digital capabilities and pedagogic expertise, so that educators can design, deliver and support flexible and online learning programmes effectively.

This paper will discuss: the development journey of DigitalEd.ie; building a digital education community; designing digital learning pathways; creating a digital resources directory; insights and impact of building digital teaching and learning capabilities during the pandemic; and the creation of a suite of digital education services and resources, that is transforming the higher education learning experience.

The DigitalEd.ie project is linked to an action research study in GMIT, that is informing a best practice model for developing digital teaching and learning capabilities in higher education.

Keywords: Digital Education, Digital Teaching & Learning, Online Teaching, COVID online learning, Student Engagement, Student Success.

1. Introduction

Galway-Mayo Institute of Technology (GMIT) includes five campuses in the West of Ireland with 8,000+ students including 40 nationalities. GMIT is a member of the Connacht-Ulster Alliance (CUA) with IT Sligo and LYIT, and is working towards achieving Technological University (TU) status. The GMIT Strategic Plan 2019-2023 outlines thirteen goals that place the student at the centre of everything we do. Digitalisation and the use of technology are a key strategic priority for GMIT. In 2019, GMIT along with higher education partners IT Sligo and LYIT in Ireland were awarded a HEA Innovation and Transformation award to build digital capabilities in the Connacht-Ulster Alliance (CUA). The project is called iNOTE and it provides opportunities to transform the higher education experience in the CUA institutes (2019-2022).

In March 2020, the physical closure of all five campuses in GMIT, forced everyone online in a hurry and transitioned our learning, teaching and assessment activities to a new platform. The COVID 19 emergency has

fundamentally changed the way we all live and work, and this is having an enormous impact on the teaching and learning experience in GMIT and the wider CUA. The transition has been challenging, but it has also presented a number of opportunities for developing digital capabilities among the teaching community and alternative strategies for student engagement.

Transitioning to online teaching and learning in GMIT was made possible due to a number of factors including: the advances in education technology globally in recent years, and the seamless integration of Microsoft Office 365 suite and Moodle; Connacht Ulster Alliance (CUA) engagement with a HEA funded digital education development project called iNOTE, and the development of https://DigitalEd.ie; the Teaching and Learning Office's digital teaching and learning online support resources and rapid response digital education workshops; a suite of flexible online learning development courses; the flexibility and dedication of the teaching community engaging with digital professional development; and the creation of the BOLT steering group for GMIT during the emergency in 2020.

A range of initiatives established, that are building digital teaching and learning capabilities in GMIT include: *the development of a digital champion team representing each academic department; Ask Me Anything (AMA) clinics; digital teaching and learning small group workshops; a digital education webinar series; alternative assessment strategies workshops; show and tell insight sessions on digital technologies; recruitment of graduate student mentors; online PASS leadership sessions to support the first year experience; the digital education development pathway at DigitalEd.ie for academic staff; digital professional practice alternatives; and investment in a remote teaching technology toolkit, for all staff working remotely.*

To begin, this paper will explore a literature review on teaching and learning challenges during the pandemic, followed by the development story of DigitalEd.ie knowledge platform, feedback from stakeholder engagement and focus groups with the Digital Champion community, the impact of the DigitalEd.ie initiatives to date, and finally the paper will conclude with a discussion on lessons learnt.

2. Literature Review

Reflecting on the response by higher education institutes to the challenges involved in the sudden relocation of teaching, learning and assessment away from the traditional campus environment, is presented in a variety of reports, and this has guided the transition and digital transformation journey in GMIT over the last 12 months. Key national reports include: the QQI (2020); the National Forum for the Enhancement of Teaching and Learning (2020); the USI (2020); GMIT's annual report to the HEA on the iNOTE project (2020 and 2021); a special GMIT Student Opinion Campaign undertaken in partnership with the GMIT Student Union (2020 and 2021); and an open discussion forum with academic and professional services staff in GMIT, to identify the challenges encountered with remote teaching.

Overall, the reports collectively refer to the enormity of what was achieved through dedication, collaboration and innovation in moving teaching, learning and assessment online. In September 2020, an analysis of the COVID higher education reports, reflecting on the learning, teaching and assessment experience, was prepared by GMIT Teaching and Learning Office and the findings were categorised under eleven themes including: *working and studying at home; teaching and learning; assessment; policies and procedures; college experience; digital skills and academic professional development; communications; health and wellbeing; fees and finance;*

resources, supports and access; return to campus. The findings were considered by Academic Council and the Governing Body and have helped pave the way for the next phase of GMIT's digital transformation journey, including managing the COVID-19 remote learning experience.

Within a very short period (i.e. one-two years) many researchers in higher education institutes both nationally and internationally, have also shared their teaching practice experiences during the pandemic. The main objective of higher education practitioners was to allow their students to achieve the learning outcomes and continue their education during the COVID-19 global pandemic. The pandemic was an opportunity to pave the introduction of digital teaching/technology enhanced learning (TEL) and to introduce new assessment strategies and alternative assessment opportunities. The DigitalEd.ie project was a particularly valuable resource for higher education lecturers across the CUA (Connacht Ulster Alliance), in supporting this.

A relevant and recent study, that reinforces the importance and impact of digital education resources and training, was published by UCD (2021) titled, 'Online Learning Experiences of Irish University Students during the COVID-19 Pandemic'. Responding to pandemic and remote teaching challenges that arose in March 2020, this study investigated 132 full-time Business postgraduate students' online learning experience in an Irish University. Findings from both quantitative and qualitative data provide insights into what worked, what did not and why. This study found, that most students still prefer in-class learning, despite some very positive online learning experiences (Yang, 2021). They felt that the social aspect and the learning benefits from face-to-face interaction with instructors and peers are not fully replicable in the online learning environment. The findings suggest that the foundation for an effective online learning experience is engagement. Synchronous delivery happens in real time, this means students and teachers can interact in a live, virtual place and engage in real-time online communication and discussions regardless of location (Snart, 2010 ; Clark and Mayer, 2016). Students spoke highly of the classes, that have interactive activities, which allow them to engage with their instructors and classmates. These activities were commonly associated with live virtual sessions. Where such activities occurred on a regular basis, students felt more connected to their peers and teachers (Yang, 2021).

The findings from the UCD report, correlate well with the GMIT OpinionX student experience study conducted in June 2020 and February 2021. The OpinionX engagement campaign was organised to understand the experiences of GMIT students during remote learning and assessment. The survey engaged 1,253 students accounting for nearly 18% of the total student body. The OpinionX approach, is an 'open-survey/discussion platform' which means that participants not only submit written responses to a question, but they also vote on each other's submissions. This data was used to surface the opinions that best represent the views of the wider population. The study in 2020 and 2021 explored the GMIT student learning experience during the COVID remote learning period and found that lecturers overall have done a good job during the pandemic using interactive and engaging online learning methods such as quizzes, the digital whiteboard and online polls. Students also shared their views on continuous assessments and online exams, noting their preference for online exams rather than the in-person exam hall experience. Overall, 52% agreed with a statement that they have adapted well to online learning and a further 62% agreed with a statement that they were struggling with online learning. This represents the student experience in higher education nationally (USI, 2020), where students shared their struggles with adapting to online learning, while also recognising some of the benefits gained from digital education experiences.

The UCD study also reported on the technology students most enjoy including a digital interactive whiteboard, Microsoft Teams and OneNote (Yang, 2021). The literature reports on three main factors influencing teachers' use of technology including: the experience of other teachers; availability of technology in the classroom; and availability of in-school training (Yang, 2021). There are also challenges to consider, where some teachers lack confidence in using this technology and this can influence their use. The National Literacy Trust (Picton, 2019),

found most teachers supported using technology but cited lack of training as the major barrier. Almost a quarter (23.3%) had no training in using technology in literacy teaching. Research shows that teachers must know how and when to use technology which, when used appropriately, is an important tool in the classroom (Hollebrands, 2020). Teachers' levels of technological skills and capacity to adapt both the quality and quantity of curriculum, are essential for student success.

Furthermore, a relevant study titled 'The Impact of COVID-19 and Emergency Remote Teaching', outlines the impact of these changes to the practitioner's teaching in the discipline of computer science in the UK. This research is based on quantitative and qualitative results from a large-scale survey of the educational workforce (i.e. approx 2,197 respondents). This study was conducted in the months after institutional closures in March 2020 and the shift to online delivery. This research reports on how educators teaching computer science in various UK-settings (214) show significantly more positive attitudes towards the move to online learning, teaching and assessment, than those working in other disciplines. These perceptions were consistent across other schools, colleges and higher education institutions. Practitioners noted the opportunites of these changes for their respective sector, especially a renewed focus on the importance of digital skills (Crick, Knight, Watermeyer, & Goodall, 2020).

3. DigitalEd.ie Knowledge Platform Development Story

In June 2019, the Teaching and Learning Office (TLO) team in GMIT commenced a digital capabilities audit across eight campus sites in the CUA institutes, and this was followed by an audit of digital education tools available through various online platforms. In parallel to this activity, GMIT established a partnership with the State University of New York (SUNY) (a network of 60+ campuses in New York state delivering online programmes), to learn about their online teaching and learning strategies and approaches in building a student support services model for remote and blended learners. Following the review of SUNY teaching and learning resources for the online teaching community, GMIT TLO began to work on the development of a Digital Education knowledge platform, a Digital Champions programme, an online self-directed course on 'how to teach online' and the creation of a level 9, Certificate in Digital Teaching and Learning, aimed at higher education staff.

By October 2019, the national INDEX digital staff and student experience survey launched in Ireland, and this examined the digital experience of staff and students in GMIT and higher education institutes throughout Ireland. This audit and evaluation of digital capabilities in GMIT and CUA partner sites, provided a strong foundation for the design of the DigitalEd.ie knowledge platform (see Figure 1). The TLO planned to launch the Digital Education platform in quarter 2, 2020. However, when COVID-19 broke out in Ireland in March 2020, this quickly accelerated the TLO plans, and the launch was brought forward by several weeks to support the crisis unfolding. In addition, a suite of specialist online clinics and LTA support services emerged to guide teaching teams and students' engagement with remote learning.

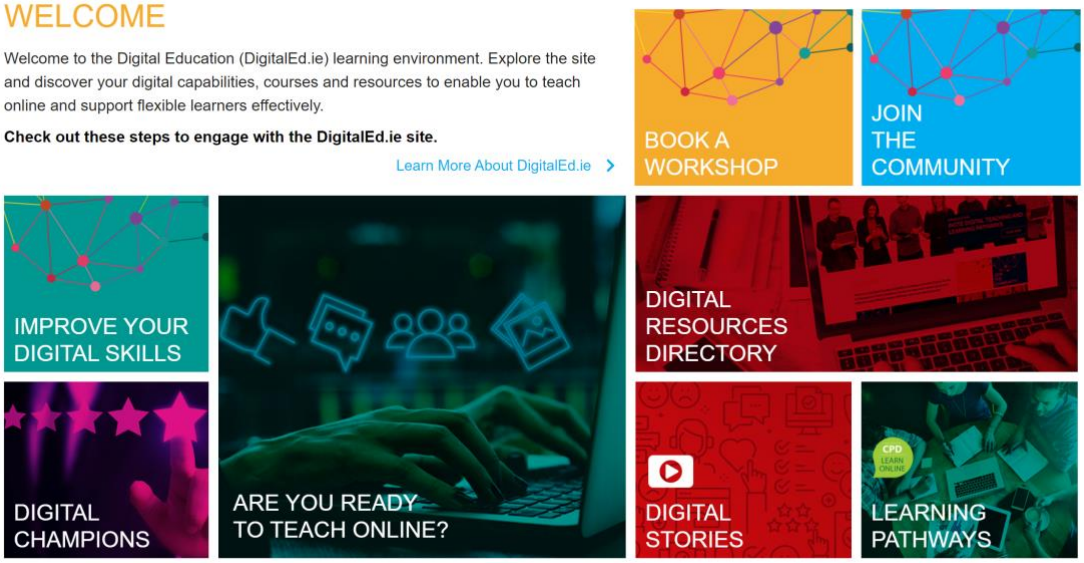


Figure 1: DigitalEd.ie Knowledge Platform

The GMIT Teaching and Learning Office, led out on the design and coordination of a range of rapid response initiatives to support staff and students. This aligned well with the outputs emerging from the DigitalEd.ie Knowledge platform resources and services suite (see Figure 2, Graphic illustration on DigitalEd.ie development). In parallel to this, online sessions were opened up to IT Sligo and LYIT as part of the DigitalEd.ie and iNOTE project.

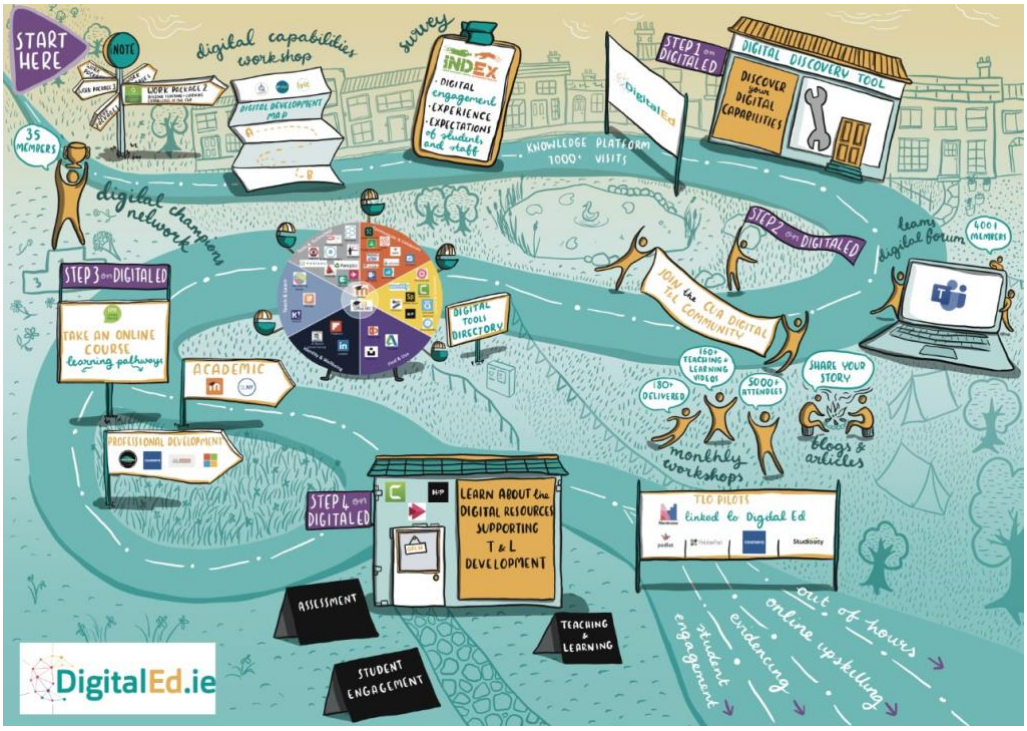


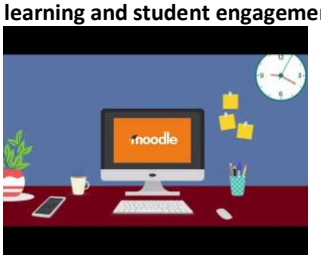
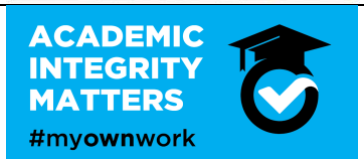
Figure 2: Graphic Story on DigitalEd.ie Developement

During the crisis of March-May 2020, collaborative discipline teams emerged, and a team of Digital Champions supported each other through various online panel sessions, sharing best practice in digital teaching and

remote learning. To further support the digital transformation challenges emerging, GMIT Executive Board {EB) established the Blended and Online Learning Transformation (BOLT) initiative, to provide further COVID-19 rapid response supports, that would impact every functional area in the institute. The BOLT steering group was established in April 2020 to develop a plan for remote learning in the 20-21 academic year commencing in September 2020. The steering group included: A chair, member of the EB; members of various academic departments; academic affairs administration; Teaching and Learning Office; IT Services; and the Student's Union. The rapid response initiatives implemented since March 2020, through BOLT and DigitalEd.ie, that have played an important role in transitioning to teaching, learning and assessment online, are outlined in Table 1 from items 1 to 17.

Table 1: Rapid Response Initiatives implemented in GMIT in response to COVID-19 DigitalEd.ie and BOLT.

Response Initiative	Description	Who benefited?
1. Digital Teaching & Learning Knowledge Platform	A Digital Teaching and Learning education platform (see Figure 2), providing access to digital learning pathways, a discovery tool, digital stories, a digital resources directory, a digital champions network and a digital education forum. The platform can be accessed at https://DigitalEd.ie	Lecturers in GMIT, IT Sligo and LYIT *It is also accessible to the higher education sector under a Creative Commons Attribution-Non-Commercial-Share Alike 4.0 International Licence.* ***9,000+ visitors recorded to date (as at Sept. 2021)***
2. AMA Clinics – Ask Me Anything Clinics	Online One-to-One Clinics with the TLO team of Learning Technologists to troubleshoot online teaching challenges with Moodle, Teams and more and to assist in redesigning of a module or assessment for online delivery.	All Lecturers in GMIT ***400+ AMA clinics to date (as at Sept. 2021)***
3. Graduate Student Mentors	Student mentors to assist the students with online engagement and to follow up where there is lack of engagement.	All Students in each academic Dept. in GMIT **18 Graduate Mentors in place supported by BOLT 2020-2021.**
4. Digital Academic Champions	A programme developed to allow digital champions, who have undertaken formal training in digital teaching and learning to mentor their colleagues in online delivery in each academic department.	All Lecturers in GMIT + 6 Champions established in IT Sligo and LYIT collaborating and sharing practice. **18 Digital Champions in place as a mentor in their academic department since May 2020.**
5. PASS Student Leadership Programme	**Peer Assisted Study Sessions (PASS)** are designed to help first year students cope better with all aspects of life at third level and focus on student integration, engagement, support, empowerment, and leadership to help students quickly adjust to third level life. As a response to COVID, PASS moved to online delivery to include an online PASS Leader Training Programme which included more than 60 student leaders trained to deliver weekly online PASS sessions. A PASS Academic Champion team, mentor PASS Leaders across the institute and first year students promoting engagement with first year PASS study sessions in an online learning environment.	First Year Students **60 student leaders leading weekly timetabled online PASS sessions on MS Teams across GMIT.**
6. Student Hub – Online Portal	From Sept. 2020, GMIT established a central student portal 'one stop online shop' where students can gain access to a variety of student supports and information on studying, online assessments, IT services, campus information, health and wellbeing, student life, finances, student rights and responsibilities, and planning for the future.	All Students in GMIT **Supported by the BOLT initiative serving all students.**
7. GMIT Healthy Campus	A committee of staff and students established since 2019, to promote health and wellbeing throughout the	All Students & Staff in GMIT

	Institute's mission, strategy, policies, plans and practices wherever possible. As a response to COVID, Healthy Campus launched a series of online services and activities that students and staff can avail of to include virtual staff and student choirs, online fitness classes, mental health training programme for staff, online Smart Consent training programme for students, and various online campaigns and promotions addressing healthy eating, physical health, mental health & wellbeing, and sexual health & identity.	
8. Student Success – Online Learning Support Guides	In response to COVID-19 a range of resources were developed by TLO to support students learning online, and include: A short animation explaining the **steps to success in online learning and student engagement in GMIT.**  A short guide for students is also available at this link covering steps to success and some practical advice for GMIT students learning online during COVID-19 (published in March 2020).	All Students in GMIT
9. GMIT's Digital Learning Charter	**GMIT's Digital Learning Charter** outlines our mutual responsibilities and provides a framework for managing our communication and behaviour in a digital world. It should be taken as a statement of our shared values rather than as a rule book. It illustrates the way in which members of GMIT staff and students should work collaboratively so that everyone can benefit. GMIT will aim to support all our learning community to engage in a safe and responsible manner when engaging in digital learning. GMIT Digital Charter is available at this link GMIT Digital Communication Principles animation video is available here. **GMIT Digital Communication Principles** 	All GMIT staff and Students **Supported by the BOLT Initiative.**
10. Academic Integrity, GMIT Student Guide	 Student Guide to Academic Integrity in GMIT is available at this public link and here on the Student Hub	All GMIT Students and Staff
11. GMIT Library Online	**The Library developed an online library support service for flexible online learners:** • LiveChat implemented since April 2020 • Help FAQs implemented since April available 24/7 • Communication via generic library email: library@gmit.ie • Regular online newsletters Note: The online services are staffed by all library staff across four campuses.	All GMIT Students and Staff

12. Remote Teaching Technology Toolkit	Each member of the academic and professional services community in GMIT was supported through the BOLT initiative with a technology toolkit to enable online teaching and remote working and student engagement.	All GMIT Staff **Supported by the BOLT Initiative.**
13. Online Labs/Practicals access via elabs Eiricom	GMIT have investigated and implemented a solution across all our campuses where our physical laboratories including 55 labs to date and incorporating 1140 PC's are **available for online and remote delivery of teaching and learning through the Eiricom Connect Software platform.** https://elabs.gmit.ie/EricomXml/index.html	All students partaking in lab based practicals – allowed students to access computer labs remotely. **Supported by the BOLT Initiative.**
14. Return to Campus Group	A Committee was established to manage the safe reopening of GMIT to include communicating updates with regard the planning for the next academic year to all staff and students, implementing the 3 Step Process prior to returning to campus, and other works (e.g., extra cleaning, installation of extra hand washing stations, completing risk assessment of each area, modifying some workspaces, signage). The aim is to have a safe working environment for staff and students and to keep GMIT COVID-free.	All GMIT Students and Staff **Supported by the BOLT Initiative.**
15. Online Proctoring Project	In 2019-2020 a pilot of online proctoring with PROCTOREXAM (EU company) took place in GMIT School of Business in collaboration with the TLO. The outputs from this pilot were presented in an experience report and case study and this led the way for the Exams Office in GMIT to establish rapid response solutions to high stakes online assessments/exams during COVID-19	GMIT School of Business in 2019/20 and wider impact rolled out in 2020/21 for GMIT high stakes assessments. **Supported by the DigitalEd.ie project and the BOLT Initiative.**
16. First Year Student Induction Course	Developed by TLO and Student Services, GMIT Students completing this course become familiar with GMIT expectations: **who we are; what we do; and how we can help you throughout your time in college.** This course can be accessed here.	First Year GMIT Students **Supported by the BOLT Initiative.**
17. IT Skills Course for GMIT Students	Developed by IT Services, GMIT students successfully completing this course have the **IT skills required to fully engage with distance education in GMIT over the academic year**. The IT Skills course can be accessed here.	All GMIT Students **Supported by the BOLT Initiative.**

4. Feedback from Stakeholder Engagement

By December 2020, the impact on staff engagement and the development of digital capabilities was wide ranging (see Section 5, Impact of DigitalEd.ie initiatives).

In addition, Figure 3 and Table 2 presents overall staff feedback on clinics/webinars provided and how they benefited from the engagement. The majority either agreed or strongly agreed that sessions positively enhanced their knowledge and skills and increased their confidence levels in their ability to teach online or use technology more effectively.

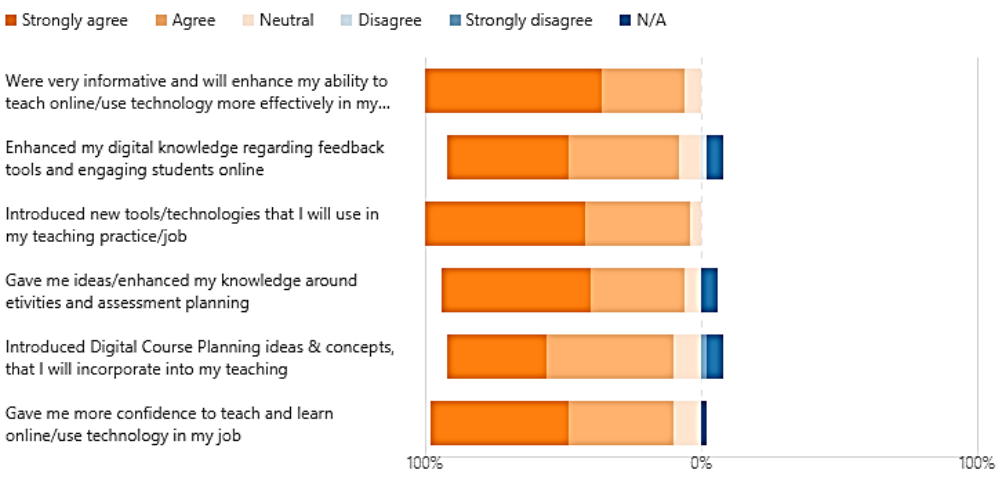


Figure 3: Benefits to attending the DigitalEd development sessions

Further comments are presented in Table 2. The commentary is categorised under the common teaching and learning themes that emerged from the feedback obtained.

Table 2: Feedback commentary and related teaching and learning theme

Teaching and Learning Theme	Commentary
Student Engagement	*"…great variety…atmosphere was very positive and supportive. Some had breakout groups which was great to meet colleagues and discuss…"* *"It was great to get an opportunity to meet other colleagues online and to share their resources and skills. A lot of ideas and tips were also added to the forum and links shared to extra resources was great too. Having the sessions recorded was a positive so the videos are there to go back over…"*
Active Learning Techniques	*"…very well presented and knew the content and how to apply it across disciplines. Also, the opportunity to practise the methods e.g., planning blended learning for modules and spend some time with the technology…Having advice on hand and shared experiences from staff was really useful in getting ideas of how you could apply the methods and technology"*
Peer Learning	*"…highly informative and everyone was very engaged and supportive. I like that nobody felt silly asking the simplest of questions and I hope GMIT continues to host these during 2020/2021 as they are needed"* *"Very good Teaching and Learning Q&A clinics and saved resources provided for follow-up…one-to-one advice would be most welcome heading into Sept 2020 in adapting what we've learned to our modules and individual practices."*
Online Learning	*"…remote access was very convenient and excellent. Content was engaging and input from colleagues highlighted the relevance and application of many elements of the technology to teaching. I felt empowered to engage with online learning technologies in the future"*
CPD Level Communications	*"…well-organised, informative and relevant webinars…there may be value in providing an indication of the level at which each webinar is 'pitched' e.g., level 1, beginner, etc. This might prevent those of us who are just about keeping our heads above water in the digital 'ocean', from that sinking feeling".*
	"even though the courses were fantastic, I found it a bit overwhelming with all the information coming at me from all sides every day. I really wanted to

COVID impact on time and teaching practice	*complete all the programs as they became available, but it was an impossible task with everything else that was taking place at the same time; student needs, school meeting; Team meeting etc…"*
Supportive Online Learning Community	*"Great to be able to partake of sessions via webinar and to have sessions recorded. Very easy to sign up for sessions, presenters were really good…. created a very good sense of community and goodwill. Even by taking a course that was deemed introductory or basic I learned so much. Leads me to believe there is nothing basic. We all learn something."*
Value of CPD in Teaching and Learning	*"…fantastic to have had the opportunity to uptake so many valuable training sessions. I learned something from each one and really appreciated all the guidance on where to find your level in all this. Also, the obvious sense of community support really felt good! I truly don't know how it was pulled together so quickly…"*

In addition, a focus group has taken place with the CUA Digital Champion community (December 2020) exploring the value and impact of the DigitalEd.ie knowledge platform. The focus group session also explored areas for enhancing DigitalEd.ie and the training and mentoring supports provided during the COVID-19 online teaching emergency.

Under the theme of staff support, 'DigitalEd Show and Tell/Showcase' sessions were welcomed, particularly when themed under topics such as 'technology based assessments' or 'student engagement strategies'. Champions noted, "sometimes a live session is needed more than a demonstration recorded video. Colleagues enjoy asking questions and experiencing the live show and tell". In addition, focus group participants (n=10) also outlined the need to have resources which take into account and promote principals such as Universal Design for Learning (UDL), promotion of engagement through technology and even how assessments are designed online:

> *"That extends even beyond the whole digital platform. Even in terms of UDL and you know there's people doing really good stuff, but you only find out about it through networking or media sources"*

Finally, the participants, highlighted a strong preference for an informal workshop in which people share their experience of implementing a certain digital tool or even their teaching practices which have a type of principle which underpin them i.e. Universal Design for Learning, Student-Centred learning:

> *"For the last year and a half we would meet up over coffee (now online, previously in person) and it would be very informal with staff speaking for five minutes about their area and what worked well for them from an online perspective and what technologies they've used"*

Another example from another participant who outlined the similar approach taken on their campus:

> *"About once a month with the use of breakout rooms we would have a breakout room for example: business, another for science, engineering etc. where a couple of people could join each group depending on how many people attend and share teaching practice ideas".*

A word cloud presented in Figure 4, highlights the key discussion themes and topics explored during the focus group session and how Digital Champions play a key role in the ongoing enhancements to the DigitalEd.ie knowledge platform and associated services and resources.

Figure 4: Key discussion topics and themes explored in the Digital Champion focus group (December, 2020).

5. Impact of DigitalEd.ie Initiatives

Through dedication, collaboration, and innovation, GMIT and the wider CUA transitioned teaching, learning and assessment online smoothly. The scale of what was achieved and its alignment to digital transformation strategic objectives, has the potential for transfer of learnings to other higher education institutes in Ireland and internationally.

By June 2021 the impact on staff engagement and the development of digital capabilities was wide ranging and included:

- 300+ Ask Me Anything (AMA) Clinics delivered to academic staff covering digital learning and teaching skills.
- 200+ webinars/workshops delivered online on digital T&L development strategies.
- 7,000+ CUA member registrations across the webinar series
- 100+ teaching and learning office video demonstration video resources produced and available on the TLO channel.
- 50+ Learning, Teaching and Assessment resources/special guides developed.
- 30 GMIT staff completed an accredited level 9, learning pathway in Technology Enhanced Learning or Digital Teaching and Learning, and 18 graduates became Digital Academic Champions, providing one to one and small group mentoring sessions in their academic departments.
- A further 15+ staff across the CUA signed up in June 2021, for the Digital Teaching and Learning (DTL), L9 (10 ECTS) module award.
- 9,000+ visits have been recorded to the DigitalEd.ie knowledge platform enabling self-directed learning and a range of digital education resources. The DigitalEd.ie platform was widely promoted on social media during the COVID-19 emergency, and as a result further higher education institutes have accessed the platform for support and guidance.
- 10 specialist student remote learning support resources and services have been established to help student's engagement with online learning.

- A one-stop shop (online portal) was set up for students called the 'GMIT Student Hub'. There have been 779,339 visits to the Hub since launching in September 2020. The more popular areas of the hub include *Study Skills, Exams/Online Assessment Guides and My IT.*
- 18 student graduates were recruited in August 2020, to provide mentoring and support to students from first year to final year, and create an online sense of belonging to GMIT.
- Top digital T&L topics where academic colleagues sought support and guidance from T&L rapid response clinics and workshops include: *Assessment Design and Set-up; Moodle; H5P; MS Lens; Breakout Rooms; MS Stream; OneNote; Learning Design Strategies; Class Management; Structuring and Online Lecture; Creating Video; TEL tools; Gradebook; online whiteboard; student engagement strategies.*

6. Conclusion

Extraordinary goodwill was demonstrated by those who teach, learn, support and lead in GMIT, and much was learned for the future in our digital transformation development journey. A cycle of continuous improvement in digital education is ongoing in GMIT, through action research studies underway on the initiatives outlined in this paper, and from reflective evidence generated from a wide range of stakeholders. This is critical to our digital transformation journey, which is current today, but it will also be crucial in the post-COVID-19 context, in which the use of blended and online learning is only expected to increase in GMIT and across the higher education sector globally.

Key learnings from the journey to date include:

- Undertaking the digital capabilities audit and evaluation in June 2019, proved invaluable to designing a platform for digital education to support higher education staff.
- Creating a suite of Learning, Teaching and Assessment (LTA) resources for managing the online learning environment, provided much needed support to fill the gaps of knowledge with regards teaching and assessing online.
- Conducting open clinics and discussion forums with colleagues and gaining feedback on where they needed the most help, informed the development of various guides.
- Establishing the BOLT steering group, representing a wide range of disciplines and functional areas in GMIT, resulted in the rapid rollout of a range of supports for staff and students.
- Creating a Digital Champions team co-ordinated by TLO, provided representation across every discipline and 'a mentor' to help navigate the challenges with moving online across 14 academic departments. The network is proving invaluable and has resulted in GMIT gaining a wider reach and increased engagement in building digital capabilities and developing alternative assessment approaches.
- Feedback from colleagues through various studies in 2020 have provided evidence on the value of 'LTA Showcase Events and Forums', where lecturers show and tell what is working well and what is not working well. This peer learning, collaborative forum facilitated by TLO, has proved to be a supportive and collegial network and has helped build confidence among the academic community in teaching and assessing in the online learning environment.
- Recruitment of a team of graduate student mentors has been a great success and each Head of Department (HoD), the teaching teams and the students have benefited from their involvement. Graduate student mentors have played a key role in creating a sense of belonging and retaining students in the online campus. They acted as 'trouble shooters' working with HoD's and student groups from first year to final year.

- Providing for self-directed and directed accredited digital teaching development courses provided 'choice' and 'options' for colleagues and enabled lecturers to engage with learning over the summer months (see Figure 5 & 6).
- Providing for a monthly TLO timetable of workshops and drop-in clinics (140+ workshops and 150-+ AMA clinics to date) has been warmly received by the academic community, and this has led to the development of a 'TLO services module design model' that provides support from concept, right through to the build, design, and implementation stage (see Figure 7).

Figure 5: Self-Directed Digital Development Pathway

Figure 6: Accredited Digital Development Pathway

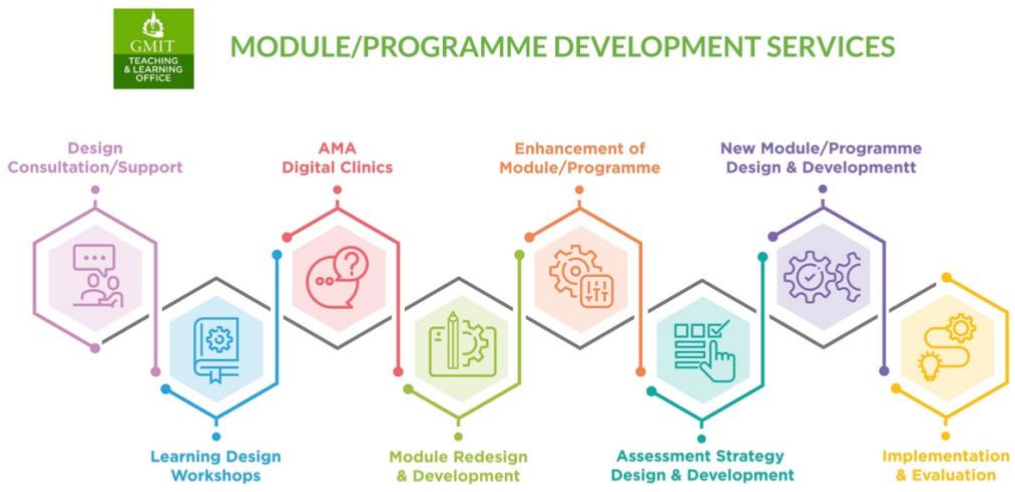


Figure 7: TLO Module/Programme Development Services

To conclude, the DigitalEd.ie knowledge platform and associated COVID remote teaching and learning services implemented in GMIT and across the CUA between 2020-21, has accelerated the rate of teacher engagement with digital education and technology enhanced learning tools. As a result of staff upskilling in digital education, students have also benefited from this, through the range of digital engagement and learning tools (i.e., live class discussions, group work, group discussions, polls, quizzes, icebreakers, presentations, clinics, and social activities), that they have been exposed to, and all of this will support them in further education, employability and the world of work.

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Staff Support services and Digital Education in Nigeria: A Survey of Selected School Teachers in Abuja.

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Abstract:
The Covid-19 pandemic brought the world to a standstill with social restrictions and major changes in our learning environments. This paradigm shift in learning was a drastic step away from traditional in-person learning and an adjustment to innovative on-line learning to suit the times. This was no different in Nigeria as schools and other social institutions were shut down for the better part of the year 2020, and education was moved to the virtual classroom. In Nigeria, necessary resources for online education like access to the internet and computers is still a major challenge all over the country. Despite the lack of infrastructure at the disposal of Nigerian teachers for innovative learning, they were still mandated to carry out their lessons during this period.
This research is qualitative in nature and will involve a survey carried out among teachers in Abuja given the quality of schools in this region which by standard and operations should be better than most schools in Nigeria. This research will discuss the support that teachers got during the pandemic, if any, and how much they were affected considering the economic situation in Nigeria. This paper will reflect on ways to prepare Nigeria and other developing countries for pandemics that could affect our education systems given the new variants of the COVID-19 and how unpredictable our environment has become and how Nigerian teachers can be supported to ensure that education in this region is sustainable. This paper will be a call for the evolution of the new learning space in Nigeria to enable teachers and students adapt to the new learning culture.
Keywords*: Innovative learning, Covid-19 pandemic, digital education, Nigerian teachers, staff support, resources*.

Introduction:
A major significant change prompted by the COVID 19 pandemic was the restructuring of the world's social system as face-to-face interactions and communications became censored and restricted. All social institutions with reference to education, became obligated to adopt alternative and effective mode of learning (Quadir & Zhou, 2021). A bulletin published by the World Health Organization (WHO) in April 2020 after carefully monitoring the characteristics and mode of transmission of the Covid-Sars 2, recommended strategics to limit its spread which included ensuring that human-to-human transmission was avoided by limiting the interaction among close contacts. Kulikowski, Przytula & Sulkowski (2021) opined that the pandemic necessitated educational institutions to move from the conventional face-to-face learning to distant such as distance learning and digital learning due to mandated safety regulations to protect both educators and learners from exposure to the virus.

Nigerian educational institutions have embraced digital learning and have introduced computer application courses in the curriculum for the learners especially in the tertiary institutions, but a large number of students cannot in practice optimally use these computer facilities (Owolabi, Oyewole & Oke, 2013). Poor infrastructure and mismanagement of educational funds and resources are also major challenge to education in Nigeria (Oyediran, et al. 2020). However, the sudden switch from the traditional face-to-face method of teaching in Nigeria to the virtual classroom brought to light more challenges from non-educational sectors of the economy. Unemployment, life, and job insecurities became more apparent with the economic meltdown, and issues such as the cost and inaccessibility of sufficient internet connection and devices affected jobs all over the country, including education and the need to carry out lessons virtually. Electricity has been a major challenge in Nigeria till and statistics by Central Intelligence Agency (CIA) World Factbook (2016), in Agbeboaye, Akpojedje & Ogbe (2019) shows that only about 45% of Nigerians have access to electricity which is very irregular. The failure of the energy and electricity production and supply in Nigeria has been attributed to a couple of factors. Agbeboaye, et. al. (2019) expressly discussed failed government policies as regards to energy in Nigeria. Government policies that encouraged unnecessary extension of distribution lines, chaotic and unappropriated connections of service cables, distorted phase loading, neutral failure, nonchalance towards the repairs and replacement of electricity equipment that more often than not are overloaded, and lastly the inapt sitting of transformers, has led to excessive power loss in the energy network. Failure to properly manage energy in Nigeria has ensured that the country joined categories with the least energy per-capital in the world, according to the World Bank statistics of 2014 and World Population Review of 2021 on energy consumption. Given the state of the power sector in Nigeria, it does not bear saying the impact this has on the economic growth and development of any nation and economy.

Obuekwe & Eze (2017) expressed concerns about the limited and lack of access to internet connectivity in developing countries like Nigeria, affecting the smooth progression of digital learning even in the tertiary institutions. The Telecommunication Networks in Nigeria as well as other sectors of the economy, has majorly been affected by the poor energy supply in Nigeria adversely resulting to a steady increase in operating and capital expenditures, and slow pace in the advancement in technology. Having to operate in these conditions have resulted to very poor network services and very expensive bills for consumers who subscribe for data barely enough to have classes online or use the pay-as-you-surf Cyber cafes. These network services are not accessible to most interior parts of Nigeria given the high cost of installing and maintaining service equipment.

Digital Education in Nigeria:

Digital education or learning can be seen as the use of ICT devices and other modern telecommunication equipment for learning, bridging the constraint of time and space (Oyediran et al. 2020). Digital education in Nigeria began with the first revision of the national policy on education to accommodate modern teaching and learning methods,

without any implementation strategies. Further revision of the policy encouraged the adoption of ICT equipment for state examinations by the National Examination Council, and the effort to provide some schools with computers and related gadgets (Akeem & Sun, 2018).

However, a functional digital educational program in Nigeria has been very difficult to achieve and maintain, due to poor allocations for library and classroom facilities, especially in the government owned and regulated schools. Distance learning has posed a great challenge for educators (Okopi, Odeyemi & Adesina, 2015). Obododike & Okekeokosisi (2020) opined that despite the immense benefit of digital education, the budgetary allocation to education in Nigeria is very low compared to the stipulated fraction by UNESCO. This poor budget for education will not allow for the upgrade of equipment required to carry out digital learning of any sort in Nigerian schools, but rather generate limitations for institutions trying to embrace it. Very few private schools have been able to purchase and maintain online learning equipment sufficient for the population of students and teachers under its management. That notwithstanding, teachers were all mandated to take part in the distance learning.

The concept of digital divide is discussed by Azubuike, Adegboye & Quadri (2021) to understand the inequalities in access to and use of technological equipment due to sociodemographic and socioeconomic indicators, amongst which income is the most relevant to this work. The authors opined that these indicators have sectionalized the society to the “haves” and “have nots”, with Nigerian teachers belonging to the latter due to the salary structure for teachers in Nigeria which requires immediate attention (Kontagora, Wattsa & Allsopa, 2018), as a major challenge till presently.

Teacher Wellbeing

A lot of attention is paid to the wellbeing of the students in and outside the classroom, but very little consideration is given to the wellbeing of teachers and its consequences on curriculum planning, practices, and outcome (Thorburn, 2015). Teachers’ wellbeing as used in this work has been defined by Granziera, Collie & Martin (2020) as the evaluation of the healthy functioning of teachers in their work environment, which is reflected in their job satisfaction, productivity, and output. The OECD report (2020) classified teachers’ wellbeing in three categories; the situated wellbeing which could be found within the classroom or learning environment, the professional wellbeing that entails expectations and standards placed by the profession, and the person wellbeing which involves all family and social life. To achieve high levels of job satisfaction and productivity, the wellbeing of teachers must be considered (Dabrowski, 2020). According to Dabrowski (2020), achieving learning outcome and the teacher’s wellbeing can be said to proportionately influence each other, yet this issue is overlooked resulting to teachers who leave the teaching profession due to stress. Teachers often work in environments that are unfavorable to their welfare, experience the most burnout than most professions leaving them with a feeling of exhaustion, isolation, and powerlessness (Falecki & Mann, 2021). The teaching profession is lacking in empathy and

support, which could negatively affect the academic performance of students without any intervention.

Additionally, Kontagora, et al. (2018) opines that teacher management level in Nigeria is very low, providing no motivation for teachers. The teaching profession in Nigeria is marred by very low wages which are paid irregularly, high student-teacher ratio, limited career advancement opportunities, and very poor working conditions. The demands on teachers are high and continues to grow given the dynamic nature of the human society, and oftentimes have to go beyond their job description to develop the learners. Rather than concentrating all support and attention on the students, the mental state of teachers should equally receive attention as this does not only affect the quality of teaching, but also the future of the teaching profession as a whole. The success of every educational institution rest on the quality of teachers leading the process, and if these teachers are not physically and mentally sound to carry out their duties, the institutions lack the quality of learning they owe the learners and society (Falecki & Mann, 2021). OECD (2020) documented that the outcome of teachers' wellbeing will affect their commitment to the profession, and the quality of learning environment they provide, which ultimately leads to students' wellbeing.

A consideration of Job Demand-Resource theory shows it to be best suited to get a general conception of wellbeing as regards to teaching. This theory according to Bakker & de Vries (2020) and Bakker & Demerouti (2018), can be used to understand jobs with high demands with limited access to resources to meet the demands, which will ultimately lead to the burnout of the job personnel. Workers are demanded to invest both physical and psychological efforts, and such exertions will incur some cost on the individual, while resources are the elements that enable the workers to get the work done (Granziera, Collie & Martin, 2020). This theory highlights the need for overseeing bodies to continuously observe and effectively guide the venture, and in this case oversee the school system to be favorable to both teachers and students. Realistic goals should be set with adequate materials to meet them (Bakker & de Vries, 2020). Teachers are constantly required to improvise learning materials which shows innovative skills; however, some materials and equipment that are capital intensive will require institutional input to ensure a smooth teaching and learning experience.

Objectives of the Study:

Teaching in an online environment needs the use of specific tools, and the insufficient provision of these resources undermining the efforts of the teacher to carry out a lesson successfully. The objective of this study is to investigate the prevailing condition of teachers carrying out digital learning in Nigeria, and the support they received during the pandemic. The study is specifically concerned with the financial support, salary situations, energy, and the availability of computer and related internet resources like data and internet services accessible to teachers in Nigeria for a successful digital learning.

Statement of the Problem:

The schools in Nigeria like in other places were necessitated to adopt the digital education fully given the restrictions passed as a result of the COVID-19. During this period which basically consisted of two school terms in Nigeria, was a challenging period for teachers given the energy and data services in the country. This study will try to show that the support made available for teachers during this period, given that the same output was expected as with the face-to-face classroom learning, was less than satisfactory or motivational for teachers.

Research Questions:
The following research questions are posed to guide this study:

1. How sustainable is the teaching profession in the face of a pandemic in Nigeria?
2. To what extent did the pandemic affect the lives of teachers and their ability to teach online during the pandemic?

Limitation of the Study:
A major limitation faced in carrying out this study is the reluctance of Nigerian teachers to participate in any survey. This challenge is not only exclusive to the teachers but also the rest of the population, who would likely consider how much of their data bundle will be put into filling out a questionnaire, given the cost of subscribing for data bundles in Nigeria.

Research Method:
This study adopts a qualitative research method, carry out a survey using a self-designed questionnaire created in the Google forms platform. The questionnaire is titled “Digital Education and Covid-19 impact on Nigerian teachers” and is structured in two forms. The first section provided options; Yes and No, (Maybe), percentages (%), and lastly checking more or less than specified percentages. The second section has two questions allowing the respondents to freely write their answers. Altogether, the questionnaire is made up of 11 questions that investigated the working conditions of teachers within the duration of the online learning necessitated by the COVID-19 pandemic. The sample of 24 teachers from high schools in Abuja city of Nigeria consented to participate in the survey. The validity of the instrument used was obtained from face value by experts.

Results:

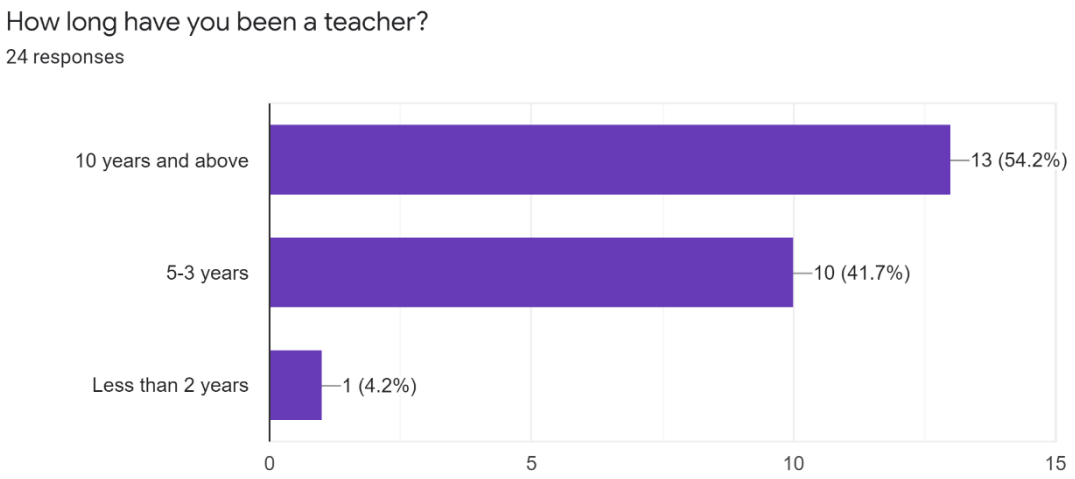

Chart 1: Teaching Experience

To the question about their teaching experiences, 23 teachers out of the 24 that participated in the survey had between 3-10 years job experience before the pandemic. Some of them lost their jobs during the pandemic and before that, 21 of them had their salaries slashed.

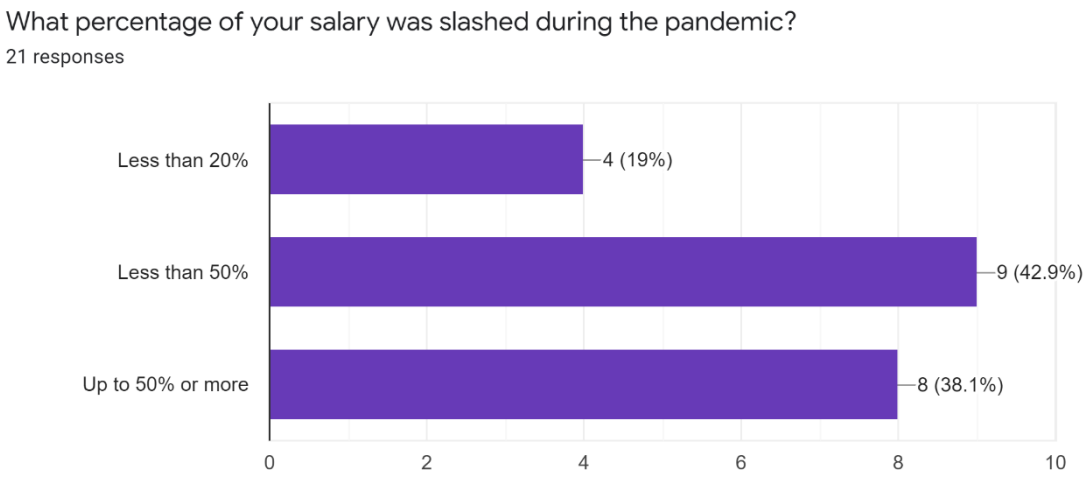

Chart 2: Percentage of salaries slashed during the pandemic

When asked about the percentage of salary slashed during the pandemic, 21 teachers responded to the question of the percentage of their salaries were slashed during this period, and 22 of these teachers participated in digital learning. 50% of these participants spent up to 30% of the slashed income received during this period to carry out the online learning as shown in the chart below.

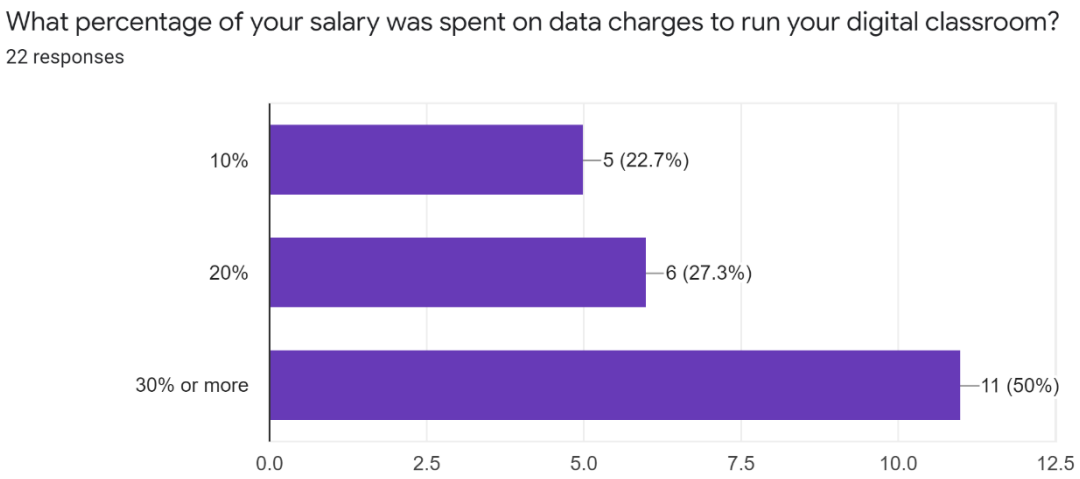

Chart 3: Percentage of teachers' salaries spent on running a digital classroom

When asked of the percentage of their salary that was used to run their classes online, 22 of the respondents used above 10% of their income, and 14 teachers out of the respondents had wards who were students and required as much part of that income to participate in their online classes. The number of children or wards each of them had to carter for, is indicated in the chart below.

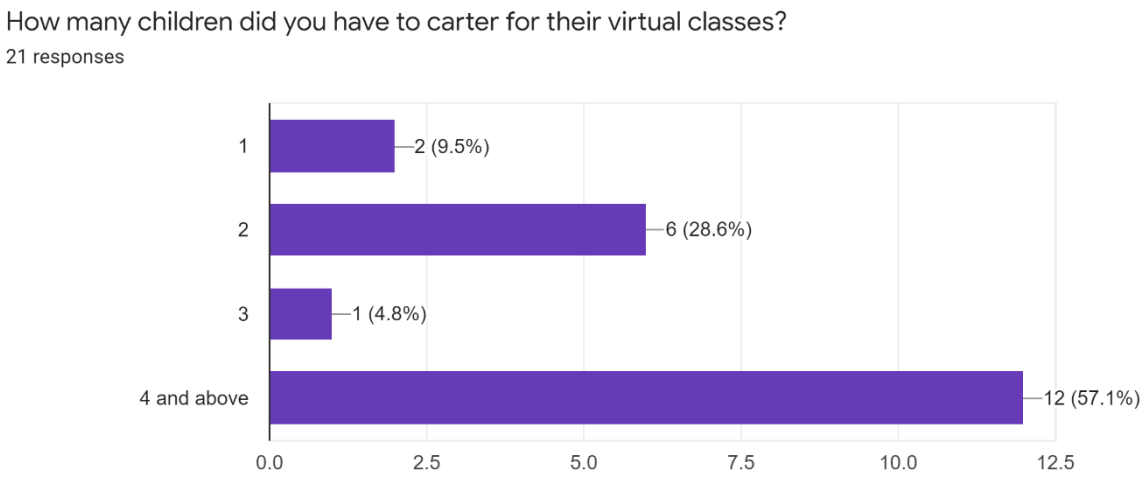

Chart 4: Children catered for their online classes.

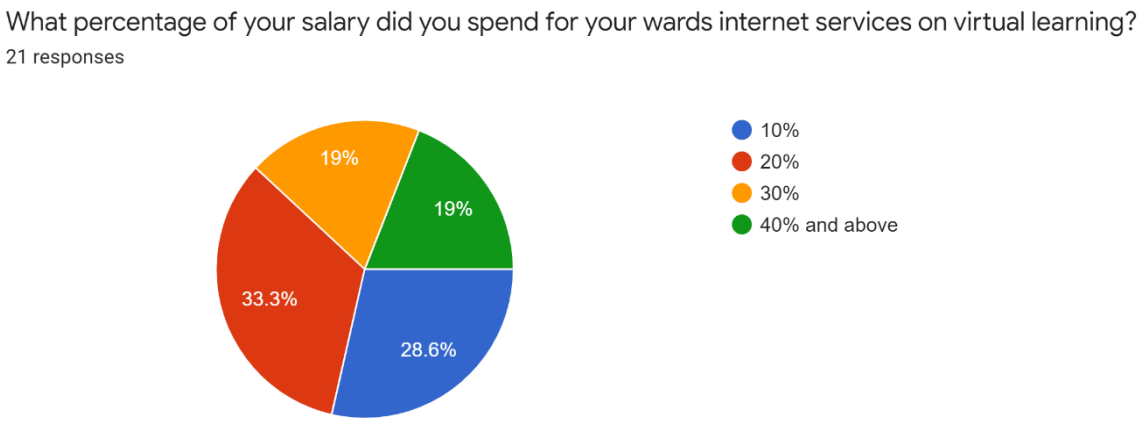

Chart 5: Percentage of salaries spent on online classes for wards.

When asked about the percentage of their salaries were spent on providing internet services for their wards' online learning, 21 teachers responded to this item with about 4 of them spending up to 40% of their salaries.
20 participants in the survey responded to the question "What do you think you would have done differently if you were a school administrator to better the condition of teachers during the Covid-19 pandemic? The responses provided by the teachers are as follows:

Responses	No of teachers
1. **Better Internet services**	7
2. **Financial support**	6
3. **Pay full salaries**	5
4. **Training teachers to run an online classroom**	2
5. **Providing equipment for a digital classroom**	2

Table 1: Teachers' responses to their suggestions as school administrators.

Majority of the teachers were concerned with the provision of internet services for online learning during the pandemic, which sadly has not improved till date. Following next is the financial challenge faced by these teachers during the pandemic as a result of salary reductions and lack of additional assistance, and the much-needed support. One of the teachers wrote that receiving at least up to half of the salary would have been helpful considering the doubled expenses incurred from purchasing data services at a high cost and being able to provide basic needs for survival during the pandemic. Next up, the teachers showed concern about the difficulty they experienced switching instantly to the online classroom as some of them were just encountering it for the first time. Lastly, some were concerned that they did not have personal computers and other related equipment. One of the teachers quoted that the school administrators should "provide them with adequate trainings and financial resources like data, software, and incentives that would make their

work easier especially before kicking off online classes or during the process. To be fair, the major challenges faced by teachers are financial and psychological stress".

To the question "What can Nigeria do to prepare the educational system for drastic changes like the Covid-19 pandemic?" 21 teachers responded as presented in the table below.

Responses	No of teachers
1. Proper equipment for schools to ensure a sustainable educational system	**5**
2. Digital training for teachers	**4**
3. Creating a budget for emergencies in education	**3**
4. Enabling the development of students ICT skills	**2**
5. Providing better and affordable internet services in Nigeria	**2**
6. Improving the educational system	**2**
7. Ensuring job security for the teaching profession	**2**
8. Health care and training for teachers to ensure teaching continues	**2**

Table 2: Preparing the educational sector for drastic changes

Two teachers, for this question item, expressed pessimism about the government's ability to handle such emergencies and hence looked forward to a bleak future. One of those two teachers expressed concern that since the outbreak and the challenges encountered, the government has not done anything differently to help the educational system in Nigeria till now. The teachers showed the most concern for the state of the schools in Nigeria and suggested that the schools be equipped with better facilities that would ensure a sustainable educational system in the event of any future pandemic or event that could hamper the progression of education. This was followed by the need for trained teachers who could swiftly move to distance learning and properly use the facilities required, when necessary. Other teachers were concerned with government intervention in the internet services in Nigeria given the high cost of purchasing data that could be sufficient to teach each lesson, and the health and safety of teachers and the security of the teaching profession in the face of a pandemic, among others.

Discussion and Recommendations:

The teaching profession in Nigeria took a major hit during the Covid pandemic, begging a question of its sustainability in the face such major societal disruption. The teachers who

participated in this survey had their salaries slashed with little or no consideration to their needs and all those who depended on their income. A percentage of them lost their jobs amidst the disruption created by the pandemic, which could result to anxiety and depression. Some of the teachers expressed concern about how such inadequacies created by these challenges reflected badly on them as teachers and would have preferred the parents and students made aware of the limitations the teachers faced with very limited resources at their disposal to carry out the online learning for the during of the pandemic lockdown.

Based on the results of this survey, it is recommended that school administrators and the government, provide some training into the proper use of ICT materials for teachers, as well as equip the schools with the equipment for carrying out online learning. Given the cost of internet services in Nigeria, the benefits of incorporating digital learning should persuade the stakeholders of education to ensure that teachers can freely access the internet to carry out their lessons. Due to the sensitive position teachers occupy in the society to ensure the preservation of knowledge, these teachers feel strongly that some budget to be created for education and ensure the job security of the teaching profession, irrespective of societal changes. Falecki and Mann (2020) opined that proffering positive psychology interventions such as identifying teachers' character strengths and celebrating their achievements will improve their wellbeing, as well as reduce depressive symptoms. Actively managing the human resources of any organization including the schools will positively influence the wellbeing of teachers, ensuring that information about their progress and challenges are addressed to provide adequate support (Bakker & de Vries, 2020).

Conclusion:

The Covid-19 pandemic presented a lot of challenges for education in Nigeria and was mostly felt by the teachers who had to ensure the continuance of the learning process amidst that. This, however, presents an opportunity for reflections into innovative and creative measures that would ensure that education becomes sustainable despite the dynamic state of society. Empathy and support of both the government and stakeholders of education will help teachers maintain sound mental state while rendering quality service to the students, ensuring that learning objectives are met, and keep the teaching profession attractive for continuity. Teachers like other professionals, cannot successfully teach without some basic equipment, and digital education or learning requires the use of computers with access to internet services and electricity, without which this process becomes futile. When teachers are paid low salaries that either get slashed or teachers are subtly pressured to use their income to fund capital intensive lessons at the detriment of their personal needs and responsibilities, the whole educational system has then failed to protect the future of education in Nigeria. Providing the needed materials for teaching, will prove effective for motivating teachers to give their best, and ensure they are committed to the academic achievement of students as well as their careers as teachers.

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Online Education in the (post-)COVID era

A MOOC Inclusive Platform Open to Deaf Role Models

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Abstract

Accessibility of Massive Open Online Courses (MOOCs) platforms is a revolutionary approach to distance teaching and learning. However, there is limited research on the accessibility barriers of MOOCs for learners with disabilities. Recent research has manifested the need for implementing an inclusive approach regarding MOOCs accessibility, thus meeting the requirements of the UN Convention on the Rights of Persons with Disabilities and the national Law for accessing ICTs and knowledge.

The main purpose of this paper is to present a newly designed and implemented accessible MOOCs platform for the training of Deaf adults as Role Models in Greece, Bulgaria and Malta.

The OpenpediaX platform was developed on the popular open source EDX platform built by Harvard and MIT, which fully complies with the legal requirements of the US and follows international standards and principles for web accessibility and Universal Design for Learning.

Specifically, we present additional accessibility formats for the needs of our target population with the use of Signed language videos that incorporate open and closed captions with downloadable transcripts, native signer presentations in three national Signed Languages, as well as in International Sign and online sign language support. The primary goal is to meet not only the diverse needs of our Deaf learners in the three countries involved but also the needs of Deaf learners from other countries around the world.

All accessibility features are to be focused upon the areas of certification and completion of studies, assignments, discussion forums and progress reports. Personalization options will be evaluated in order to adapt the educational environment to Deaf adults individual learning needs.

Keywords: massive open online courses, inclusive training, openpediax platform, deaf role models.

1. Introduction

Accessibility is a human rights issue that the United Nations has addressed. The United Nations Convention on the Rights of Persons with Disabilities (CRPD, 2006) recognizes and promotes the use of signed languages and establishes accessibility as a prerequisite to enjoying the rest of the rights protected by the Convention.

The CRPD, the first international treaty that explicitly mentions sign language, is a human rights instrument with great importance for Deaf people. Article 24 (Education) (5), mandates that «...persons with disabilities are able to access general tertiary education, vocational training, adult education and lifelong learning without discrimination and on an equal basis with others. To this end, States Parties shall ensure that reasonable accommodation is provided to persons with disabilities.».

Massive Open Online Courses (MOOCs) offer openness, structured learning, minimal financial burden, individual planning of time, pace and place, and lower participation barriers in comparison to other online or formal learning. Accessible content is a major requirement towards a successful path to universally accessible e-learning (Spyropoulos et al., 2020). Nevertheless, limited progress has been made, so far, in producing universally accessible MOOCs or producing MOOCs to meet specific accessibility needs of learners with disabilities, such as adaptive interfaces for the Deaf (Iniesto et al., 2016).

Recent research has illustrated the need for adopting a holistic approach regarding MOOC accessibility and thus meeting the requirements of the UN Convention on the Rights of Persons with Disabilities and national Laws (Bozkurt et al., 2020; Kourbetis & Gelastopoulou, 2017; Kourbetis, Karipi, & Boukouras, 2020; Kouroupetroglou, 2015; Sanchez-Gordon, & Lujan-Mora, 2016; Zhang et al., 2020).

Therefore, the development of accessible interfaces in digital resources for the adult education of Deaf Role Models (DRMs) using information technology offers solutions to support Deaf adults' maximum learning. We argue that using digital, open and accessible resources will enhance inclusive, effective and accessible learning in the field of Deaf adult education.

1.1 The need to train Deaf Role Models

Most Deaf people (about 95%) all over the world have hearing parents and do not come in contact with Deaf adults and Sign Language (SL) before they enter primary school education (Hadjikakou & Nikolaraizi, 2008; Mitchell & Karchmer, 2005). Besides, most deaf children (90 to 95%), in contrast to most hearing children, are brought up in poor linguistic environments (Mitchell & Karchmer, 2004, 2005), since their parents, caregivers and teachers are not fluent signers and cannot provide them with natural language input to support their social, emotional and language needs (Golos et al., 2018; Singleton & Newport, 2004). This lack of knowledge and contact marginalizes Deaf people, their SL and their Deaf culture (Hindley, 2005; Hoffmeister & Caldwell-Harris, 2014; Young, 2003).

This state of affairs mandates the need to train Deaf adults to act as Role Models for hearing parents of Deaf children. Due to the importance of early and accessible language and communication and the development of positive self-esteem, it is critical that parents have resources allowing them to help their child develop language and cherish full interaction with their family. According to theoretical and field research findings, exposing children early to Sign Language, proper teaching tools leads to

gradual maturation of the language and corresponding developmental milestones of Deaf children are achieved (Hatzopoulou, 2008).

There are many definitions of Role Models in the research literature, both in terms of role models' personal characteristics and the function of a role model relationship. These definitions include informal life coaching (Thompson & Kelly-Vance, 2001), personal support and guidance (Rhodes, 2005), enhancement of specific skills, such as literacy and preventing dysfunctional behaviors (Austen, 2010; Sinclair, Christenson, & Thurlow, 2005) or supporting families and d/Deaf young people (Rogers & Young, 2011; Watkins, Pittman, & Walden, 1998).

Deaf adults can be excellent Role Models for Deaf/hard of hearing children and their families for providing social-emotional and language support (Gale et al., 2021). By drawing on their own experiences, Deaf practitioners can show to hearing families that deafness does not need to be a barrier to achievement. The prospect of meeting and getting to know Deaf adults who have the experience of growing up Deaf and having opportunities to ask questions about what it is like to be Deaf could challenge the negative stereotypes about Deaf people (Wilkens & Hehir, 2008). Moreover, Deaf Role Models can ease parents' fears by sharing positive life experiences; informing families of upcoming Deaf events; providing access to supportive networks; giving 'real life' examples about self-advocacy; and providing authentic opportunities to practice SL (Byatt, Dally & Duncan, 2019; De Clerck & Golos, 2019; Rogers & Young, 2011). Programs that have diverse representation of highly qualified Deaf professionals in first-contact roles simply make parents aware of the wide-ranging expertise and professions that Deaf professionals have (Yoshinaga-Itano, 2014). With a view of enhancing the role of Deaf practitioners as Role Models and Sign Language teachers (Giaouri, Hatzopoulou, Karipi & Alevriadou, in preparation) we have developed a training program for Deaf adults, the OpenpediaX Training platform which educates them to become Role Models. The training of Deaf adults as Role Models practitioners aims at supporting and empowering hearing adults (practitioners, family members, coworkers) to work and associate with Deaf people from their early years to adulthood.

2. The OpenpediaX Training platform

The OpenpediaX is an innovative, online-learning platform that promotes accessibility for everyone, including Deaf learners and learners with or without other disabilities. The open source platform of Open edX (https://open.edx.org/) was used for our MOOCs platform. This platform was founded by Harvard University and Massachusetts Institute of Technology (MIT) in 2012 and it fully complies to the legal requirements of the US and follows international standards and principles for web accessibility and Universal Design for Learning.

Open edX is an online learning destination and MOOC provider, offering high-quality courses from the world's best universities and institutions to learners everywhere. Open edX is the only leading MOOC provider that is both nonprofit and open source and most importantly accessible to Deaf learners. Our innovative project «Sign Links» (https://signlinks.eu/) provides a shared resource for our partners and participants, with access to higher-level learning using only a computer and an Internet connection. The Open edX platform was adapted so as to enable us reach thousands of Deaf learners, some of whom may lack the typical backgrounds and resources of hearing learners.
The use of the OpenpediaX Training platform includes two strands:

a) The associations of the Deaf in Greece, Bulgaria and Malta (partners of «Sign Links») will be

delivering professional development within the context of Deaf users and in turn b) the participants will be developing peer (or coaching) networks to facilitate implementation of new knowledge.

b) The use of the platform will result in the reduction of spending costs for professional development since all training material will be archived, thus providing utility to more trainers and trainees. In the development process we have followed international standards and principles for web accessibility (W3C WCAG 2.0, https://www.w3.org/WAI/) and Universal Design for Learning (https://udlguidelines.cast.org/), accessible by everyone, to the greatest extent possible, without the need for any additional adaptation. Every effort has been made to comply with all national and European applicable accessibility laws.

2.1 The platform capabilities

The learners only need adequate internet access and an e-mail. The platform provides:

- Easy access to and navigation in the training material with Modules per week (sectors).
- Easy course creation by trainers Multiple types of questions.
- Easy / automatic evaluation of closed-ended responses that offers flexibility and convenience.

The openpediaX platform includes fully accessible videos with control of captions, speed, volume, screen size, and languages to create a more engaging and rewarding online learning environment.

Trainers can use tools that encourage collaboration and communication among trainees. Furthermore, all users can join discussion forums, use peer assessments as well as social media sites to connect with other students and get support from the course staff. Trainees can chat with other learners and trainers via an asynchronous communication forum that enhances the sense of community and enriches interactive learning.

OpenpediaX platform hosts three main courses, and one Demo course for the use of the platform (Fig.1) all in Greek and English with Greek Sign Language and International Signs and under development in Bulgarian with Bulgarian Sign Language and Maltese with Maltese Sign Language as follows:

1. DemoX (http://www.openpediax.com/courses/course-v1:OpenpediaX+Op1+2021_D1/about)
2. Role Models Teaching Guide for Parents (http://www.openpediax.com/courses/course-v1:OpenPediaX+RMP1+2020_R1/about)
3. Teachers Guide of Deaf Role Models-Teaching Sign Language to hearing adults (http://www.openpediax.com/courses/course-v1:SignLinks+SL01+2021_T1/about)
4. Deaf Role Model Guide: From the Deaf for the Deaf (http://www.openpediax.com/courses/course-v1:SignLinks+DDG101x+2021_T4/about)

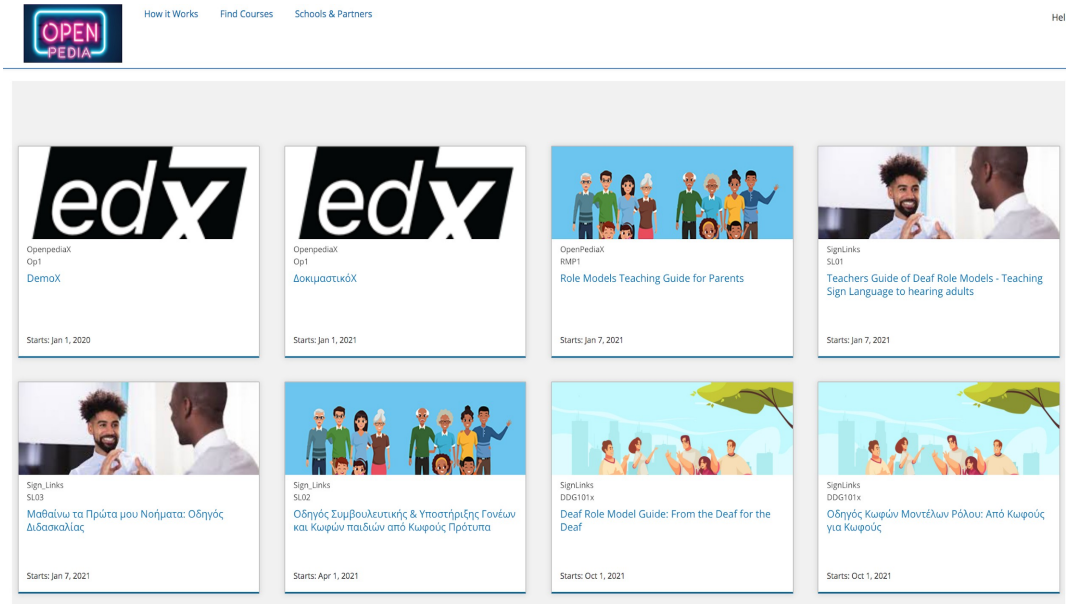

Figure 1: The openpediaX training courses.

3. The development and production

The development and production of the openpediaX platform for Deaf learners follows the basic accessibility technological requirements proposed by Kouroupetroglou (2015) and Zhang et al. (2020). Specifically, the aforementioned researchers have recommended four accessibility attributes that researchers should focus on when providing Open Educational Resources (OER):

Perceivable Content: Information is presented to users in modalities they can perceive—in Signed Languages and in written languages. We use Deaf native signers and professional Signed Language interpreters for the signed content of the platform, making in this way the content even more meaningful and useful for the majority of Deaf and hearing adults that have limited access to native sign language input.

Operable Platform and Software: The interface components, navigation, browsing and searching require simple interactions that Deaf adults can easily perform, even with minimal technological skills.

Understandable Content: Content is fully understandable and tested with end users. The levels of content aredifferentiated according to the needs of all language users.

Robust Content: The educational material meets the training needs of Deaf Role Models. All interfaces are interrelated, open, and accessible to a wide variety of users, including parents and teachers of Deaf children.

In the post- production phase of our project we offer online sign language support to meet the diverse needs of our Deaf learners in the three countries involved, as well as Deaf learners from other countries of the world. All courses were developed and implemented with the involvement of Deaf Role Models that are native or near native signers of their national signed language and international signs.

4. The use of Signed Languages as an accessibility feature

Spoken languages are articulated by the mouth and vocal area and sensed mainly acoustically, even though manual gestures and mouth movements are also vital for spoken languages. Signed languages are articulated by the hands, face, and body and they are perceived visually. Signed languages are complete, natural languages of the Deaf communities all over the world. Signed Languages, in contrast to spoken languages, are particularly suited to the visual nature of the Deaf, with "their ability to see", and this makes them perfectly accessible to any Deaf person (Hill, Lillo-Martin & Wood, 2019; Lane, Hoffmeister & Behan,1996).

The socio-linguistic analysis of natural Signed languages revealed that Signed languages have the same characteristics as those observed in spoken languages in terms of change, linguistic diversity, social and cultural use (Kourbetis & Hatzopoulou, 2010).

International Sign (IS) is a pidgin- signed language, which is used mostly at international meetings, conferences, etc. Besides, IS is used between signers who lack a common Signed language or is broadcasted for viewers internationally (Supalla, & Webb, 1995). The use of three Signed Languages (Greek, Bulgarian and Maltese), as well as International Signs is the ultimate accessibility feature of the openpediaX platform (Fig 2).

Figure 2: . Native Signers and hearing interpreters for accessibility through a Signed language.

5. Captions and interactive transcripts

The National Association of the Deaf requires ensuring access through quality captioning when developing video content in the Internet after a landmark settlement of the National Association of the Deaf (US) with Harvard University (with MIT is the developer of the edx platform) to improve online accessibility. Particularly, «Captioning video content is a basic form of access that opens up academic learning to not only deaf and hard of hearing people but the world.» (NAD, 2019).

Deaf learners are not able to access audio content and they need the presented information in a screen- reader- accessible alternative format, such as captions (closed or open) and interactive transcripts, preferably downloadable text- only, without time codes (Fig3). The openpediaX platform supports the use of interactive transcripts and can be downloaded in an either .txt or .srt format.

Interactive transcripts are necessary for presenting audible and signed content to all learners, Deaf or hearing, native or not native signers or readers.

Transcripts corresponding to video content appear alongside the video and allow all learners to better comprehend the video content and navigate to a precise segment of the video by clicking on the transcript text. Captions and interactive transcripts can either be shown or hidden by the user.

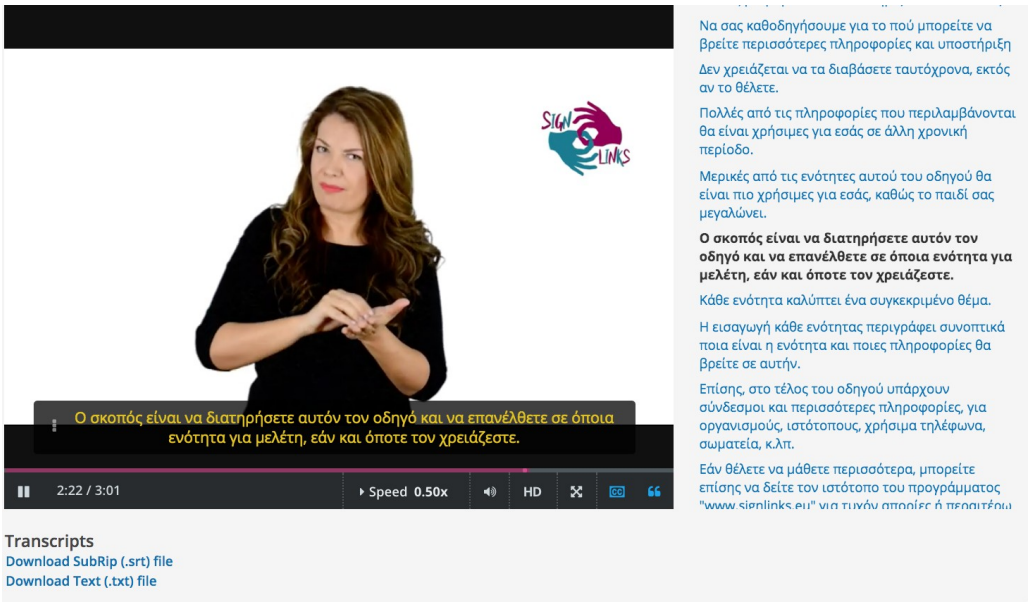

Figure 3: . Interactive transcripts and functions of the video player of the platform.

6. Training with practice

We have developed alternative or complementary modes of assessment of courses, including self, formative and peer assessment. Assessment of courses is based on responses to multiple-choice questions (assessed automatically) and writing an essay describing an educational activity (assessed by the instructors). The platform enables training to be tailored to DRMs needs, their tracked learning and course or trainee reports produced for the certification.

We encourage and support collaborative practices among DRMs, such as joint preparation of lessons in order to observe and learn from peers, regular team meetings to obtain meaningful feedback on self-efficacy and satisfaction, peer mentoring to share and reflect on their experiences, thus fostering learner autonomy.

We have also organized the training of regional trainers (Deaf Role Models) as well as coordinators for support and guidance promoting an informal self-directed active learning through collaboration and creativity.

Deaf Role Models that have not yet undergone digital competence training may not find the courses on offer that attractive. To overcome this barrier, we have adopted and developed an additional introductory accessible course, named DemoX (in Greek, English, with Greek Sign Language and soon in International Signs). This short demo shows the user how to take a course in OpenpediaX, learn how to navigate the platform, complete assessments and contribute to course discussions.

Finally, our training includes practical experiences in groups of parents of deaf children and hearing professionals who work with the Deaf. The groups meet on Saturdays, usually from 5 to 8 pm in Athens. Additional practicums are implemented in Thessaloniki (northern Greece), in Bulgaria and Malta from the partners of Sign Lings project.

7. Impact and potential

The MOOCS OpenpediaX platform, having a transferability potential, is expected to have a considerable impact on the education of the Deaf. Organizations of the Deaf Communities will have a platform providing a network of Deaf and hearing learners, allowing them to discuss specific content tailored to their needs. All training material will be archived and hopefully be accessed and used by more trainers and trainees. In sum, the OpenpediaX training platform, will better support not only the Deaf adult education and training but also Hearing people in a learning environment that promotes equity, diversity and inclusion. As such, materials, documents and media produced will be made freely available and promoted through open licenses. This capacity of the OpenpediaX training platform will continue to have an impact and will be producing results even after the EU grant has been used up.

The Covid-19 crisis has presented us with an opportunity to rethink and improve our training practices to meet the new challenges that we are all faced with. We continue our educational process with effective practices for online teaching and learning using the online learning platform designed and operated by Open Pedia, a partner of the Sign Links project and develop tree courses: 1) Role Models Teaching Guide for Parents, 2) Teachers Guide of Deaf Role Models - Teaching Sign Language to hearing adults and 3) Deaf Role Model Guide: From the Deaf for the Deaf.

Six months after the start of phase II of the sign links project, the Covid-19 pandemic caused major disruption, affecting our project, too. Both schooling and the project continued, even though in both cases with a dependence on digital environments. The pandemic is likely to have long-lasting and yet unforeseeable consequences. It has presented a major test for education systems across the world. In Greece, according to a report in late 2020, 'it worked as an accelerator in order to introduce e-Learning to a larger scale. In addition, measures such as the introduction of mobile learning challenged traditional formal education practices to adapt to this new reality' (Bozkurt et al, 2020, p.58).

The European Union Digital Education Action Plan (2021-2027) aims at supporting the development of a digital education ecosystem in all EU Member States that requires "infrastructure, connectivity and digital equipment; effective digital capacity planning and development, and high-quality learning content, user-friendly tools and secure platforms which respect e-privacy and ethical standards." (European Commission, 2020). https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_en

8. Conclusions

Our aim is to enable a large section of the population of Deaf adults to engage in quality education of real value, which would otherwise be missed. The accessible, user-friendly multimedia based, openpediaX platform is used as a standard in our training program to support primarily the main procedures of distance, open, lifelong and continuing training for Deaf people.

The set of the telecommunication and information services, adjusted to Deaf people's special needs via the means of Signed Language, is a certain method towards the general improvement of the educational and training services provided for Deaf adults.

The training is designed to be fully inclusive and accessible and covers evaluator skills, safeguarding, confidentiality, communication, information gathering and reporting. Further training in human rights, theory of participation, deaf identity, safeguarding and equality would hugely benefit the

DRMs and enable them to advocate more effectively for the Deaf children and the families they work with.

The transferability potential is great, since the training program can be used in all three countries (Greece, Bulgaria and Malta) and potentially in other countries as well. This training program will be fully certified after a thorough evaluation process. The Sign Links Project aims at training a workforce of DRMs and making them available both for Deaf people, hearing adults, practitioners, co-workers and families with deaf children.

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Applying on-line (digital) active participatory teaching techniques during the COVID-19 pandemic, in the School of Pedagogical & Technological Education (ASPAITE), Greece.

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Abstract

The COVID-19 pandemic is perhaps the greatest challenge to education systems worldwide and it has spread its effects on the teaching-learning process of all educational levels in all countries. Since March 2020 face-to-face teaching has been suspended by the Greek Ministry of Education, too. So, tertiary education institutions had to switch to online teaching and virtual education. Although the framework and the tools have changed, the responsibility of giving quality education has remained intact. To this aim, attempts have been made to apply participatory teaching techniques, so as digital classrooms can be interactive. Given that face-to-face communication cannot be replaced, the aim was to adapt the course to the new conditions, with the least possible concessions on the quality of teaching and students' active participation. In this article we focus on the application of active participatory teaching techniques in the School of Pedagogical and Technological Education (ASPAITE), in Greece. The active participatory teaching techniques applied in a group of second-year students of the Department of Electrical Engineering and Electronic Engineering Teachers, during the academic year 2020-2021, are described. The views of students for the use of active teaching techniques during COVID-19 era, are also be explored, captured through an asynchronous activity in the course "Teaching Methodology". Concluding remarks will be made to contribute to the debate on improving teaching and learning in higher education, even in digital classrooms.

Keywords: Greek higher education, digital classrooms, active participatory teaching techniques

1. Introduction

The pandemic COVID-19 is perhaps the greatest challenge to education systems worldwide. National education systems tried to make appropriate preparations in the short time available, in order to address students' needs by level and field of study. COVID-19 has spread its effects on the teaching-learning process of all educational levels in Greece, too.

In the current difficult conditions face to face teaching has been suspended by the Greek Ministry of Education. So, tertiary education institutions had to cease face-to-face instruction and switch to online teaching and virtual education which, in turn, may affect –among others - teaching strategies and techniques to a great extent.

The responsibility of giving quality education was remained the same, but the framework and the tools have changed. In this context, significant efforts have been made to continue the use of participatory techniques,

in order to engage students in the educational process. The aim was to adapt the course without any reduction in the quality of teaching and the active participation of students.

The challenge was to deliver quality education through a computer screen using active teaching tools for higher education. Drawing upon this experience, in this article we seek to describe and discuss the application of active teaching techniques in ASPAITE, a tertiary education School in Greece.

Initially and in order to introduce the framework for the implementation of active participatory teaching techniques, the structure and operation of the School are briefly described. Then we turn to the techniques themselves, as applied to second year "Electrical Engineering and Electronic Engineering Teachers" students during two courses: "Educational Assessment" and "Teaching Methodology". The difficulties as well as the benefits that resulted from this application as experienced by both the teacher and the students are presented.

Finally, the comparative and synthetic analysis of the views of the teacher and her students is critically discussed, in order to identify the benefits and difficulties of applying active teaching techniques in a digital environment.

Our aim is to offer opportunities for discussion on the application of active participatory teaching techniques in tertiary education, in order to contribute to the active participation of students in a democratic higher education, even in digital classrooms.

2. COVID-19 Pandemic and Education in Greece

In March 2020, most countries worldwide acknowledged the existence of the pandemic COVID-19 and introduced physical and social restrictions (Sfakiotaki, 2021). Since then, societies have been forced to redefine themselves and gradually adapt to new circumstances. The pandemic affects the whole of social and economic life and has significant effects primarily on the health and economic life of individuals and on social institutions such as family and education (Anwar, Mansoor, Faisal & Khan, 2021; Eschenbacher & Fleming, 2020).

The emergence and spread of COVID-19 virus around the world have created extraordinary social conditions and forced the world community to take action in all areas of human activities in order to fight the virus and deal with the pandemic (Bjursell, 2020). The world of education did not remain unharmed by the new conditions. Thus, the educational process is currently carried out mainly through distance learning in all structures and levels of education. Education internationally is forced to adapt to new ever-changing social

conditions, to undergo fundamental changes and to be carried out differently with the help and mediation of technological means (Anwar, et.al., 2021 ; Kang, 2021).

The accelerating digital transformation of education is apparent in two main trends: the increasing innovation in educational technologies and the expansion of distance education (Kang, 2021). These findings are accompanied by skepticism and concerns about the further widening of educational inequalities due to the digital divide and suggest investment in technological infrastructure in education services. Eschenbacher & Fleming (2020) focus on the impact of new pandemic on educators. They feel that teachers are experiencing disorientation, questioning previously held assumptions and seeking new pedagogical proposals to meet emerging learning needs. Grivopoulou & Karakatsani (2020) further add that emergency conditions can be a springboard for a fully digitized education, with significant benefits for students, in case they acquire the technological skills and digital literacy, which are deemed necessary qualifications in the modern post-industrial era.

Given the defective technological infrastructure, the pandemic found the Greek educational system unprepared to meet the challenge of rapidly diversifying the educational process and switching into distance learning with significant implications for the world of education (Raptis, 2021). Under these unprecedented conditions and unacknowledged adversities, teachers are called upon to carry the responsibility of keeping the learning practice alive (Raptis, 2021). For tertiary education, these changes have catalytic effects, which will be presented briefly in the present work, given that both the extraordinary social reality and the research processes are in progress.

Since the beginning of the pandemic, in March 2020, lifelong learning has discontinued, e-learning has been introduced and the entire educational community has been struggling to operate in the new context on the basis of individual initiative and concern, as the central administration, at least until the end of the 2020 academic year, could not adequately respond to the need for technological equipment and educational material required by distance learning (Raptis, 2021).

Apart from lockdown isolation and distance learning that affected the learning process throughout the last academic year, a basic problem we are currently facing concerns technological illiteracy that spans across both educators and learners, as the degree of familiarity with new technologies varies throughout the knowledge scale, resulting in the establishment of new forms of educational inequalities between the members of the educational community (Raptis, 2021 ; Sfakiotaki, 2021). The reliance on technology that this condition implies highlights a second problem, namely the inability of many people to access Internet

services and the lack of necessary infrastructure in technological means for the smooth operation of the educational practice (Grivopoulou & Karakatsani, 2021; Raptis, 2021).

3. The case context - The structure and function of ASPAITE

ASPAITE is a School of Tertiary Education, which consists of four Departments:

- Pedagogical Department
- Department of Electrical Engineering and Electronic Engineering Teachers
- Department of Mechanical Engineering Teachers
- Department of Civil Engineering Teachers.

The Degree awarded by the Technological Departments of ASPAITE qualifies students both as teachers, in various areas of Secondary Education, and as vocationally qualified professionals and is granted after 10 academic semesters, which include a diploma dissertation and internship.

During teaching in ASPAITE, active methods using working groups, projects, etc. are usually applied. Modules also include monitoring, observation, planning of educational intervention and implementation of micro-teaching. In this context, teaching aims to promote skills, such as: digital skills, collaborative learning skills, creative and critical thinking skills, learning skills and lifelong learning skills.

4. The research context and methodology

The present qualitative study highlights the impact of COVID-19 pandemic on the use of active teaching techniques at the tertiary education in Greece both from the teacher's and students' perspectives.

Since March 2020 face-to-face teaching has been suspended by the Greek Ministry of Education. So, tertiary education institutions had to switch to online teaching and virtual education. In this context we focus on the application of active participatory teaching techniques in the School of Pedagogical and Technological Education (ASPAITE), in Greece.

The active participatory teaching techniques applied in a group of second-year students of the Department of Electrical Engineering and Electronic Engineering Teachers, during the academic year 2020-2021, are described. The views of students for the use of active teaching techniques during COVID-19 era, are also be explored, captured through an asynchronous activity in the course "Teaching Methodology".

The research questions were the following:

1. Which active participatory techniques were used during distance education in ASPAITE?

2. Which are students' aspects about their experience of active participatory techniques in ASPAITE?

3. Which were the benefits of the use of active techniques in distance education in ASPAITE?

4. What were the difficulties from the use of active techniques in distance education in ASPAITE?

The comparative and synthetic analysis of the views of the teacher and her students is then critically discussed, in order to identify the experiences, benefits and difficulties of applying active teaching techniques in a digital environment.

5. Findings and discussion

The techniques applied were mostly the following: the brainstorming method, as it seems to offer: a) easy preparation by the teacher as she feels confident in herself and will not be threatened by inexperience, lack of time and self-confidence (Rogers, 1999) and b) adequate involvement of the students, as they have direct and shared experience, given that the longer the students remain in a passive state, the more difficult it is for them to be active in the future (Kokkos, 2005).

The technique was implemented utilizing the Ms Teams educational platform. Specifically, two ways were used after sharing the worksheet on the e-learning screen: a) listing the ideas in the chat, entry by the trainer (host) on the worksheet and then sharing and b) listing the ideas on the badlet and then sharing it. The brain storming usually lasted about 20 minutes, that is: a) 5 minutes for instructions and motivations from the teacher to reveal the multiple aspects of the issue and the enrichment of knowledge, b) 10 minutes for the indication of ideas including the interventions required by the teacher if the storm slips into a show of imagination and c) 5 minutes for the conceptual organization of the ideas that will be the starting point for the presentation that usually follows (Kokkos, 2005).

The enriched presentation combined with demonstration was the second mostly used technique, as it seems to cover more of the training program due to the aspirations and educational needs of the students. The presentation file can be shared on the Ms Teams screen using simple actions. The presentation was enriched by recalling and utilizing words and phrases of the students. We have to admit that the effectiveness of this technique seems to depend on the readiness and empirical competence of the teacher.

Working in small groups enriched with video projection is chosen as another useful technique to highlight critical features of each topic. Videos were shared on the Ms Teams screen using simple actions. Nevertheless, and to avoid unexpected difficulties, saving resources on the teacher's computer is highly recommended. Different groups came up with different remarks encouraging the development of dialogue concluding to a fertile composition organized mainly by the teacher. In all occasions, time management needs to be taken into account.

Even in these adverse conditions, I tried to make use of all the advantages offered by video conferencing platforms, such as Ms Teams, so that teaching was active and interactive. I also used a variety of media, e.g.: boards, power points, videos, interesting websites, etc.

We have to admit that face-to-face communication cannot be replaced, nor can break rooming replace live group work. However, the bright side of online teaching needs to be also highlighted. Students proved very competent in the use of internet, often suggested sources that are closer to their interests and this made them more participative. In addition, online facilities make the circulation of files easier, as teacher is not obliged to find them by herself or print and share them. Moreover, as students are more familiar with new technologies, sometimes they take on the teacher's role to solve problems concerning the use of the platform or/and suggest new teaching tools.

During the course of "Teaching Methodology" an asynchronous activity using the e-class platform of the school was took place. It was an opportunity for students to share their views about the use of active teaching techniques during COVID-19 era.

> "*Participatory - active activities made the lesson more interesting and interactive and kept our interest undiminished, something very important in the context of distance learning as so many hours of sitting in front of a screen did not help*" (A6)
>
> "*They gave a different perspective on learning by creating a climate of interaction and exchange of views between the students and the teacher, especially when the online course is inherently impersonal*" (A8)

The way they experienced their participation in the online groups, whenever they were used in our online courses was obvious in the research.

> "*My participation in the internet groups was very interesting because it was an experience I was not familiar with. At the same time I discovered new possibilities that can be applied in the course. One of them, which was remarkable, was the ability for each student to export their screen sharing and work on it*" (A3)
>
> "*The experience of participating in online groups was quite good and helped a lot in learning faster. Furthermore, the voice was a significant motive for me to participate*" (A6)
>
> "*Distance activities create new relationships, as the use of digital tools involves a different dynamic. The exchange of ideas, the answers through investigation and the presentation of the works enhance communication, learning, intimacy and goal achievement*" (A3)

In addition, the familiarity of students with new technologies appeared in their answers:

> "*The new generation of students who have grown up in technology is more familiar with social media. Automatically, online course activities provide an alternative way for us students to acquire knowledge*" (A1)

Nevertheless, the isolation of each student and each computer screen is obvious:

> "*It was pretty good, but just up to a certain point. A little bit later, you miss the classroom where you were with your classmates and you were chatting all the time*" (A9)

Concerning the benefits from the use of active techniques in the course, the issue of full coverage of each topic emerged.

> "*Participatory activities enable the global coverage of each topic*" (A4)

The opportunity for exchange of views and communication even through a computer screen, during this difficult period of pandemic, appeared in the research.

> "*The participatory active activities in the online courses are an important part for the conduct of the course. This is because students are given the opportunity to participate more actively in the course, something very important, as the course takes place remotely*" (A2)
>
> "*I was given the opportunity to exchange views and communicate with my fellow students. It was also a good opportunity for more practice and learning through the activities of the course*" (A5)
>
> "*Through the techniques I developed the spirit of cooperation, teamwork, exchange of views and experiences. It also helped me develop my critical thinking*" (A8)

The contribution to the better understanding of the learning object became, also, apparent.

> "*The educational process is upgraded and at the same time the collaborative method promotes a new learning strategy for feedback and evaluation*" (A1)
>
> "*I benefited because due to my participation I could understand the content and also answer the questions that I probably had*" (A7)
>
> "*All the activities required by the participatory teaching techniques provide the opportunity to manage the educational material at the pace we desire, adhering to the completion of the learning process*" (A6)

Concerning the difficulties from the use of active techniques in distance education, students stressed that their familiarity with new technologies helped them meliorate the issue.

> "*There were no difficulties during the participatory activities, as the Internet environment is familiar to us and it is more attractive and interesting*" (A1)

The most frequently reported difficulties were due to the technical problems with the network connection and mainly the physical distance among the key partners of the educational process, teacher and students.

> "*The only difficulties were due to technical reasons and not to the course itself. A lot of times there was a bad connection and this made it difficult for me to attend the whole class"* (A7)
>
> "*There were times when technical problems made it difficult for the course to flow smoothly (internet connection interruption, etc.*)" (A12)
>
> "*There were no significant difficulties in conducting the online course activities, apart from some technical issues and the indirect communication with the fellow students due to distance*" (A6)
>
> *"It was difficult for me to attend a course for a long time in front of a computer screen" (A4)*
>
> "*The participatory active activities in our online classes were not the best, as due to the pandemic we are forced to be in front of a screen for many hours and this was very tiring for me. I did not find the energy to give a hundred per cent of my attention in the class*" (A3)

The need of self directed learning for teachers was also reported by students.

> "*Of course, a high level of self-directed learning is required on the part of the teacher which must be supported by creative learning strategies*" (A7)

6. Conclusions

The research focused on the application of participatory teaching techniques in ASPAITE during the era of pandemic COVID-19. The requirement for on-line distance education has changed the educational framework and tools. Nevertheless, the responsibility of giving quality education was remained the same. In this new and difficult context, the aim was to adapt the course without any reduction in the quality of teaching and the active participation of students.

The research showed that the challenge to deliver quality education through a computer screen using active teaching tools for higher education was a new and significant experience for both teachers and students with both benefits and difficulties.

The teacher of the research mostly used brainstorming, group working and the presentation enriched by questions/answers and conversation. Her long experience in adult education seems to help her to apply the techniques increasing the advantages and eliminating the difficulties of online education.

The current situation has brought teachers faster in the field of e-learning, as they are obliged to "embrace" the new teaching tools in order to use them in the best way for the benefit of student's learning. Although, in face-to-face education, body language and teachers' voice are important teaching tools, during online

courses body language and facial expressions seems more difficult to use as interaction is mediated by screens. Only “voice” can be fully operationalized. Therefore, in online teaching, teachers should reduce instruction time to the necessary minimum to allow students to participate and capture the key points of each topic.

The research showed that the use of participatory techniques had great benefits, such as the ability to "listen to” the views of a large number of persons during online teaching, something that cannot be done in a face to face meeting. In addition, collaboration, linked with active techniques, seems to promote learning and offer a new learning strategy for feedback and evaluation to all students.

Both teacher and students responded that face-to-face communication cannot be replaced, nor can break rooming replace live group work. Nevertheless, during this new type of educational process a gradual creation of new relationships among persons begins to appear. Although the isolation of each student behind his/her computer screen was obvious, they themselves as subjects of the educational process, tried to create new types of communication and relationships. Hopefully, the need for communication among human beings cannot be stopped. Hence, the use of participatory teaching techniques seems to contribute to the enrichment of this new educational era with opportunities for communication and construction of new human relations.

The most frequently reported difficulties were due to the technical problems with the network and mainly the physical distance among the key partners of the educational process, teacher and students. Our informants experienced the unprecedented pandemic educational conditions and suffered their adverse consequences, recognizing the technical malfunctions of the project and their impact on the quality of the educational product. Technical connectivity problems combined with a lack of technological equipment in the houses of a certain number of students intensifies the view that they do not get what they were looking forward to and are physically and psychologically exhausted. Nevertheless, they tried to take the greatest possible advantage. They did not give up the fight fueled by their belief in knowledge and their desire not so much for studying, but mostly for communicating.

In addition, the need for self-directed learning for both teacher and students has become obvious. Students in the research acknowledge that the choice of the use of active teaching techniques presupposes significant teaching skills and experience. Nevertheless, they point out that it is now necessary to cultivate the ability of managing their own self directed learning and to strengthen their active learning abilities outside the class. Given that teachers have less control over online teaching, the progress of online teaching and its learning

effectiveness largely depend on students' high-level active learning outside the class. To this end, teachers should use various participatory techniques to strengthen students' active learning outside the class, too.

At this point, we have to express our concern for the possibility of equal participation of the students. Our reservations concern the entire educational community, regardless of structures and levels, regarding the quality of knowledge provided and the inability of many members of the educational community to support it due to poor knowledge and lack of necessary equipment, as stated in the research of Kang (2021) on the impending fears of widening social inequalities from the digital divide.

As the pandemic phenomenon is still evolving, having an active presence worldwide, we could say that the aforementioned problems disturb the educational process and operation of tertiary education, regarding the removal of students from the school environment.

It has been shown that the use of participatory teaching techniques may be a measure of filling the distance and relation gap. Nevertheless, efforts by teachers cannot fully fill this serious gap. The application of the principles of participatory education, as well as experiential learning and alternative ways of education are difficult to achieve through e-learning, with lack of technological means and with insufficient teachers' training.

In Schools like ASPAITE, which usually attract student-workers in technical professions, the need for the use of active teaching techniques in digital environment is considered even more important. Teachers' responsibility seems to become more serious and heavier, as they have to help - to the extent that is appropriate for them - the participants in public technological education, which is constantly threatened and degraded by recent education policies. Concluding, it is important to point out that the lack of technical equipment seems to be more common among ASPAITE students, which is a technological school of tertiary education and prepares teachers for technical secondary education, too. The class sign of technical education is becoming apparent, something that requires definitely further future research and social concern, too.

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E-engineering Practical Resources Adaptation for the Use of VISIR within the European e-LIVES Project

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Abstract

The creation of online courses is a process that presents several difficulties, especially in STEM (Science, Technology, Engineering and Mathematics) related courses, where it is highly desirable to carry out the development and implementation of remote laboratories, to provide online practical training in real-time to students.

The e-Learning InnoVative Engineering Solutions (e-LIVES) Erasmus+ Capacity Building in Higher Education project aims to help develop a strategy for the implementation of e-learning courses in Algeria, Jordan, Morocco and Tunisia, partner countries of this project. To this end, one of the main objectives of the project is to help universities in the partner countries to design and develop e-engineering courses and to develop a remote laboratory with which students can carry out practical trainings. However, the remote laboratory that is being developed, like most remote laboratories, presents several restrictions that limit the possibilities in the development of the courses.

The Spanish University for Distance Education (UNED), as a partner of this project, has adapted the e-engineering courses developed in the project for its implementation with VISIR (Virtual Instruments System In Reality), a remote laboratory at the top of the state of the art of remote laboratories for wiring and measurement of both, electrical and electronic circuits.

This article presents the results of the courses adapted by UNED, comparing both solutions and highlighting the different approaches and advantages of the solution of using VISIR as a general one as well as a specific solution of the remote laboratory implemented by the universities in the partner countries of the e-LIVES project.

Keywords: Remote laboratories, VISIR, e-Engineering trainings.

1. Introduction

Over the last decade, e-learning has been gaining a significant interest and importance, having increased sharply in the last two years, due to the crisis caused by the COVID-19. This type of education allows access to this training to a large number of students without the need to attend a centre in person. This is of particular interest in the case of universities in South Mediterranean countries, where the number of students has more than doubled in the last 15 years, which has caused difficulties for universities, leading to overcrowded classes (Thati et al., 2019).

However, the creation of online courses is a challenging process, particularly in STEM (Science, Technology, Engineering and Mathematics) related courses, where the development and implementation of remote laboratories (RL) is highly desirable to provide real-time online practical training to students.

The InnoVative Engineering Solutions e-Learning (e-LIVES) Project is intended to help overcome the problem faced by the Southern Mediterranean countries and assist in the challenge of developing e-engineering courses and developing and implementing remote laboratories that can be used by students in these courses.

Nowadays, there are remote laboratories for practical work in various fields of engineering, although most of them have certain disadvantages or limitations. One of the laboratories at the top of the state of the art of remote laboratories for wiring and measuring electrical and electronic circuits is the VISIR remote laboratory. Given the extensive trajectory of this laboratory, as well as its significance in the world of remote laboratories, this article presents the results of the adaptation of the practical resources developed within the e-LIVES project for the use of VISIR. A comparison between this laboratory and the remote laboratories developed within the e-LIVES project made it possible to detect some advantages and disadvantages of both laboratories.

2. e-LIVES project

2.1. Project Description

The e-Learning InnoVative Engineering Solutions (e-LIVES) Project is part of the Erasmus+ Capacity Building in Higher Education call. Its main objective is to help universities in partner countries to be able to develop e-learning courses in engineering in an autonomous and sustainable way. In this way, it aims to contribute to the modernization of the training program in southern Mediterranean countries (Morocco, Tunisia, Algeria and Jordan), where the number of students has more than doubled in 15 years (Thati et al., 2019).

To this end, there are two main objectives within the project: 1) to assist universities in the partner countries in all stages of the e-engineering course design and development process, and 2) to help universities in the partner countries to develop their own remote laboratory.

2.2. Partners

The e-LIVES project is coordinated by the Université de Limoges, and involves 4 European universities (Université de Limoges in France, Instituto Politécnico Do Porto in Portugal, Katholieke Universiteit Leuven in Belgium and Universidad Nacional de Educación a Distancia in Spain), 1 company (LabsLand Experimentia SL in Spain), 1 association as an associated partner (International Association of Online Engineering), and 9 universities from the partner countries, Morocco, Tunisia, Algeria and Jordan (Université Cadi Ayyad in Morocco, Université Abdelmalek Essaadi in Morocco, Université Virtuelle de Tunis in Tunisia, University of Kairouan in Tunisia, Université de Mostaganem in Algeria, Université du 8 Mai 1945 Guelma in Algeria, Université Badji Mokhtar de Annaba in Algeria, Princess Sumaya University for Technology in Jordan and Tafila Technical University in Jordan).

2.3. Specific Objectives of the Project

The specific objectives to be achieved by the e-LIVES project are the following:

- To carry out the identification of best practices in the development of high-quality training programmes in e-engineering training.
- To carry out the development of remote laboratory solutions that are reliable and accessible online 24 hours a day, 7 days a week.
- To carry out the development of practical and open training for the staff of Southern Mediterranean universities.
- To carry out the control and evaluation of the pedagogical innovation solutions used.
- Dissemination of the e-engineering concept in the Southern Mediterranean countries, mainly through national dissemination workshops in the different partner countries of the project.

2.4. UNED and E-engineering Practical Resources Adaptation for the Use of VISIR

The Spanish National University of Distance Education (UNED) is one of the partners of this project. The UNED is the largest university in Spain, with more than 250,000 students and almost 50 years of experience in distance education. This has meant that the UNED, and specifically the Electrical and Computer Engineering Department (DIEECTQAI) of the School of Industrial Engineering involved in this project, has extensive experience in the delivery of e-engineering courses and in the development of remote laboratories such as VISIR (Virtual Instruments System In Reality), a remote laboratory at the top of the state of the art of remote laboratories for the wiring and measurement of electrical and electronic circuits.

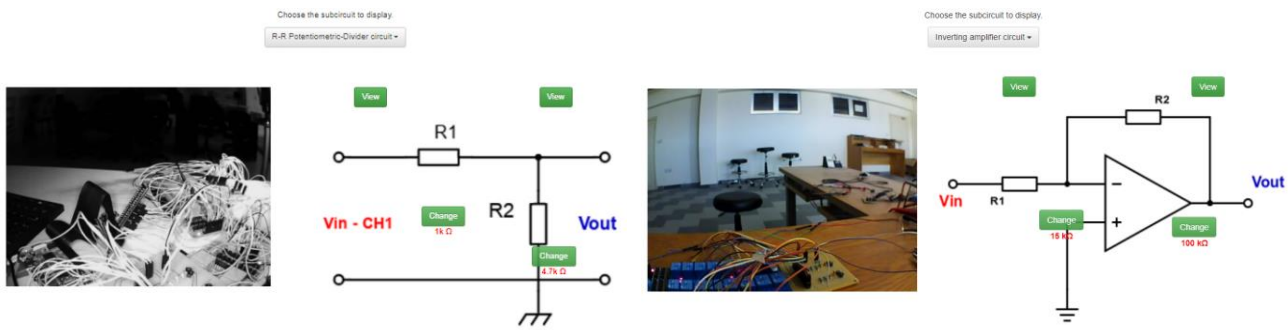
Given the extensive experience of the UNED in distance learning and remote laboratories and its expertise working with VISIR, it has decided to carry out the adaptation of the e-engineering courses developed in the project for their implementation with VISIR. Thus, a comparison between both solutions has been carried out and the advantages and disadvantages of both laboratories have been found, as well as the possible improvements that could be made in the remote laboratory developed within the project.

The article is organised as follows. Sections 3 and 4 present the remote laboratory developed within the e-LIVES project and the VISIR laboratory, respectively. The adaptation of the e-engineering practical resources carried out by the UNED is presented in Section 5, while Section 6 carries out a comparison between both laboratories, highlighting the advantages and disadvantages present in each of them, and some possible improvements that could be carried out in the future to improve the laboratory developed in the project. Finally, Section 7 presents the conclusions.

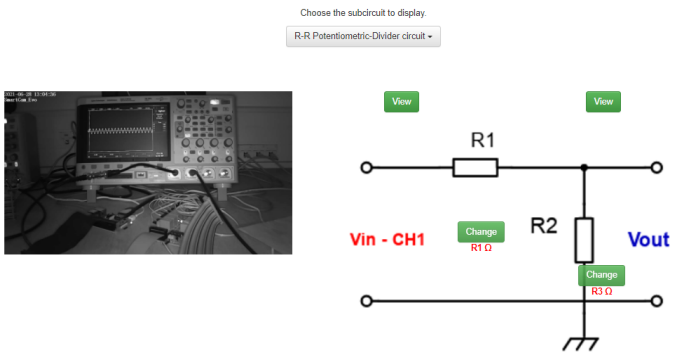
3. e-LIVES Remote Laboratory

As mentioned in the previous section, one of the main objectives of the project is the development of remote laboratories that offer proper reliability and are remotely accessible 24 hours a day, 7 days a week. Specifically, within the framework of the project, two remote laboratories have been developed, one for practical training with RLC circuits (RLC Lab) and the other for working with operational amplifiers (OpAmp Lab). However, following cost-effective e-LIVES architecture, multiple remote labs solutions can be implemented focusing on different topics such as rectifiers, active filters, etc. These laboratories allow users to remotely interact with a real lab, thus obtaining real measurements on a series of RLC and OpAmp circuits. Each lab offers the user the possibility to choose from a number of pre-designed circuits, and to select the value of resistors, capacitors, and inductors from a list of possible values. In addition, the user has the possibility to modify the voltage applied as well as the functions generated with the function generator. Finally, the user can interact remotely with an oscilloscope to analyse the real behaviour of the circuit. At the same time, the user can visualise the remote laboratory's components in real time by means of a camera.

The two remote laboratories developed in the project have been implemented in each of the different participating universities in the Southern Mediterranean partner countries (Morocco, Tunisia, Algeria, and Jordan) with the help of the other project partners. Therefore, there are 9 replicas in total of both laboratories. Figure 1 shows some images of the RLC and OpAmp laboratories replicated in several universities.



a) b)



c)

Figure 1. Images of the RLC and OpAmp remote laboratories developed in the e-LIVES project replicated in several universities. a) RLC RL at Princess Sumaya University for Technology. b) OpAmp RL at Tafila Technical University. c) RLC RL at University of Kairouan.

3.1. e-LIVES RL Hardware description

Both e-LIVES remote labs, the RLC RL and the OpAmp RL, are composed of the same hardware components, except for the practical work (PW) board, on which the specific circuit is printed and the components of each remote lab are connected. This provides a great advantage to this remote lab, as its architecture is easy to adapt to other similar remote labs with other types of circuits.

The main hardware components that integrate the e-LIVES remote laboratories are:

- Relay Switch board
- RLC/OpAmp PW board
- Main server
- Single Board Computer (SBC)
- Oscilloscope
- Function Generator
- Power supply

The Relay Switch board allows different circuit designs to be configured on the PW boards by setting the corresponding relay status. The PW board in each remote laboratory is designed in such a way that, by activating and deactivating different relays, different circuit designs can be configured and different component values can be used. The design of the PW boards also allows a large number of different component values to be used, obtaining new values by connecting different components in series and parallel, depending on the configuration of the relays. These configurations are previously defined for the different types of circuits available for each remote laboratory, using the SBC, which in this case is a Raspberry Pi 3.

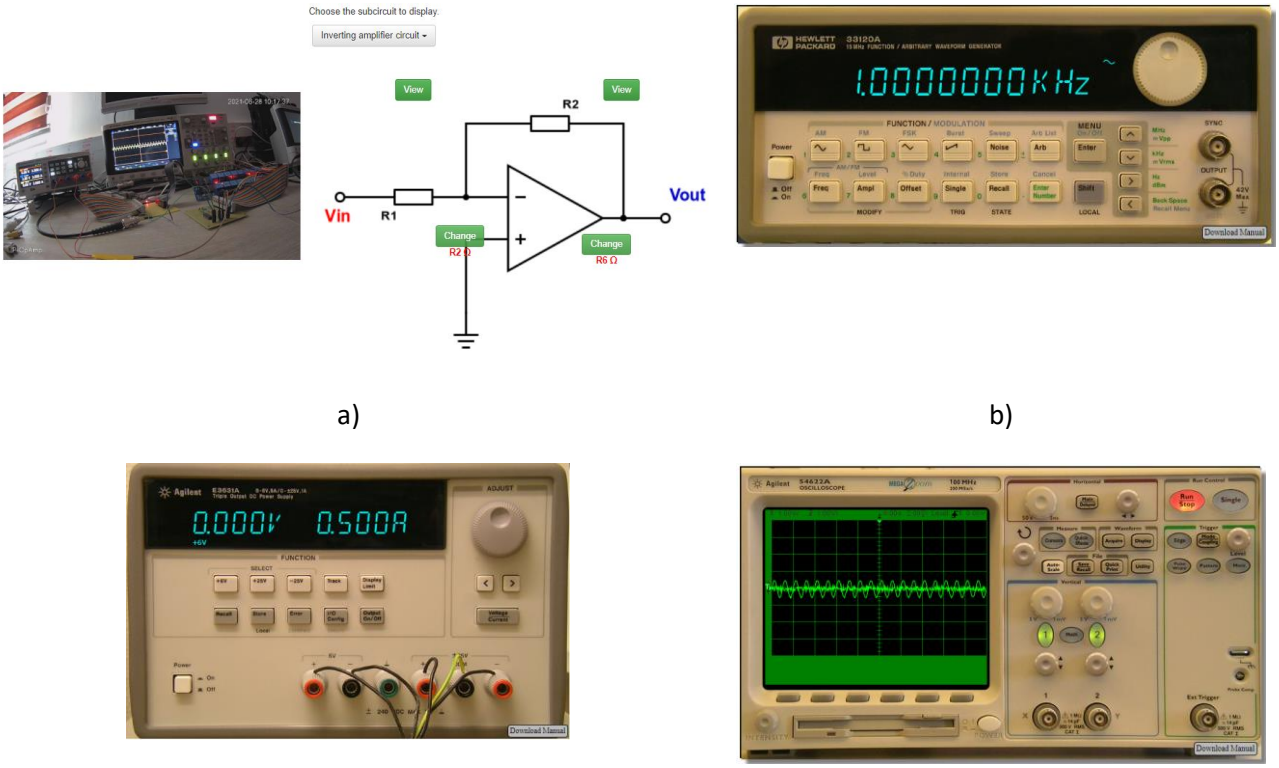
The PW boards are also connected to the instruments, which are at the same time connected to a network to which the Main Server and the SBC are also connected, allowing the user to interact with all of them, and ultimately with the remote laboratory itself.

3.2. e-LIVES RL Software description

The e-LIVES remote laboratories allow users to interact with them through a user interface that is accessed via the internet. The configured servers allow the user to interact with the remote laboratory by sending and receiving requests via the user interface.

In this way, when the user selects the specific design to be used in the remote laboratory, as well as the values of the components of this circuit, the server manages this request and the SBC sends the configuration of the relays to the Relay Switch Board, thus generating the specified circuit together with the PW board of the remote laboratory in use. On the other hand, the user can also interact via the graphical interface with a simulation of a power supply and a function generator. The server manages the requests and thus controls the real instruments in the remote laboratory. The server also manages the information received by the real oscilloscope equipment, and provides this information to the user via the simulated graphical interface of this oscilloscope. The user can also modify the configuration of the oscilloscope by interacting with the simulated oscilloscope in the interface.

Figure 2 shows different images of the interface. The user can visualise the schematic design of the circuit selected for the experiments, as well as select from a drop-down menu the value of the components from a list of possible values (Figure 2 a)). At the same time, the user can see in real time an image of the installed physical remote laboratory. Figure 2 b) c) y d) show the visualisation of the function generator, the power source, and the oscilloscope respectively. As can be seen, the simulation is very similar to that of the real instruments.



a) b)

c) d)

Figure 2. Different images of the e-LIVES RL interface. a) Schematic circuit and real time image of the installed physical remote lab (University of Kairouan OpAmp RL). b) Function generator. c) Power supply. d) Oscilloscope.

4. VISIR Remote Laboratory

VISIR (Virtual Instruments System In Reality) is a remote laboratory for wiring and measuring electronic circuits that is one of the top state-of-the-art laboratories in this field. In fact, this remote laboratory is considered one of the best existing remote laboratories, as demonstrated by the award received by the Global Online

Laboratory Consortium (GOLC) for the best remote laboratory received in 2015, this being the first time that this distinction was awarded (Gustavsson et al., 2016)

The VISIR project was initiated by Professor Ingvar Gustavsson in 2006 at the Department of Signal Processing of the Blekinge Institute of Technology (BTH), Sweden, whose initiative emerged from a remote laboratory project originated at BTH in 1999 (Gustavsson et al., 2007). This project arose from the cooperation of BTH with National Instruments and Axiom EduTech and financial support from VINNOA (Swedish Governmental Agency for INnovation Systems).

The VISIR lab implements a replica of a traditional analogue electronic hands-on lab in a virtual environment that replicates conventional physical breadboards, which can be accessed from anywhere. This lab provides great flexibility to users, as it is possible to build different circuits on a virtual breadboard using a wide variety of electronic components and perform measurements on it. This is a unique feature that distinguishes VISIR from other remote laboratories (Tawfik, Sancristobal, et al., 2013). Another distinctive feature of VISIR is that it is a multi-user laboratory, allowing the mounting and wiring of different circuits as well as the interaction with the different instruments of up to 60 users simultaneously (F Garcia-Loro et al., 2020).

Since the development of this laboratory, a large number of units have been deployed and installed in different institutions and countries, with more than 20 VISIR laboratories in operation today (F Garcia-Loro et al., 2020). These labs are used by thousands of students around the world (Gustavsson et al., 2016). In fact, VISIR has been used in the delivery of different courses, under different scenarios and educational levels, showing its great usefulness, reliability and flexibility (Alves et al., 2012; Blazquez-Merino et al., 2020; Dziabenko et al., 2013; Felix Garcia-Loro et al., 2018; Gustavsson et al., 2016; Loro et al., 2018; Tawfik, Monteso, et al., 2013).

One of the VISIR laboratories that have been deployed is the one installed at the National University for Distance Education in Spain (UNED), partner of the e-LIVES project, whose laboratory has been used in this work to carry out the adaptation of the educational resources developed in the project and the comparison with the remote laboratory implemented.

A description of both the hardware and software part of the VISIR laboratory is given in the next paragraphs. This laboratory has been described in detail in numerous articles (Gustavsson et al., 2007, 2008; Tawfik, Sancristobal, et al., 2013), so here we will simply provide a brief description of it.

4.1. VISIR Hardware Description

The VISIR remote laboratory is composed of two main hardware systems: the instrumentation platform and the relay switching matrix.

The instrumentation platform is based on the NI (National Instruments) PXI platform. This platform is composed of a chassis to which different cards are connected: a controller card, and different instrument module cards. The latter include a DC power supply, a function generator, a multimeter and an oscilloscope.

The relay switching matrix is a stack of boards responsible for controlling the connections made between the instrumentation platform modules and the components inserted in them. These boards are manufactured at BTH, and there are two different types: instrument boards and components boards. This stack of boards is the one that makes it possible, from the components and instruments available, to build different circuits and carry out measurements on them.

Figure 3 shows the two hardware elements of the VISIR laboratory currently installed at UNED.

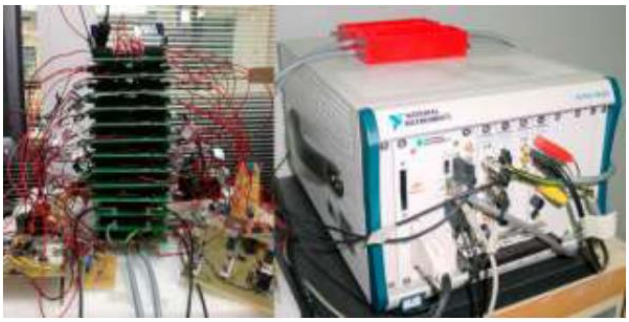


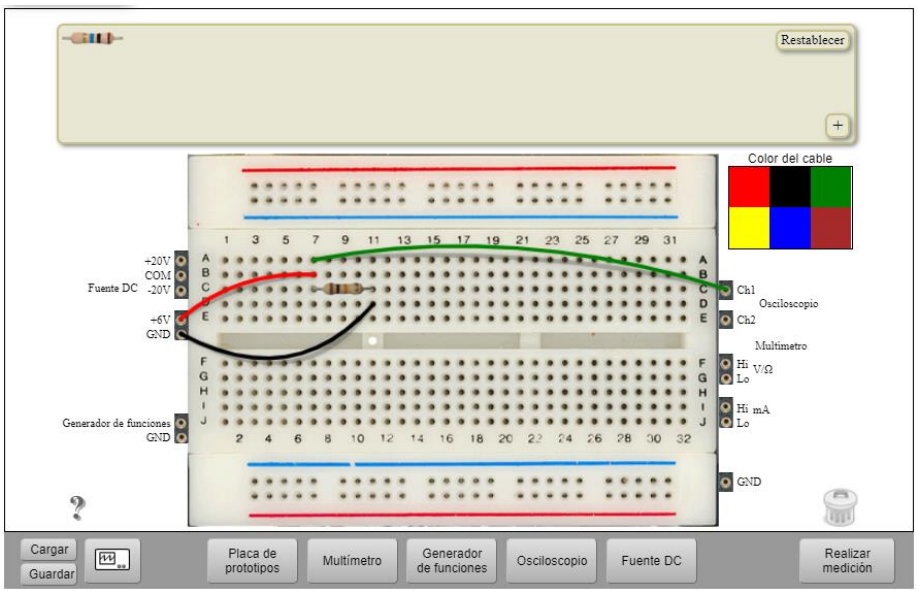
Figure 3. Hardware elements of the VISIR laboratory installed at UNED (F Garcia-Loro et al., 2020). Left) Relay switching matrix. Right) PXI chassis with the diverse measuring instruments and equipment cards from National Instruments.

4.2. VISIR Software Description

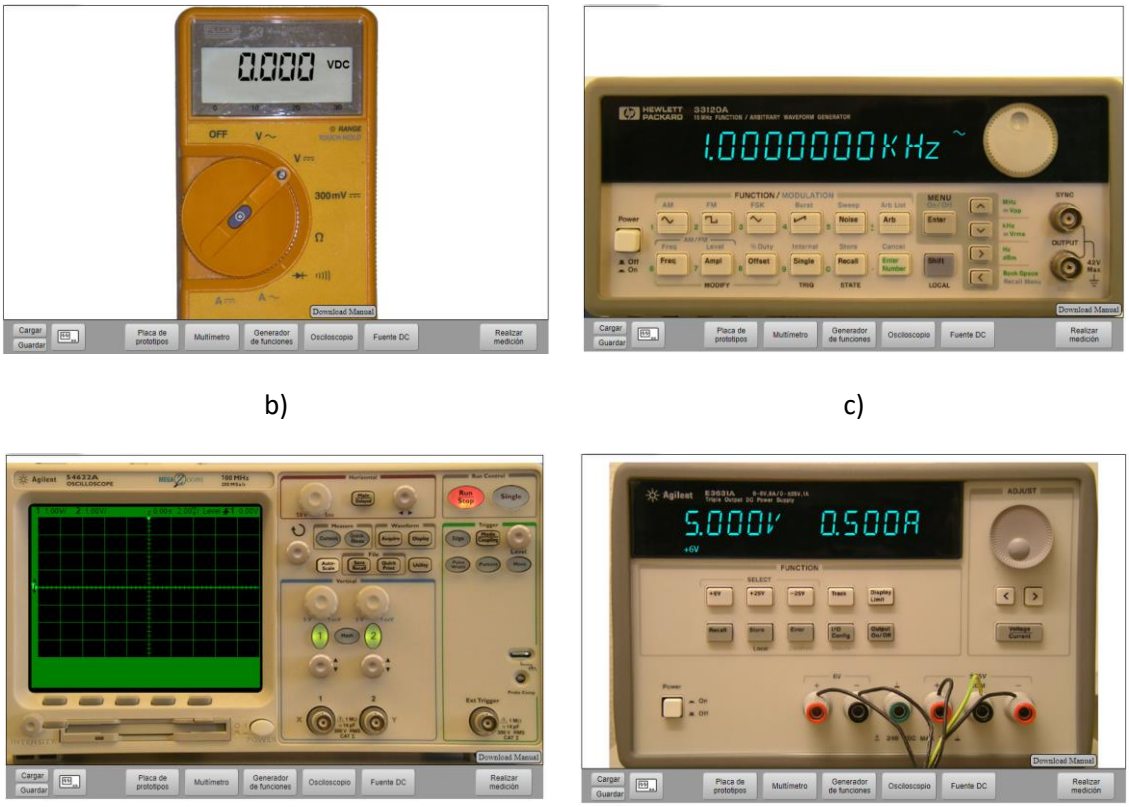
VISIR software can be divided into three main elements:

Experiment client

This is a simulated workspace through which the user interacts with the remote laboratory. Here, the user chooses the components he/she wants to use from those available, assembles and wires the desired circuit on a breadboard, and visualises and interacts with the different instruments in the laboratory. Figure 4 shows this simulated working environment, including the breadboard, multimeter, function generator, oscilloscope, and DC power supply. Once the wiring is done and the different instruments are configured, the Experiment Client sends a request for the experiment to the Measurement Server, which then sends back to the Experiment Client the information to be displayed to the user through the interface.



a)



b) c)

d) e)

Figure 4. Graphical interface of the different VISIR equipment and instruments. a) Component tray and breadboard with an example circuit assembled, b) Multimeter, c) Function generator, d) Oscilloscope and e) DC power supply.

Measurement server

This server is responsible for receiving requests from the Experiment Client and, once the request has been processed, sending the experiment response to users through the Experiment Client interface. Once the request has been received, the Measurement Server carries out the following steps: client authentication verification; verification of the circuit entered by the user to check if it is a valid experiment (established by means of max files); management of the queue of different simultaneous requests; and sending the previously validated requests to the Equipment server.

Equipment server

This is the software in charge of controlling the VISIR remote laboratory hardware, both the instrumentation platform and the relay switching matrix. This server receives user requests previously validated by the Measurement Server and executes them through the connected instruments. The results obtained are finally represented visually by means of the simulated instruments represented in the graphic interface.

5. e-Engineering practical courses

As previously mentioned, one of the two main objectives of the project is to assist universities in the partner countries in all stages of the design and development process of e-engineering courses, including the development of some e-engineering courses. In these courses, students can use the remote laboratories also developed in the project, thus reinforcing the theoretical knowledge acquired.

The aim of this study was to analyse the feasibility of adapting these courses for use with the VISIR remote laboratory, comparing both solutions and highlighting the advantages and disadvantages of using VISIR instead of the remote laboratories implemented by the universities in the partner countries of the project.

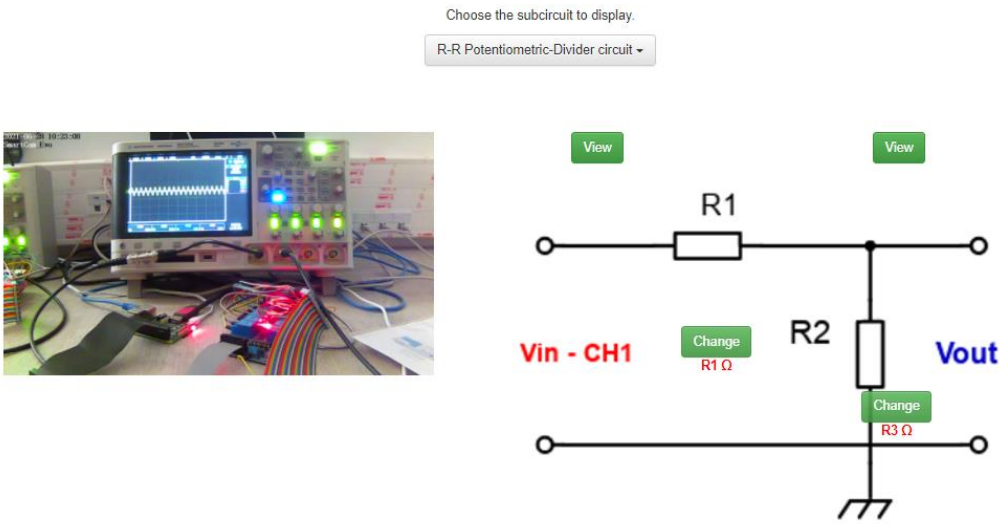
5.1. e-LIVES courses to VISIR adaptation

For the adaptation of the courses, different circuits of the course have been implemented using VISIR.

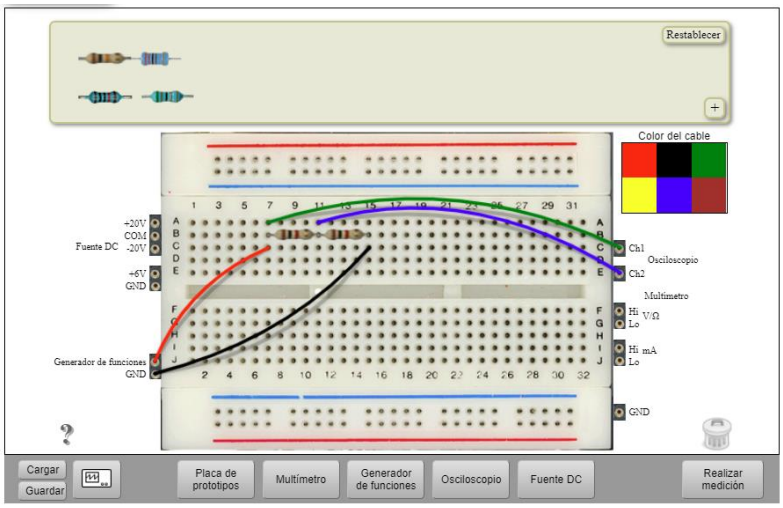
It should be noted that some of the circuits implemented in the courses may not be built due to the current configuration of the VISIR relay switching matrix, or that the component values may not be the same as the possible values offered by e-LIVES RL. However, these could be modified in the future if necessary. For the adaptation with VISIR, different possible configurations of the components that the user could use to build each circuit have been studied, and have been indicated in the document, so that the user may be able to perform experiments with different values of the components.

When adapting the practical resources, it must be taken into account that in the case of VISIR the circuits are not previously implemented as is the case with e-LIVES RL. Therefore, these resources must be adapted so that the user is first able to build the circuit to be used in the practical training. This requires more advanced knowledge and provides additional skills, but can also interfere with the direct benefits of experimentation with real systems. For the practical training with VISIR, the practical resources include instructions on the connections that the user must make to assemble and wire the circuit and connect the instruments, as well as an image of a possible assembly of the circuit implemented in VISIR. Figure 5 shows an example of one of the possible RLC e-LIVES RL circuits and a possible implementation of this circuit using VISIR.

Once the practical resources of e-LIVES have been adapted for use with VISIR, a comparative study has been carried out between the two remote labs, pointing out the advantages and disadvantages offered by each of them.



a)



b)

Figure 5. e-LIVES practical resources adaptation for the use of VISIR. R-R Potentiometric Divider circuit implemented in a) e-LIVES RLC RL (University of Kairouan) and b) VISIR.

6. Remote Laboratories Comparison

This section presents the results of the comparative analysis carried out between the remote laboratory developed in the e-LIVES project and VISIR.

Regarding the assembly and wiring of the circuits, in e-LIVES RL, the circuit designs are already implemented in advance, so students can only choose the values of resistors, capacitors and inductors from a list of possible options, but they do not have to carry out the assembly and wiring of the circuit. Therefore, students do not acquire experience in the process of assembling circuits in a real laboratory. However, VISIR users can experience the process of assembling and wiring circuits in a similar way as they would in a regular laboratory. Thus, they are confronted in a more similar way to the problems they might encounter in a regular practice lab, such as component selection and placement, wiring on the breadboard, faulty connections, failures, etc. However, while this provides additional skills, it also requires more advanced knowledge and can hinder the direct benefits of experimentation with real systems.

In terms of interface, both labs have a similar interface in terms of visualisation and interaction with the different instruments (e.g., the oscilloscope). In both cases, the appearance of the simulation presented by these instruments is very similar to the appearance of the real instruments, which makes the user experience when using them much closer to the experience using a hands-on laboratory. However, there are differences in terms of the interface corresponding to the design and assembly of circuits in a real laboratory. In the case of the VISIR lab, it provides a simulation of a workbench with a simulated breadboard, where the user can assemble the circuits just like in a real lab. However, the e-LIVES RL does not have this simulated breadboard, but rather the previously designed circuits are shown directly to the user as static images of a schematic in which the user can select the value of the components he/she wants to use. This can make users feel more like they are working with a simulation software rather than a real lab. In addition, when dealing with practice in a real environment, the user may not be able to identify the elements of the circuit, such as the breadboard and components like resistors, wires, and capacitors.

As regards measurement, with VISIR the student, apart from using the oscilloscope, can also use a multimeter. Moreover, the student has to deal with the issue of the connection between the circuit (breadboard) and these

instruments to be able to perform the measurements, as if it were a real practical laboratory. However, in the e-LIVES remote laboratories, the student can only make measurements with an oscilloscope, which is previously connected to specific points for each experiment, so that the students do not acquire any knowledge of this part of the use of measuring equipment. In addition, as mentioned above, the oscilloscope channel connections are pre-connected at specific positions in the circuit for each experiment, which means that the students cannot make measurements in other areas of the circuit that might be of interest to them.

Compared to other remote laboratories in general, the major advantage of VISIR is that it allows several users to perform different experiments at the same time, carrying out real assemblies of different circuits with the same or different elements, and obtaining real measurements. VISIR has a multiplexing system that allows the connection of up to 60 users at the same time. (F Garcia-Loro et al., 2020). This creates the illusion that there are multiple VISIR labs. However, e-LIVES labs allow only one person to connect to the remote lab at a time. If other people try to access the lab when it is in use, a queue management system is used, which allows the other users to wait until the users ahead of them have finished using the lab. Since the same user can spend up to 1800 seconds (i.e., 30 minutes) using the remote lab before the session ends, the waiting times can be excessively high, which is a major drawback.

The price of VISIR is very high compared to the price of e-LIVES remote labs, plus it requires a LabVIEW license. If the price is divided by the number of students, since VISIR allows the connection of up to 60 students at a time, the price per user decreases significantly (García-Zubía et al., 2011). However, this requires a very large initial investment, so it may not be interesting when the number of students is not very high.

VISIR allows a wider variety of different types of experiments to be carried out. However, the e-LIVES laboratories have been developed with the objective of performing various RLC and operational amplifier experiments, which can offer more variety within these specific types of experiments. Moreover, several remote labs solutions could be implemented focusing on different topics following cost-effective e-LIVES architecture.

Finally, in certain cases, when testing by varying the components, we may have small errors in the VISIR measurements that do not occur in the e-LIVES labs. This is because depending on the components that are selected in VISIR, the path created to join both components may be longer, so there may be variations.

6.1. Potential Improvements of the e-LIVES Project

After analysing the performance of the remote laboratories developed within the e-LIVES project compared to the well-known VISIR laboratory, we propose a series of possible improvements that could be made in the future to improve the performance of these laboratories.

- As mentioned above, the e-LIVES RLs have a rigid interface regarding the assembly and wiring of the circuit, since the student cannot perform this assembly, but can only choose between different pre-designed circuits proposed. These pre-designed circuits are displayed on the interface as schematic designs, as in simulation software. This can cause that, although a camera shows in real time an image of the remote laboratory, the user does not perceive that he is working with a real remote equipment. Therefore, it would be interesting that, even if the user does not have the possibility to design, assemble and wire his own circuits on a breadboard, at least the interface shows real images of these circuits instead of just schematics, in order to bring the user closer to a real practice lab.

- Currently, e-LIVES laboratories do not allow simultaneous access to the same laboratory by several users at the same time. This, added to a maximum time per session of 1800 seconds can cause significant problems if the number of people wishing to access is very high, generating a queue with an excessive number of people. Therefore, it would be interesting to implement a solution to solve these problems.
    - One possible solution is the creation of a reservation system that allows users to reserve time slots to use the remote lab. This would still not allow more than one user to use the remote lab at the same time, but would at least allow better management of its use.
    - Another possible solution would be the federation of the 9 laboratories developed in the universities of the different partner countries of the project, in such a way that the system, independently of the user's home university, would allow the student to access another laboratory if the one in the home institution is occupied.
    - Finally, a possible improvement would be to manage the concurrency of users within the same remote laboratory. As with the VISIR laboratory, the fact that it is a very fast response, reaching steady state very quickly, this management would allow the user to not realize that there is a waiting time, and therefore it seems that he is getting the results in real time.

7. Conclusions and future work

In this work, the adaptation of the practical resources developed within the e-LIVES project has been carried out for use with the VISIR remote laboratory, considered to be at the top of the state of the art of remote laboratories. This has allowed to carry out a comparison between both remote laboratories, pointing out the advantages and disadvantages of both laboratories.

This analysis has made it possible to make a proposal for possible improvements that could be carried out in the future on the remote laboratories developed and implemented by the universities of the partner countries of the project.

About the interface, both labs have a similar interface in terms of visualisation and interaction with the different instruments (e.g., the oscilloscope, digital multimeter, function generator and power supply). This common approach simplifies the integration of both architectures, of both tools in the same educational environment. Therefore, potential synergies emerge between both lab systems which must be explored in the near future.

As a next stage, it is planned shortly to carry out a study with students to obtain data on the performance of practical courses using both laboratories, which will allow a comparison of both solutions from the students perspective.

8. Acknowledgments

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Enabling the digital leap: Pedagogical leaders transitioning from adopters to innovators in a digital learning ecosystem

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Abstract
Emergency eLearning" (Murphy, 2020, p.492), ushered in by the global pandemic, prompted educational leaders to support staff, students and parents in the transition to alternative modes of learning. Leaders provided pedagogical, technical and pastoral support which significantly increased the complexity of their role. (Fahey et al, 2020). Kilcoyne (2021) notes, that due to the crisis-prompted migration to online teaching and learning, "professional digital competence has been permanently reshaped" (p.4). Today more than ever, building teachers' digital capabilities, staff resilience and developing an integrated pedagogical model are viewed as key priorities for the sector.

Harris, (2020) argues that the pandemic has changed traditional approaches to educational leadership. Distributed and collaborative models are necessary so leaders can develop and leverage from networks to pool resources, and reduce the complexity that they experienced during the pandemic. Open leadership models that encourage collaboration with policy makers, technology providers, communities, parents, teachers, children, learning supports and professional organisations are critical (Harris, 2020).

This paper will explore the elements of a pedagogical digital leadership ecosystem necessary to provide an inter-dependent model to support educational leaders to succeed in post-covid era. It will consider the inter-relationship between digital policy, pedagogy, infrastructure, literacies, wellbeing, and inclusion (EDI) in the context of social innovation theories such as Rodgers Diffusion of Innovation Theory (1962). To date the education sector has largely been adopters of rather than innovators in the area of digital technologies, often using technology to replicate face-to-face practice rather than innovate. It is hypothesised that the proposed ecosystem will support educational leaders to progress from adopters to innovators influencing technology development, policy and pedagogical innovation and foster a sustainable, agile pedagogical model going forward.
Keywords: Digital education leadership, innovation, pedagogical leadership, digital learning

1. Introduction

Over the past year virtually all levels of education have had to adopt and exploit digital learning platforms and technologies to enable them to continue to support children, young adults and adults to learn. It is estimated that over 1.6 billion school going children worldwide have been affected by the pandemic. (UNESCO, 2020). Students experienced a learning loss due to lockdown, in particular those students in primary and lower secondary school (EC, 2020). It is also reported that the rapid transition to remote teaching and learning exacerbated existing educational equalities and impacted negatively on students' emotional wellbeing and motivation (EC, 2020). In Ireland alone 3, 240 primary schools with 37,839 staff and 559,365 students were effected (Fahey et al, 2020). Secondary schools have found it easier to adapt than primary schools as many had digital infrastructure with older children having some level of digital skills. Furthermore older children have the capacity to be self-directed and independent. Despite this, social isolation and concerns about state examinations were a major challenge.

Education leaders were central in supporting staff, students and parents in this transition, having to provide digital planning, technical and pastoral support. Due to the increasing complexity in their role, the wellbeing of education leaders has suffered (Fahey et al, 2020). However, despite the layers of complextity it brings, leaders recognise the importance of digital learning forming a daily part of learning and teaching. Such integration will foster resilience and digital capacity should education experience similar crisis' in the future. Therefore, education leaders need to be supported too in developing the skills required to plan a model of digital education that is sustainable for all.

Key to this is the development of a clear vision for digital learning and capacity building the in area of digital learning (Leithwood, Harris, and Hopkins 2020). Traditionally digital learning was identified as separate and optional element of education. Given the recent circumstances, digital learning needs to be reconsidered as an integral part of the educational system, not only focused on technology but policy, pedagogy, wellbeing, inclusion, digital literacies, equity as well as leadership and digital learning policy at national and international level.

Harris, (2020) argues that the pandemic has changed the traditional approaches to educational leadership. He highlights distributed and collaborative models as necessary so leaders can develop and leverage from networks to pool resources, alleviate stress and reduce the complexity that they experienced during the pandemic. Interdisciplinary approaches, e.g. working in partnership with communities, parents, teachers, children, professional development organistations and technology providers, on a national and global level is central. Furthermore, education leaders need to foster skills in change management, innovation, learning culture, digital literacies, digital inclusion, digital pedagogies and digital decision making and explore the inter-relationship between these (Harris, 2020). Such skills increase the complexity of the leadership role and as a consequence, education leaders, policy makers and teachers need to collectively develop distributed leadership approaches to ensure effective hybrid/digital learning environments (Fahey et al, 2020).

2. Innovation in education

To date innovation within the education sector has been largely incremental and had been limited to the use of digital technologies to enhance processes and learning in the sector. Where digital learning has been adopted in an innovative manner – early adopters have been commercial or private educational institutes that see the benefit in offering flexible approaches to education. Despite investment in sophisticated technologies, the private sector has not seen a significant uptake in their provision, and so public educational programmes

remain the preferred method of education. However, with the pandemic, many public educational institutes have been left little choice but to become 'late majority adopters' of mainstreaming digital learning and even then, such technologies have been introduced into education in a conservative manner (Rodgers, 2003) Incremental innovation is still prevalent in the public education sector. However, educators need to be encouraged to transition from late majority adopters to innovators to change mindset. Leaders need to be supported to take measured risks, become comfortable with uncertainty, experiment with technology while at the same time remaining aligned to the values that makes the public educational system attractive. (Rodgers, 2003).

So how do we encourage that transition? To ensure we align to educational leadership values, pedagogy needs to be central- however digital pedagogy is under theorised (Fyfe, 2011). Many pedagogical theories we rely on in a modern environment were developed in the mid-1900s and so individual pedagogical approaches need to be combined to respond to the demands of a modern education system (O'Sullivan and Ring 2020; Ring et al 2018). Furthermore, educational leaders, parents and students need to lead the way in digital learning innovation (Teräs and Teräs, 2020). It is critical that teachers and educational leaders avail of professional development opportunities aimed at developing digital competences across all ages (educators included) and teachers' pedagogical approaches for online, hyflex and blended models (EC, 2020). Currently, the majority of digital innovation occurs in business and are adopted by education e.g. Zoom (O' Sullivan, 2018; Serdyukov, 2017). This is partly because education has not yet considered what they want from digital learners and are followers rather than leaders, often using digital technologies to replicate face to face practice rather than enhance it. Therefore, leadership and digital planning is core to improving and sustaining best practice regarding education and learning in a digital era. This requires our educational leaders to influence policy, technology and innovation at national and international level.

The EU training and education monitor highlighted that less than half of teachers have received training on the pedagogical use of technology (EU 2020). Furthermore, many respondents emphasised the importance of collegiality and collaboration as key components to successful online educator learning prompting sustainable and innovative change in their teaching practices (DuBois et al., 2019; Hoffman, 2019; Salmon & Wright, 2014). This illustrates the need for open, distributed and connected leadership approaches for educational leaders and an integrated approach to digital learning leadership

Despite growing up in a digital economy, 30% of children have not developed basic digital skills (EU 2020). Therefore regular use of digital technologies is necessary to build resilience and digital capacity should the sector experience similar crisis' in the future. (Fahey et al, 2020) The next section will discuss an integrated ecosystem to leading digital learning going forward.

3. An ecosystem for digital leadership in education

The ecosystem (figure 1) argues that an integrated approach to digital leadership in educaiton is required. It encourages critical interrogation of technology in the context of policy, equality, pedagogy, literacy, leadership models and the required infastructure to support such an ecosystem. It highlights the need for a digital learning conduit that encourages educaitonal leaders across the education sector from early childhood to higher and futher educaiton and lifelong learning to consider the skills (digital, pedagogical, social, affective and cognitive) that they require to become the 'expert learner' (CAST 2017). Leaders should all build towards the same goal

in a cohesive manner and identifying challenges along the way. The ecoystem consists of six inter-related elements.

Figure 1: An Ecosystem for Digital Leadership in Education

The **policy** of learning in a 21st century educational system is a necessity to promote advancement in the field. Leaders need to explore the necessary components required to apply such policy in practice, they need to explore the inter-relationship and dependencies between each component. Furthermore, reflecting on their collective experiences in cross educational communities and considering how to effectively integrate the various elements of the ecosystem develop a vision and digital strategy for the educational system as a whole. Leaders should seek to influence policy so it is more closely related to practice. Furthermore leaders should consider communicating their vision to technology leaders so as to influence digital innovation and should encourage such organisations to adopt a partnership approach to development.

The policy element cannot be considered in isolation and through **Equality Diversity and Inclusion,** leaders need to respect the various individuals within the digital learning ecosystem and the educational community as a whole, and who is included and excluded in a digital education era. Leaders should reflect on their own values and biases and how this impacts on how they interact, communicate, teach and lead in their school environment. They need to explore the impact of digital ethics, digital poverty and the digital divide, social inclusion, considering those with learning needs. These challenges should be shared widely and practical limitations for various stakeholders should be openly discussed with other leaders, technology companies and policy leaders. They should be considered across all levels of education so cohesive solutions are developed

To meet the needs of the educational community **Pedagogical** theories need to be critiquied in the context of their relevance in a digital age. The role of the teacher and the student in a digital learning environment need to be interrogated and how teaching, learning and assessment can be supported through digital learning mediums. Furthermore leaders beliefs ragarding digital technologies need to be challenged and how it informs

their pedagogical use of technologies for teaching, learning and assessment. Leaders and teachers should become peagogical innovators and be given the time and space to reflect, refine and adapt their appraoches..

Education is often conservative in its appproach which has led to traditional approaches to **leadership**. However, from the pandemic it is clear that open innovation and open approaches are necessary in a complex society. The ecosystem advocates an open and connected (e)leadership as an approach to managing change, innovation and crisis. In addition it encourages interdisciplinary approaches to leadership and stakeholder collaboration in particular connecting with communities, parents, technology companies. It is important to leverage from the concepts of open innovation that are harnessed in several industries and for leaders to work in partnership.

To support students, educators and leaders to succeed, we need to provide them with the skills, **literacies** and competencies. In additon to digital literacies, other competencies include learning, social and emotional literacies in a digital and hybrid context need to be considered to support teachers and learners to humanise the experience.

This needs to be supported by the relevant **infastructure** including hardware, software and applications required to support digital pedagogies, literacies, inclusion and wellbeing. Leaders need to be provided with the skills to support them in making decisions about their digital learning infrastructure, procuring resources, innovative use of such technologies and the evaluation of such infrastructure in the context of whole school evaluation. Encouraging the use of infastructure in innovative ways and for multiple purposes to maximise return on investment is key. Furthermore, leaders need to critically evaluate infastructure and influence research and innovation in the field of digital learning technologies.

The ecosystem poses an integrated proactive approach that pitches leaders as innovators and encourages them to ampilfiy their vocies of experience in order to influence, policy, pedagogy, technology and inclusive educational systems. Such inclusive educational systems, anchored in principles which promote quality, equity, inclusion, innovation , digital readiness and success for all, support learners and educational communities to develop the literacies they need to become collaborative ‘expert learners’. The next section will explore some recommendations for enabling such.

4. Conclusions

Future demands on education will increase the complexity of the leadershop role. An integrated approach to sustained digital leadership in education requires constant interrogation, communiation and an open and collaborative approach. To ensure the success of an ecosystem, all individuals in the education community need to be considered as leaders and must be given an equal voice. They need to be proactively promoted as innovators in their field. Below are some recommendations to support this.

- Time and space for reflection and interrogation – less emphasis on perfection and systems and more emphasis on measured ‘risk taking’. An openess to the whole educational community is a key enabling factor while working towards a more sustained enhanced educational system fostering lifelong learning and mobility.
- A research leadership forum which supports teachers to avail of secondments for research leave to facilitate teachers to actively research their practice and use evidence based teaching approaches. In addition this will bridge the theory-practice divide, intensify the exchange of best practice and support teachers and leaders to inform theory to foster high quality, high performing and inclusive digital education.

- Including students in the leadership process and encouraging them to identify areas for improvement working in partnership with teachers, leaders and other community stakeholders to develop learning solutions. Learners can not only develop skills, competencies and literacies through this process but also take ownership of their learning moving them closer to becoming an expert learner.
- Supporting initial teacher education, induction and continuous professional development at all levels, ensuring the development of basic and advanced digital competences and innovative pedagogies, including ensuring that teacher education addresses teachers' competences to teach in digital environments.
- Establishing an agenda for Higher Education, with a focus on inclusion, innovation, connectivity and digital readiness.

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Monitoring Greece's teachers opinion for Distance Learning in Covid-19 era.

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Abstract
Methods of Distance Education have been used for decades in Higher Education, mostly by Open Universities, but also by traditional ones. As a result, the field of Distance Education has been extensively studied by researchers. The Covid-19 pandemic has led to the suspension of face-to-face lessons, in educational units of all levels, and teaching has been done exclusively via Internet for a long period of time. Teachers and students, of every level of education, were called upon to adapt quickly to the new situation. It is essential to study how Distance Education performed in Secondary level, as many of these students is possible to enrol in Higher Education institutions during the next few years.
In this context, we carried out a survey in order to record Greek teachers' opinion about the results and the efficiency of Distance Learning in Secondary Education and the difficulties they faced during the lockdowns caused by the pandemic of Covid-19. At the end of the survey, teachers made suggestions concerning the improvement of Distance Learning conditions in Greece's secondary education. The survey was conducted, from 17/4/2021 to 6/5/2021, and 411 teachers, took part. The results showed that teachers were not satisfied with the Ministry of Education and Religion Affairs, in terms of its preparation, while they would like its active contribution in their relevant training, as well as, the provision of subsidies in order to purchase the required equipment. Finally, teachers consider that online learning does not have equivalent results, compared to face-to-face learning.

Keywords: Pandemic, distance learning, response measures.

1. Introduction

Distance education is the education that is assisted by means of communication and is characterized by the minimal contact between the trainee and the trainer (Cleveland-Innes & Garrison, 2010; Anderson & Dron, 2011). These means of communication could be mail, e-mail, radio, television and nowadays the internet and its applications. Many ways of distance education had been developed such as distance learning, online learning and online education, which all have in common the internet and the computer (Cleveland-Innes & Garrison, 2010). The two main categories (Keegan, 2016) that distance education is separated are: synchronous and asynchronous education. In synchronous education teaching and learning take place at the same time, the teacher delivers the lesson which is attended by the trainee (who can be in any place). In

asynchronous education, the trainee can also be in any place, but the lesson is delivered by the teacher in a way that the trainee can watch it at any time.

The spread of the Covid-19 pandemic was rapid and the first cases in Greece occurred on February 2020, initially from travellers coming back from Italy, which was a major source of the virus in Europe at this time. During the first days of March, in a storm of measures against the spread of the pandemic, the Greek government and the Ministry of Education and Religion Affairs (from now on Ministry) suspended face-to-face teaching in all levels of education and urgently adopted distance education. Teachers in order to meet the government's goal implemented their training from previous years in new technologies in everyday practice, applying distance learning procedures.

Distance education was accompanied by supportive actions and presented significant differences, but also similarities among countries. The way that each country dealt with the supportive actions had a huge impact on the social inequalities. In many cases poor people or people living in undeveloped areas had significant difficulties keeping up with distance learning education.

Figure 1. Time of closure around the world (retrieved from UNESCO).

In Japan (MEXT, 2020) they provided financial support so that each school has the staff and the material to ensure effective learning spending about 828 million Euros. Moreover, they adopted specific principles: children must continue to learn regardless of the temporary closure of schools, the acquisition of knowledge must be done by all available means, the restart of schools must be done in the right steps wherever and whenever this possible etc. To achieve these principles, they redesigned the teaching structure, relocating some learning content for future teaching, breaks were shortened, classes were held on Saturday, school events were prioritized and preparation time was shortened throughout Japan.

In India (Protiva & Shivani, 2020) the treatment was different, given the economic size of the country, but also the cultural data. In recent years, the government of India has shown a shift towards digital education. However, there was not enough money to improve the digital infrastructure. Some of the initiatives undertaken by the State were: the development of an application with electronic content and video lectures, the digitization of all textbooks, the provision of 57,843 laptops, the use of TV channels, WhatsApp and SMS. Also, due to limited resources for education, they did not hire teachers, staff and non-teaching staff.

In Ireland (Mohan et al., 2020) in a very short time, teachers and students upgraded their digital skills, on their own initiative. Live web videos and virtual platforms were the first tools used for teaching. Many schools provided equipment to the students and it was clear that the schools by their own means tried to overcome the obstacles faced by some students. Special instructions have been published to support students who may not be able to attend live online lessons due to technical difficulties.

A report on Latin America and the Caribbean (UNESCO, 2020) found that the COVID-19 pandemic has exacerbated social inequalities and exclusion in education. Based on available data from 25 countries in the region, many of the measures that countries have adopted in response to the crisis were related to the suspension of face-to-face learning, which has led to three main areas of action: the development of distance learning through a variety of formats and platforms (with or without the use of technological means), the support and the mobilization of teaching staff and communities.

In Greece, during the first wave of pandemic, according to the Ministry of Education and Religious Affairs, the main effort was to retain contact among teachers and students. Lessons practically stopped, since students could not attend the class and their absence was not recorded. At the second wave, distance learning techniques have been applied in all schools in order to continue the learning process. Student's presence was obligated, their absence was recorded, homework was assigned and written exams were taken. Teachers evaluated students based on the online lessons and tests.

The necessity of online teaching has been highlighted in several cases. In Ireland (Mohan et al., 2020) since 2006 it was pointed out that schools need to develop plans to ensure that they are able to move to distance education "when disaster strikes" with two axes: first, the development of the necessary infrastructure, such as internet access, modern devices with appropriate software licenses and secondly offering appropriate training in Information and Communication Technologies to students and teachers. Uruguay had a government policy in place, which included the provision of electronic devices (laptops or tablets) to the school population (UNESCO, 2020). This difficult era provided an opportunity for the development of online learning (Nivedita et al., 2020). The experience from the pandemic of 2020, is possible to lead to new laws, regulations, platforms and solutions for future similar cases, helping governments and people to be more prepared than nowadays (Basilaia & Kvavadze, 2020; Carillo & Flores, 2020) highlighted the need for a comprehensive view of the pedagogy of online education that integrates technology in order to support teaching and learning.

In the present study a quantitative survey was conducted, employing 411 teachers of the secondary education in Greece. Teachers evaluated their effort as well as the Ministry's effort during the two total lockdowns of the secondary education in Greece. They were asked to compare the learning results of the online lessons with the face-to-face lessons, stating that students learned less during the Covid-19 era. Moreover, they needed more help from the Ministry by means of infrastructure and their education.

The paper is organized as follows: in section 2 we present distance learning in secondary education in Greece (before and during the pandemic of Covid-19), while in section 3 we present our research methodology, the statistical analysis and the results. At the end in section 4 we discuss the conclusions of our research.

2. Distance learning in secondary education in Greece

In Greece the main exponent of distance education is the Panhellenic School Network (P.S.N.), which started functioning in 1998. It is the national network of the Ministry and through it all schools are connected, providing many services. It is constantly evolving, but according to its users, there are many things to be done for its improvement and development. The most popular free educational content of software

management is Open e-class, created in March 2003 by the asynchronous distance learning team of the GUnet academic network, and used by many educational institutions in Greece.

These preceded the advent of the pandemic and often teachers were trained, not as they should be in a permanent form, to use these tools. Each teacher could have his own electronic class to work in asynchronous form with his students. A negative factor of the prosperity of all these supportive teaching methods is the lack of material infrastructure in most Greek schools.

In the Internet, educational material such as the interactive textbooks (e-books), the Digital Educational Material (Photo Tree) and Digital Educational Scenarios (Aesopos platform) all organized in levels of education (Kindergarten, Elementary, Gymnasium, General Lyceum) were well known to the teachers, pre-existed the Covid-19 era and could be used by teaching staff and students. Moreover, the platform Study4exams contains digital lessons and educational material for the students of third class of Lyceum, preparing them for the needed exams in order to enter the Universities.

On March of 2020 the Greek Ministry suspended the face-to-face operation of all its educational units to help prevent the transmission of the corona virus and had to move quick and efficient so as not to lose contact between teachers and students. It activated all the aforementioned digital tools and launched the Webex platform in order to create digital classrooms and continue the learning process. At first, many parameters were not taken into account and the main one was the possible lack of material infrastructure by teachers or students and its coverage. It became clear that Ministry should take proactive steps in order to deal with the difficult situation of pandemic, as many teachers and students did not yet have mail network connections. At the time, it was stated that the initial goal was not the teaching, but to continue the students' contact with their teachers.

Schools reopened on May 2020 and closed at the end of June for the summer vacations, with the intention to reorganize and gain a more efficient performance with the beginning of the new school year.

With the advent of the new school year, and while it did not seem to have changed anything mainly in the school infrastructure (better internet, more computers), the lessons started normally but the widespread of the virus forced the Ministry to stop face-to-face teaching and all return to the courses through the Webex platform with a different context, as the goal this time was to continue the learning process. Thus, on November of 2020, the teaching process started through the Webex platform, where attendance was now mandatory and absences were recorded normally. This form of education ceased to exist in Lyceums on April of 2021 when teaching returned to its natural space, the classrooms.

During all these months, many training programs on distance learning took place, mainly with initiatives of the local lesson coordinator and at the beginning of 2021 the implementation of a training program in mathematicians started by the Ministry, in collaboration with the University of Piraeus, which was later applied in general to the entire population of teachers.

3. The research

In order to investigate how secondary school teachers judge the evolution of distance education in Greece, a quantitative survey was conducted from 17/4/2021 to 6/5/2021. 411 teachers of the secondary education participated in the research, while for the selection of the sample no random sampling method was used, which means that it is a sample of convenience. Although this method does not provide the possibility of generalizing the conclusions, because no probabilistic sampling method was used (Creswell & Guetterman, 2019), it can provide useful conclusions in case the population has approximately the same characteristics as the sample (Blair et al., 2013).

The research questions were:

I. How familiar with distance learning methods Greek secondary education teachers are?
II. Which are teachers beliefs regarding State's support to them?
III. Which was the efficiency of distance learning?
IV. Are there any statistical significant differences related to teachers' demographics?

Regarding the demographics of the participants, 52.8% were men and 47.2% women. The majority of the participants answered that they were at least 51 years old. Specifically, 8 people (1.9%) reported being up to 30 years old, 48 people (11.7%) from 31 to 40 years old, 116 people (28.2%) from 41 to 50 years old and finally, 239 people (58.2%) reported that they were over 51 years old. The majority of the participants have extensive teaching experience in public secondary education. Specifically, 36.98% of the teachers (152 people) have more than 20 years of teaching experience, while the percentage of those who have 16 to 20 years (103 people, 25.06%) is also high. Most of the teachers teach in General Lyceum (56.94%), following by the ones who teach in Gymnasium (32.60%) and in Vocational Lyceum (10.46%). In order to examine whether there are differences in the answers, the area of the school unit in which the teachers serve is also taken into account. In 57.18% of the cases the school unit is located in Athens or Thessaloniki, while 18.98% in the capital of a prefecture except Athens or Thessaloniki and 23.84% in other parts of the country. Finally, teachers from 27 specialties participated in the research, which are grouped as shown in Table 1.

Table 1. Specialties of teachers.

Specialty	Frequency	Percentage
Literature teachers	32	7.8
Mathematicians	218	53
Physicists-Chemists-Biologists-Geologists	74	18
ITC teachers	23	5.6
Foreign languages	20	4.9
Other specialties of Gymnasium-Lyceum	33	8
Vocational Lyceum specialties	11	2.7
Total	411	100

To begin with, participants were then asked to indicate whether they had any contact with distance learning before March 2020. 59.6% answered negatively and 40.4% answered positively. Teachers which had a previous contact with distance learning (166 people) were also asked to answer how they had contacted with distance learning (having the opportunity to choose more than one option). 36.41% attended an Open University, 30.72% attended a relevant seminar or conference, while 21.69% hold a Master's degree in the field of Distance Learning.

Participants were then asked to choose some (not necessary one) of six proposals in order to describe what distance learning means to them. 67.15% agreed that it is the use of technology in teaching and 59.21% that it is the combination of synchronous and asynchronous teaching. Moreover, for 45.5% it is the physical distance of educational students, while for 29.2% it is characterized by the loss of the sense of belonging to a group. Finally, for 27%, the teacher in distance learning assumes the role of the facilitator in learning, while for 22.63%, the teaching practice is a support for the efforts for self-directed learning.

The next question concerned the level of use of the electronic class of P.S.N. for teaching before the occurrence of the pandemic, where 58.42% answered not at all, while only 7.18% answered that they used it frequently.

The next group of questions concerned the evaluation of the preparation of the Ministry, of schools, of teachers and of students regarding distance learning. Specifically, the above were evaluated for the period before the outbreak of the pandemic, the first period of the lockdown (March 2020), the period before the second lockdown (November 2020) and finally for this year's spring. The evaluation was done on a scale of 1 ("Not at all") to 5 ("Very much").

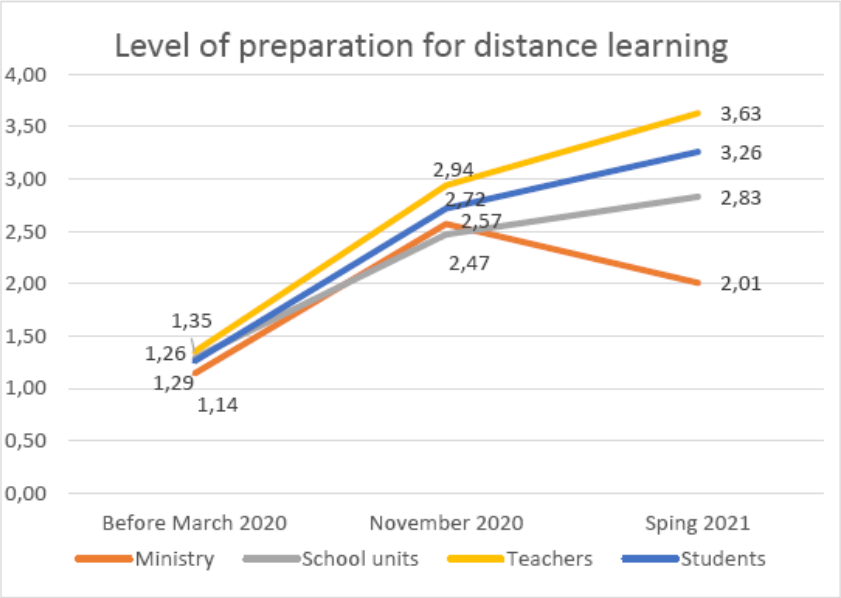

Figure 2. Evaluation of preparation for distance learning.

Figure 2 shows that for the period before March 2020, the evaluation of the Ministry, of schools, of teachers and of students was very low, below 2 in all cases, while it is characteristic that for the Ministry was a little above "Not at all" (1.14). For November 2020, and given everyone's previous experience, the picture is clearly improved, but no one was able to go above 3 ("Moderate"), although the teachers came close enough (2.94). What is worth mentioning is that while teachers and students, in the spring of 2020, are rated above "Moderate", the schools and the Ministry fail to reach this level.

Teachers were then asked to compare distance learning with face-to-face learning. It is clear to them that teaching from distance has not the same educational results compared to face-to-face teaching, since 71.53% chose "Not at all" or "A little" in the relevant proposal, while the percentage is higher (78.11%) to those who chose the same answer to whether it is possible to evaluate their students as effectively as in face-to-face teaching.

The following proposals concerned the impact of distance learning on both students and teachers. From table 2 it can be seen that in all the proposals concerning the possible benefits for the students, the average value is below 3 ("Moderate"). It is noted that the highest value appears in the sentence concerning the student's ability to learn how to learn, while the lowest value appears in the sentence concerning the coverage of students' educational needs. It is also noted that despite what is mentioned in the relevant literature, teachers do not seem to consider that the participation of students in distance learning provides them with skills that they will need in the future. As for the teachers, they consider that their participation in distance learning helps their professional development, but without providing them with useful skills, while at the same time it does not fully cover their needs for contact with their students.

Table 2. The effect of distance learning.

Distance learning...	Mean Value (MV)	Standard Deviation (SD)
… enhances the student's ability to learn how to learn	2.94	1.084
… equips students with skills they will need in the future	2.07	0.935
… is able to fully meet the educational needs of students	1.91	0.913
… is able to fully meet the needs of students for contact with the educational team	2.39	1.084
… requires students to spend the same amount of time preparing for face-to-face learning	2.80	1.124
… assists in the professional development of teachers	3.42	1.000
… equips teachers with useful skills	1.97	0.950
… is able to fully meet the needs of teachers for contact with their students	1.96	1.189

The next proposals concerned the educational results of distance learning. From Table 3 it is clear that teacher's satisfaction related to the students' participation during the lesson is slightly above "moderate". The level of knowledge acquisition is moderate, while the absences of students do not seem to have increased significantly. Finally, opinions are divided on whether it will be easy to return to normal.

Table 3. The consequences of distance learning.

Proposal	Mean Value (MV)	Standard Deviation (SD)
Satisfaction with student participation during the course in distance learning	3.40	1.020
Student absences have increased during the distance learning period	2.60	0.927
Easy return of the educational process to the normal state	2.96	1.193
Students have acquired the knowledge they should with distance learning	3.01	0.934
Readiness to participate in the final exams at the first class of Lyceum	2.48	0.815
This year's situation will affect the next school year	1.87	0.996
Distance learning has diversified the frequency of use of digital supervisory teaching aids to conduct the course	4.05	0.765

From Table 4 it can be seen that the biggest problem faced by the teachers was the correction of exercises, as well as the connection problems on the platform and on the internet. The use of the computer was the least problematic.

Table 4. The problems of distance education.

Problem	Mean Value (MV)	Standard Deviation (SD)
Connection on the platform and on the internet	2.75	1.048
Use of PC	1.80	0.971
Internet connection	2.57	1.135
Correction of exercises	2.84	1.267
Finding the right equipment	2.25	1.292
Finding the right digital teaching aids	2.30	1.146
Finding the right educational material	2.27	1.137

Regarding the source of the teaching material, 80.29% of the teachers created it themselves, while an important source was the internet (79.81%) and for 68.4% the digital version of the textbook. Also, 44.28% used material from the Photo Tree and 33.09% found it from colleagues.

Teachers were also asked about the amount of money they had to spend in total to meet the needs of distance education. From Figure 3 it appears that 31.6% spent 101-200 Euros and 30.2% spent 201-300 Euros. Another 15.8% spent 301-400 Euros and 15.3% up to 100 Euros. It is noted that 7.1% spent more than 400 Euros. Specifically, 41.8% of the teachers upgraded their computer, 48.2% upgraded their internet connection, while 52.1% bought a digital stylus and 48.3% a camera or microphone.

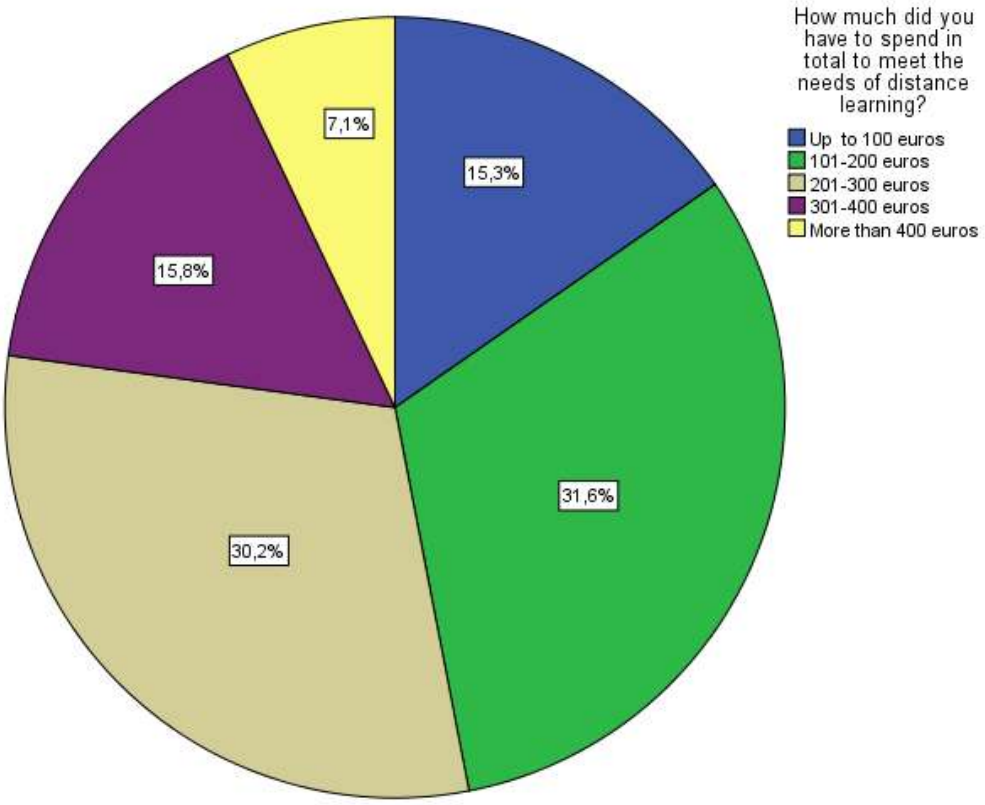

Figure 3. The cost for teachers.

Then, teachers were then asked to indicate their level of satisfaction about the support provided by several factors during the distance learning period. From table 5 it appears that teachers were more satisfied with their colleagues and the management of the school unit. Their satisfaction with the school counsellor is below average, while the levels of satisfaction from the Directorate of Secondary Education and the Ministry are lower.

Table 5. Satisfaction from cooperation.

	Mean Value (MV)	Standard Deviation (SD)
Ministry	1.89	0.996
Directorate of Secondary Education	1.95	1.066
School counsellor	2.26	1.253
School unit	3.33	1.320
Colleagues	3.61	1.261

Teachers were also asked if they will use distance learning techniques in addition to face-to-face teaching in normal conditions, with 46.72% answering not at all or a little, while 30.41% answered moderately. Finally, only 22.87% answered that they intend to use it to a large or very large degree.

In the last question the teachers were asked to evaluate their overall experience from their participation in distance learning. From figure 4 it appears that the satisfaction had a mean value (MV) of 6.45 with standard deviation (SD) of 2.156. It was then investigated whether there were differences in the evaluation of the overall experience of participating in distance learning in relation to teachers' demographics. Specifically, no statistically significant difference was found in relation to gender, where the mean value of women was equal to 6.45 (SD = 1.997) and of men was equal to 6.46 (SD = 2.293). Regarding the age of the teachers, no statistically significant differences were identified, with the teachers of the age group 41-50 years being more satisfied (MV = 6.65, SD = 2.115). The age group of 51 years and over followed (MV = 6.43, SD = 2.185), while the teachers of the age groups 31-40 years (MV = 6.19, SD = 2.189) and up to 30 years old were less satisfied (MV = 6.13, SD = 1.727).

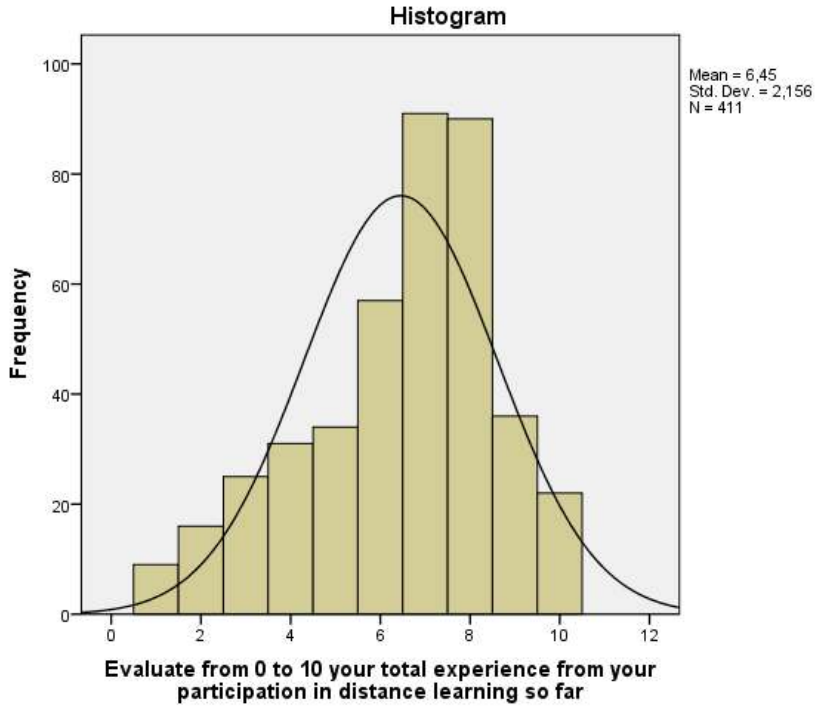

Figure 4. The evaluation of the overall experience.

In relation to the type of school unit in which they serve, the teachers who serve in Gymnasium (MV = 6.79, SD = 1.916) are more satisfied, followed by those who serve in General Lyceum (MV = 6.33, SD = 2.208) and finally, those who serve in Vocational Lyceum (MV = 6.07, SD = 2.473). Among the teachers who participated in the research, the most satisfied seem to be the teachers with 16 to 20 years of teaching experience in a public school (MV = 6.65, SD = 2.127), followed by teachers with more than 20 years (MV = 6.47, SD = 2.22). Satisfaction levels are slightly lower than the overall distance learning experience for the other groups. Specifically, those who have teaching experience up to 5 years had MV = 6.40 (SD = 2.001), while the satisfaction levels were lower for those who have 6 to 10 years of teaching experience (MV = 6.37, SD = 2.392) and from 11 to 15 years (MV = 6.24, SD = 2.111). Despite the difficulties of connecting to the internet, the teachers who serve in schools that are not located in the capital of a prefecture of the state seem to be more satisfied (MV = 6.89, SD = 1,872). They are followed by teachers who serve in schools in Athens or

Thessaloniki (MV = 6.34, SD = 2.205) and least of all teachers whose schools are located in another capital of a prefecture (MV = 6.26, SD = 2.287). It is rather expected that the teachers who had some contact with the P.S.N., before March 2020, are more satisfied (MV = 6.71, SD = 2.299), but the difference is not large compared to those who they did not have any kind of relative contact (MV = 6.28, SD = 2.040). Finally, in relation to the specialty, as shown in Table 6, the teachers of ICT were more satisfied (MV = 6.83, SD = 2,309) and the teachers of specialties in Vocational Lyceum were less satisfied (MV = 5.55, SD = 2.583).

Table 6. The evaluation of the total experience by specialty.

Specialties	Mean Value (MV)	Frequency	Standard Deviation (SD)
Literature teachers	6.31	32	1.925
Mathematicians	6.65	218	2.002
Physicists-Chemists-Biologists-Geologists	5.99	74	2.677
ICT teachers	6.83	23	2.309
Foreign languages	6.70	20	1.342
Other specialties of Gymnasium-Lyceum	6.27	33	2.096
Vocational Lyceum specialties	5.55	11	2.583
TOTAL	100	411	-

The questionnaire also contained three open-ended questions to which teachers were asked to justify their answer, if they wished. The first of them concerned the readiness of the students to give promotional exams at the end of the current school year. The majority of the teachers answered that student were not ready for the exams. The analysis of the answers showed that the main reason was that the lesson had not been consolidated, with complex exercises, and written tests, with the result that there was no supervision of the children's real knowledge. They also mentioned the relaxation that has taken place, as well as that there are parts of the lesson that cannot be easily taught remotely.

The second question was about whether the whole situation might affect the coming school year. Many teachers referred to educational gaps that have been created due to the fact that two school years were not practically completed.

In the last open-ended question, teachers were asked to record any comment about the research topic. Most teachers referred to the need for training, as well as the need for a grant in order to meet the requirements of the whole project, "since everything was done with equipment and resources of students and teachers". There was also a reference to the strong absence of the Ministry as well as to the need "to emphasize the psychological sector and the pedagogical / scientific documentation of distance education."

4. Conclusions

The COVID-19 virus pandemic has shown that countries need to be prepared to provide the best conditions for educating young students in every circumstance. In such a situation, moving from traditional to online education seems be the right, if not the only, option. However, issues such as availability of information technology equipment, Internet coverage and speed are essential, as well as the ability of teachers to use all these in an effective way (Basilaia & Kvavadze, 2020; Huang et al. 2020).

Following the developments during the first wave of the pandemic abroad, but also in Greece, it is found that efforts were made in order to maintain a minimum contact between teachers and students in various ways. The decisive factors were teacher’s activation in a situation, not so familiar to them, their evolution in the

enrichment of new educational situations, but also in the handling of new digital tools. Their adaptability was exemplary and mainly thanks to them the contact between teachers and students was maintained and the academic year was not lost. The second wave found the governments better prepared, but in many cases not in the desired degree. Our research focuses in the ways the teachers dealt with their teaching duties during the pandemic expressing the need of the Ministry's support towards the improvement of schools' infrastructure, as well as their training in distance learning techniques. No specific sampling method was adopted for the selection of the sample, as a result of which it is not easy to generalize the conclusions. It should also be noted that the distribution of the teacher's specialties is unequal and that the sample is relatively small.

The abrupt introduction in distance learning in the first levels of education has preoccupied researchers around the world. One such study was that of Giovannella et al. (2020), which was conducted in Italy, on a sample of 336 primary and secondary school teachers. The analysis of the data showed that the teachers showed a high professionalism, which was the key factor that contributed to the educational continuity, despite the many problems, such as increased workload, poor internet connection, the inadequacy of the house as a work place. etc., which was also evident from the present research. Another point that the above research seems to agree with the present, is that teachers do not seem to be willing to use distance learning in the future, as they clearly prefer face-to-face teaching. On the contrary, Italian teachers are more satisfied with the support provided by the Italian Ministry of education.

The study by Niemi & Kousa (2020), which took place in Finland, involved students and teachers of a school, who were asked to answer the relevant questions four times (in a period of two months) during the period of suspension of schools. The teachers seem to be more satisfied than the Greek teachers who participated in the present study, while in both cases they agree on the lack of effective contact with their students. Moreover, in both cases there is a concern for the progress of their students.

Ballova & Verešova (2020), after analysing data from a survey of 379 primary and secondary school teachers from Slovakia, concluded that teachers had changed their teaching practices significantly in order to cope with the new situation. They had to spend more time for the preparation of the lesson, but also for the teaching, since the hours of the program schedule were not enough. A big change was the way of evaluation, which was based more on the oral than on the written examination, a practice which was encouraged by the Slovakian Ministry of education.

As for the benefits of this situation many researchers pointed out that online education may be useful in the future, as students had the opportunity to work more independently, and generally were able to get new skills. Also, teachers were able to handle a new way of teaching, by actually becoming more learning facilitators (Ballova & Verešova, 2020).

Finally, the research of Jelińska & Paradowski (2021), on a sample of 1500 teachers from 118 countries, is not able to give an idea of how each state managed the pandemic, in terms of education, but showed the anxiety of teachers, but also their view that we are at the beginning of many changes in education. The new role of teachers is also mentioned in the research of Huang et al. (2020). Teachers should be able to use new, interent based methods, in order to fully take advantage of the benefits of distance and on line learning. This calls for the appropriate training of teachers in every level of education (Huang et al., 2020), somethning that was pointed out also by the Greek teachers who participated in the specific research.

The present research is a first stage of study in Greece. It is certain that more research and study is needed, because such difficult social situations may reoccur. In this case distance learning will be needed again and we have to be better prepared in order to provide the best education for the students. The urgent need for substantial training of the educational staff in Greece was highlighted, as well as the need for the improvement of the material and technical infrastructure of public schools.

This paper is particularly important for another reason. Many of the students, currently in secondary education, are future University students, where the use of distance learning methods is more wide, not only in forced situations, such as the COVID-19 pandemic, but also in normal situations, as students can connect to online lectures, following their schedules and learning at their own pace (Goh et al., 2020). It is therefore appropriate to consider whether, and to what extent, secondary education is able to equip students with those skills which are necessary for distance learning. We may say, that Greek students were forced to use distance learning education methods for a long period time, but despite the difficulties they had their first contact with distance education.

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Non typical workplace learning in Greece during the pandemic

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Abstract

From March 2020 until now, teleworking and e-collaboration have become a major issue for most companies and organizations. The remote type of working affected, among the rest, the continuity of their learning programs since face-to-face seminars and workshops had to abruptly be stopped.

Most research interest in Greece focuses on typical educational settings, even though workplace learning, and non-typical learning is a very important sector in education. Thus, the aim of this paper is to illustrate the response of Greek companies and organizations of non-typical learning to the coronavirus lockdown to continue their teaching and learning activities.

How did the companies and organizations respond to that challenge and how did they manage to achieve the continuity of their teaching-learning programs? How did they train the key-persons responsible to be capable of running remote educational programs? Which new subject matters did they add to their learning curriculum and which teaching techniques did they implement? How did the target audience respond to their effort? And above all, what is the legacy for the post-COVID era in workplace learning and other forms of non-typical education?

The data gathered derives from various sources, such as bibliographical references on workplace learning, data gathered from e-learning companies on new and existing clients and focus on specific case studies from companies and non-profit organizations with interviews with selected key-persons responsible.

Keywords: e-learning; workplace learning; non-typical learning.

1. Introduction

E-learning has been part of the Organizations' and Companies' educational programs worldwide for more than 15 years. During the previous decade, in most cases the educational programs that were running in workplace environments in Greece were blended, with face-to-face teaching and learning being at the core of the educational process and e-learning as supplementary. Since the Covid-19 outbreak, due to the forced lockdown during the months March-May 2020 and the unstable situation of the following months, there was an outburst in demand for technological solutions as well as pedagogical paradigms to convert the face-to-face education online. Today, most people in work-related programs study online. Studying online has affected the way we learn and teach, and has dramatically changed the characteristics of workplace programs as well as the criteria of their success. The research in workplace e-learning has become more necessary than ever; the lack in retrieving sufficient data in specific contexts makes it even more necessary to understand the peculiarities of this specific area of non-typical education.

2. Workplace learning

Workplace and work-related learning have attracted the research interest since 1990 (Boud & Garrick, 2003), with most researchers belonging to the thematic fields of education and management.

The working environment has soon been acknowledged as a truly authentic learning environment (Billett, 2001) since it provides the employees with the experiences and the opportunities for learning advancement and facilitation. Nevertheless, we should always consider that "learning is not the main scope of a company but draws from the need to fulfil the organizational scope for the provision of products and services" (Fuller, Munro & Rainbird, 2004). In addition, in the working environment we frequently observe conflicting interests, which inevitably affect the characteristics of workplace learning programs (Boud & Garrick, 2003) and decisions related to their implementation.

The constantly changing environment, in which we live, has affected the nature of working and learning. Companies and organizations have acknowledged the fact that their main asset is linked to the knowledge, skills, and competencies of their employees and that's why setting up opportunities for their training should be a priority for the companies' further development. Therefore, further research in workplace learning would facilitate the effectiveness of the workplace learning programs.

In their seminal book, "Understanding Learning at Work", Boud & Garrick (2003) highlight the link between working and learning and the need to build a common language between researchers and human resource managers:

> *"Work" and "learning" are concepts which used to belong in separate categories. Work was about producing or doing things to earn a living. Learning was about education; it occurred in life before work. Training might be necessary at first in the workplace, but everything else that was needed for a lifetime of employment could be picked up from experienced fellow workers. The world has changed dramatically since this was so.*
>
> *In this changed world it is therefore surprising to find that dialogue between, on the one hand, those who have studied learning and, on the other, those who need to understand the learning implications of work has been almost absent. A gulf has existed between the two. Researchers interested in teaching and learning have overwhelmingly confined their explorations to educational institutions. They have looked to their academic peers for recognition. Human resource managers have had little interest in fostering research on learning. If they have thought about it, they are likely to have assumed that the*

> *differences between their own organizations and those investigated by researchers are so great that there is, in all likelihood, nothing worth looking at. Researchers and managers have occupied such different cultures that there are substantial differences between the language they use and the views of the world which they hold. It is not surprising then that communication has been so limited.*
>
> *This position is no longer sustainable. The imperatives of work mean that an understanding of learning issues is needed at all levels.*

Let us also take into consideration the fact that after the outbreak of the pandemic, most people study online. Studying online has affected the characteristics of the workplace programs and the criteria of their success dramatically. Thus, this is another area in need of research and cooperation between researchers and the people involved in the design, implementation, and evaluation of the programs on behalf of the company.

Different types of workplace and work-related programs

The types of learning programs one can find in the workplace may apply in all types of learning: formal, non-formal and informal learning.

Formal learning is linked to typical -university- education. In Greece, many institutions and companies have signed a Memorandum of Cooperation with universities. Through the memorandum, they invest on their human resource capital in many ways:

- by contributing to their employees' fees (graduate and post-graduate degrees)
- by acknowledging the learning gap between university degrees and requirements linked to specific occupations
- by sponsoring specialized training programs that cover the abovementioned gap
- by participating in those programs in many ways, for example, as keynote speakers

A successful example of synergy between a company and a university institution is the cooperation between APIVITA, a natural cosmetics international company and the Lifelong Learning Centre of the Athens University of Economics and Business. The two entities worked together to design and implement the learning program "Business Administration and Entrepreneurship for Pharmacists" (Athens University of Economics and Business, 2021). The specific program runs for more than five years in a row and has been awarded at the "Hellenic Responsible Business Awards 2019", an institution, which aims "to award companies that promote the values of Corporate Responsibility and invest on Sustainability" (Hellenic Responsibe Business Awards, 2021).

Informal learning happens, even if we do not realize it, in our everyday activity at work through our responsibilities and the problems we are called to solve in real-time situations. Our colleagues may act as facilitators to our informal learning and we may adopt the same role for them.

In this research we focus in **non formal learning**, which is realized through specially designed educational programs. Non-formal learning occurs "consciously, selectively, voluntarily" (Lionarakis, 2013). It may occur in any environment, "in which teaching, and learning is not considered to be the main activity of the organization. We usually find non-formal educational programs in the workplace, in social services organizations, but also in sectors that support formal learning" (Lionarakis, 2013).

The educational programs that run in the workplace are addressed to the employees of each institution and in some cases, to external providers, suppliers, franchisees etc. They have specific scope and require expected

results while most of them include evaluation methods that leed to successful completion and in some cases to certification. A succesful implementation should also include mechanisms for students' support and feedback.

As soon as the internet has become an accessible commodity, e-learning and online learning enhanced learning programs of all types of education (school, university, lifelong learning) with more flexibility, more options for content delivery and communication between participants and more opportunities for participation. During the pandemic, e-learning and online learning gave direct solutions, some of them improvised, others carefully designed, which enabled the continuity of the educational procedure (Chartofylaka, Manousou, Mavroidis, 2021).

3. Methodology

The scope of this paper is to examine the implementation of e-learning in the workplace or work-related educational programs in Greece, from 2006 until today. The study of the literature review led to three research questions; two of them are directly connected to the main scope of the study, while the other is linked to the research difficulty in finding sufficient data on that subject matter. The research questions are:

- Which are the main reasons that studies on workplace learning are rare findings in Greece?
- Which were the main characteristics of workplace or work-related e-learning before the pandemic?
- Which are the main changes that occurred in workplace or work-related e-learning during the pandemic?

The paper follows a descriptive approach to examine selected aspects of the e-learning implementation into workplace educational programs in Greece before and during the pandemic, covering the years 2006 until present.

The data gathered covering the first period (2006-2019) derives mainly from literature review, the researchers' professional notes from participation in relevant programs and data gathered from e-learning companies that acted as services providers.

The data gathered covering the second period (2020-2021) is based on five free-form interviews with key persons who were involved in the designing, the implementation, or/and the evaluation of e-learning educational programs within companies and organisations. The persons were selected for their close involvement in the field and their overall experience. The profile of the interviewees is the following:

- Two of the interviewees (IE1, IE2) work as project managers in e-learning companies that provide other companies with e-learning solutions.
- Two (IE3, IE4) are HR managers in medium sized companies that have started to run e-learning programs in their companies recently.
- One interviewee (IE5) works as a trainer in a company that has been running e-learning programs for more than 15 years.

The data was grouped in key-categories and analyzed accordingly, to respond to the research questions. The key-categories that emerged for research questions 2 and 3, are the following:

- beneficiaries
- benefits
- main characteristics / methodologies used

- professionals involved
- subjects covered

Research question one was linked to an open discussion regarding the evaluation of the e-learning programs and the dissemination of the results.

4. In search of sufficient data

The International Conference in Open and Distance Learning (ICODL) is the first educational conference in Greece, which is dedicated to open and distance learning. It was first introduced to the public in 2001 (ICODL, 2021) and has been realized since then every two years. Another medium dedicated to open and distance learning in Greece is the Journal for Open and Distance Education and Educational Technology. The first issue was published in 2005 (Open Education, 2021), in printed format at first and then, since 2008, in digital form with open access. In both sources, the lack of examples from workplace learning is apparent, while one can find a vast number of case-studies dedicated in school education.

In 2009 another channel, with the aim to make innovative e-learning practices known to the public emerged: the 1st e-learning expo. The profile of the expo was mainly commercial, not academic, with the aim to present products and services linked to e-learning but it also hosted interesting round tables and presentations of case-studies. The expo ran every year but ended in 2013, due to the unprecedented economic depression in Greece.

The information that was shared during these events has been valuable even though it was never published. Thus, the relevant data that is used in this paper leans on the authors' participation. Nevertheless, it was very helpful to all persons involved in workplace e-learning to watch the presentation of context-specific case-studies from companies all over Greece and share insights and viewpoints.

The context plays a crucial role in all aspects that are linked to strategic human resource management; education is not an exception. According to Armstrong & Brown (2019), there has been a strong debate between researchers, "what became known as 'best fit' (the belief based on contingency theory that HR strategies should be related to the context and circumstances and 'best practice' (the view that there is a set of HRM practices that are universal in the sense that they are best in any situation)". In HR education as well, there is no such thing as universal best practice. The country characteristics, each company's philosophy, even the relevant regulations and laws, all affect the design and implementation of educational programs. And that's why the presentation of real life projects designed and implemented by Greek companies for their employees was so important.

Even though we have no targeted research available to understand the reasons why research in workplace learning is neglected in Greece, the review of the literature and the implicit statements of the people responsible for the implementation of programs on behalf of the companies through interviews and casual discussions, led us to the following reasons that should of course be tested:

- **Learning is not the main scope of a company** (Fuller, Munro & Rainbird, 2004)

Thus, the people responsible for the design or/and the implementation of an e-learning program are not obliged to add more workload to their already stressed program. It is simply not in their job description.

- **E-learning programs usually contain original ideas or/and case-sensitive data that the companies do not want to share.**

Companies share when they can get an advantage of it; otherwise, they prefer to keep information internally. As an interviewee mentioned (IE4) “The program we designed is our strategic advantage; We would not share our perspective with our competitors”. Another interviewee (IE3) pinpointed the need to protect the information that one can find at the courses, especially if it is directly linked to the products and services of the company. It is true that usually the courses contain crucial information about the products and services of the company, and that’s why they should not be shared. A representative of an e-learning company (IE2) mentioned that the evaluation of the program is a necessary step to get feedback and redesign the things that did not work in the first place. Nevertheless, the evaluation reports that emerge are for internal use only, due to the above-mentioned reasons.

- **Research requires time and money**

“It is undisputable that research findings help us get better at what we do”, said IE1. “In most cases though, there is just not enough time and resources to run proper research on programs evaluation. The deadlines are strict, and one project succeeds the other, leaving us no time to reflect on what we have done and what we could do better”.

- **Mentality**

In other cases, the clients are unwilling to test the effectiveness of the programs they run because they confront it as an indirect evaluation of their role (IE5). The e-learning companies are also reluctant to do so for the same reason (IE1&IE2).

5. Workplace e-learning in Greece before the pandemic

Beneficiaries

E-learning has been part of the Organizations’ and Companies’ educational programs worldwide for more than 15 years. In Greece, during the previous decade (2010-2019), Organizations and Companies that benefited the most from e-learning solutions were large and medium sized ones, most belonging to the sectors of banking, shipping, retail, insurance etc. (Chartofylaka, Charhalos, Manologlou, 2013). Companies with geographically dispersed employees, for example retail companies who were running stores all over the country or/and abroad, or professions with a “moving office” (health occupations, insurance agents, salesmen/saleswomen, sailors etc.), were the first to express interest in this “new” -at that time- form of learning.

On the contrary, most small-sized companies did not show any interest in using e-learning as an alternative form of education. The same stands for consulting companies that run business-oriented seminars: the face-to-face provision of services had no alternatives.

The benefits of e-learning implementation

Even though HR managers were initially reluctant to acknowledge the benefits of e-learning in the educational process, they recognized the cost-effectiveness of the whole endeavor quite early. In fact, this was the most irresistible argument that the e-learning and e-content development companies used to use with the aim to sell their services.

In the cases of successful e-learning implementation though, the people who run the educational programs soon realized that there are even more important benefits than the economy related one (Stoilova, Chartofylaka, 2010), such as:

- flexibility in time, space, and study pace of students
- direct dispersion of important information (for example, the characteristics of a new product)
- measurable results
- automation of actions through the selected LMS, which resulted in saving precious time of the educators
- enhancement of collaboration and cooperation between the learning team regardless of the remoteness, etc.

The main characteristics of the workplace educational programs

During the previous decade, in most cases the educational programs that were running in workplace environments in Greece were **blended**, with face-to-face teaching and learning being at the core of the educational process and e-learning as supplementary. Many educational programs followed the model of the "flipped classroom", "*a pedagogical form of blended learning where the traditional classroom is flipped or inverted by delivering instruction outside the classroom and then bringing the application of learning outcomes into the teaching space."* (James, Chin & Williams, 2014), even though they may have not been aware of the term at that time.

To do so, they used different forms of **pre-recorded/pre-formed digital learning material** (video recordings or/and graphic presentations with or without narration) to introduce the participants to the main notions of the course, providing the tutors with the extra time needed in the face-to-face meetings for quality dialogue with the participants, question solving, collaboration and the implementation of effective teaching and learning techniques. It is worth mentioning at this point that according to Papastefanaki-Pappa (2005), who ran a PhD thesis in workplace learning at the banking sector, many people involved in the implementation of the programs at that time expressed a disbelief in the efficiency of the method to train the learners in practical issues (workshops). The skepticism in the effectiveness of distance learning in specific thematic fields still stands and it has been also expressed by teachers during the pandemic (Manousou, Ioakimidou, Papadimitriou & Chartofylaka, 2021)

The whole e-learning experience was accommodated in an LMS which hosted the digitized material, the communication forum between the learning community, the assignment upload procedure, et cetera. Since the cloud computing was not even close to popular before 2016-2017 in Greece, the LMS was hosted in the clients' or the external providers' infrastructure; this can be translated in relatively high initial and maintenance costs, which could be supported by medium and large-scale companies only, excluding the small-sized ones. Researchers and practitioners pinpointed the need in finding solutions for inclusion (Chartofylaka, Charhalos, Manologlou, 2013) and the use of Open Educational Resources to reduce the cost was one of them (Coughlan, 2011).

Live webinars and teleconferences were not very popular at that time, due to the internet connection restrictions, especially in the rural areas and the small islands of the country. Even the Hellenic Open University, the first and only University operating in Greece exclusively by distance, incorporated teleconferences in its programs no sooner than 2017. So, the main communication and collaboration method between the learning community was the asynchronous text-based communication via the forum or the email.

Professionals involved

In the period we are examining, we clearly distinguish two different groups who worked separately for the realization of an e-learning project. The first group was formed by the company's employees, subject experts and responsible for the implementation of the specific project.

The second group, most probably an external supplier, such as an e-learning company or a consortium, was responsible for:

- setting up the LMS
- designing the learning experience
- digitizing the content
- training the trainers
- evaluating
- overall technical support

We should note here that a significant change occurred from 2014 onwards with the introduction of easy-to-use authoring tools for content creation. In Greece, many companies decided to redirect some of the e-learning creation tasks internally and create the necessary teams. As we will see, this tension became even more apparent during the pandemic.

Subjects covered

According to data retrieved from two e-learning companies, until 2019 clients were mostly interested in developing courses on their products and services (product and service training). These courses were based on the companies' original content that they used in face-to-face teaching. They also had demands for soft skills training, such as customer service, complaint management, sales etc. This kind of courses could be covered with readymade content from consultancy companies or other subject matter experts and not from within the company. In many cases, they preferred to buy courses' licenses from international e-learning content providers or plan for the localization of the selected courses. The idea did not flourish in the long run, probably because the courses were missing the context-specific paradigm.

There was also growing interest in compliance courses, such as Corporate Social Responsibility, Health and Safety, et cetera. Lastly, the companies demanded induction courses for their newcomers' employees.

6. Workplace e-learning in Greece during the pandemic

Beneficiaries

From 2016 onwards, more and more people benefited from e-learning and learning online. As it has already been mentioned, the cloud computing made it easier for the interested parties to maintain an LMS without the huge initial costs of the past. In addition, the LMS became more user-friendly and easier-to-use by an average user. The costs became flexible, depending on the people enrolled and the time length of the class. E-learning was no longer the privilege of large-sized companies; small-sized companies could also benefit from this form of teaching and learning. Even a freelancer teacher could easily rent a cloud-based LMS and run their class for a limited period. Another groundbreaking technological change in the world of e-learning that happened the last 4-5 years was the development and growth of the authoring tools, which affected the composition of the teams involved to create an e-learning program.

And then, came the pandemic.

The term “emergency remote teaching”, which was first introduced to describe the difference between well-planned online learning experiences and courses offered online in response to a crisis or disaster in typical education (Hodge, Moore, Lockee, Trust & Bond, 2020) is valid for the informal context of workplace as well.

As Misirli & Ergulec (2021) state: “In a normal situation, online education creates flexibility for learning and teaching from anytime and anywhere. However, the COVID-19 pandemic prompted an emergency transition from traditional to distance learning at all levels of education”. Emergency remote teaching was a temporary solution to an emergent problem.

During the first weeks of the pandemic, companies, as well as individuals, were at a shock. The companies strived to find new ways and tools for communication, collaboration, and project management. Apparently, training could not be their top priority at that time since they had to ensure their day-to-day and future operation in this terrifying changing environment. The exception to this were the consultancy companies – training providers. This category of companies and freelancers were the first to seek for e-training solutions because teaching was their main service.

After the first period of shock, companies started to search for solutions, since it was still unclear when and on which conditions they could return to their face-to-face former situation. Of course, the companies that had already incorporated e-learning in their training programs held a significant advantage. They had their virtual classroom ready, the necessary software tools to build synchronous and asynchronous learning experiences and a library of courses for delivery. Of course, new learning needs occurred which led to the demand for new e-courses and webinars.

The companies that were exclusively using face-to-face teaching until the outbreak, had to start from the beginning, and this was a rather frustrating experience, since the time was pressing, as was mentioned by interviewees (IE3 & IE4) and the knowledge on that field was insufficient. Nevertheless, as the representatives of e-learning providers mention (IE1 & IE2), the demand for e-learning and online solutions in Greece was unprecedented, especially right after the end of the first lockdown (May 2020). So, more and more companies decided to enter the world of learning online by seeking for a reliable e-learning provider. The demand for LMS solutions and the purchase of authoring tools increased as well.

The benefits of e-learning implementation

“Could we have done otherwise?”, interviewees IE3 & IE4 wonder. Successful or not, effective, or not so, the implementation of e-learning and online learning programs gave everyone the sense of continuity; and this was the main benefit at that point.

Was that all? Of course not. The broad use of digital tools for communication, collaboration, and education, increased the level of digital literacy of all people involved and showed an alternative methodology and practice for teaching and learning. It also highlighted the need to improve skills linked to flexibility and adjustment to unstable situations (Manousou, Ioakimidou, Papadimitriou & Chartofylaka, 2021).

In addition, many professionals started to understand the complexity of distance learning design and implementation. Due to the outbreak, many e-learning and online programs were implemented as an emergency respond, without proper design and training of the people involved. The poor results linked to the students’ satisfaction from their participation in webinars, as derived from the responses of the two interviewees (IE3 & IE4), showed the need for training in subjects, such as distance teaching, creating digital learning material, communicating, providing feedback by distance, as well as providing effective synchronous teaching events. It became apparent that the people involved in education, had to “break” certain

stereotypical perceptions linked to conventional education and to stop thinking of physical face-to-face teaching as a one-way ticket to create educational experiences.

The above-mentioned benefits have the power to enhance the dynamic of educational programs in the workplace and in general in the long run. E-learning and learning online entered their maturity phase.

The main characteristics of the workplace educational programs

Synchronous online learning through webinars outflanked asynchronous e-learning during the first period of the pandemic, especially by companies that were exclusively using face-to-face teaching until the outbreak. This was an expected choice; it could be implemented simply by "transferring" teaching from the classroom to the screen.

Reality confirmed the literature review (Koutsouba, Koutsouba & Giossos, 2021; Lionarakis, Manousou, Chartofylaka, Papadimitriou, & Ioakimidou, 2021): the transition was not that simple as first was assumed.

It was initially believed that teachers and the rest of the people involved in the educational procedure could proceed without any previous training. In their research on the training needs of school-teachers during the pandemic, Manousou et al (2021) say: "The educational community, especially at the first phase of the pandemic and the first lockdown (March-May 2020), seemed stretched and obviously without any familiarization in terms, principles and matters of distance education". And although there was a large effort to train the school-teachers via seminars, MOOCs and other sources, (Manousou et al, 2021), apparently workplace learning still remained a neglected area. The e-learning providers undertook the consultancy role and clients were now more open to suggestions and advice.

The companies that had already incorporated e-learning in their training programs followed a blended model: they continued their asynchronous e-learning programs which were enhanced with synchronous communication via teleconference and selected webinars from key-note speakers, who were ready to provide their services online.

So, if we try to summarize the main characteristics of workplace educational programs during the pandemic, we will conclude to the following:

- ✓ Broad use of teleconference for synchronous online learning
- ✓ Continuity in the already functioning asynchronous e-learning programs
- ✓ Gradual use of asynchronous e-learning by the "newcomers" to learning online, as a result of understanding the complexity of the new learning paradigm
- ✓ Increased interest for reliable content in the form of webinars or pre-packaged educational material according to the specific learning needs of their audience and the general needs in specific topic areas
- ✓ Increased interest in training the trainers for better results and student satisfaction

Professionals involved

Several years before the pandemic, another groundbreaking change in the world of e-learning, besides the easy access to user-friendly LMSs, was the development and growth of the authoring tools - software programs that "help you write using hypertext or multimedia applications and enable you to create a final application merely by linking together objects, such as a paragraph of text, an illustration, or a song. By defining the objects' relationships to each other, and by sequencing them in an appropriate order, authors (those who use authoring tools) can produce attractive and useful graphics applications" (Khademi, Haghshenas & Kabir, 2012).

Even though the license cost for acquiring a professional authoring tool is still high for a freelancer in Greece, the price is relatively fair for the size of a company. That's why some companies decided to give it a try and create their e-learning teams for e-learning content development internally. During the pandemic, the demand by companies for e-learning professionals increased in Greece, as seen in relevant LinkedIn advertisements, and the schemes of cooperation between e-learning companies and their clients became more agile.

The main categories of the e-learning professionals who are connected to the e-learning content development are:

- ✓ Instructional designers
- ✓ Graphic designers specialized in e-learning content development
- ✓ E-learning developers – expert users of the authoring tools

Other significant roles linked to the overall implementation of an e-learning program are:

- ✓ Developers specialized in LMS management and configuration
- ✓ E-tutors
- ✓ Student support staff
- ✓ Technical staff

Interviewees IE1 and IE2 mentioned that for the first time, their clients demanded for their services vertically and not horizontally. For example, a company with a readymade team of instructional designers and e-learning developers, only needed graphic design services to complete their project; or more experienced e-learning development services to implement a complicated project.

This change brought e-learning companies and internal employees closer since they had to closely cooperate to complete the project. The boundaries between the two teams (internal and external) became more agile.

Subjects covered

According to data retrieved from the two e-learning companies, from 2020 onwards clients are still interested in developing courses on their products and services (product and service training). The interest in compliance courses such as General Data Protection Regulation (GDPR), Corporate Social Responsibility (CSR), Health and Safety, Compliance to the Basel Framework in the Banking sector etc. rose since many institutions are obliged by the Law to provide their employees with training on these topics.

The need for new skills and competencies brought new e-learning content development for asynchronous learning as well as the design of online courses for synchronous courses, covering subjects such as e-collaboration, effective feedback, e-negotiations, e-tutoring and technical training on specific software tools.

7. Conclusions

After the outbreak of the pandemic, e-learning and online learning were the only options to continue the training withing companies. Synchronous methods of training, such as webinars, prevailed at the beginning, but the need for a blended form of learning by distance, both synchronous and asynchronous became apparent. Technology could now support the endeavors of the people involved through easy-to-use and relatively accessible software tools for digital content creation and administration of the digital classroom.

Nevertheless, since we have entered the maturity phase of learning online, it is clear today to most people involved that distance education needs much more than tools to be implemented effectively. For the first time,

people demand proper training and understand the need for specialized educational, design and technical services. It is not early to say that the mentality has changed. The HR managers and other people involved in the training programs of companies have understood the depth of the endeavor and are looking for quality solutions, which can be found internally, through the creation of e-learning specialist teams, externally, through professional e-learning providers, or combined.

The lack of data dissemination still stands though. During the last one and a half year in Greece, there were numerous online workshops, seminars and conferences for school-teachers, where they could share their insights, problems, good practices and practices that did not work (Manousou, Ioakimidou, Papadimitriou, Chartofylaka, A., 2021). The framework of teacher support also included specially designed MOOCs and webinars by the Hellenic Open University, the University of Crete, and the Aegean University. On the contrary, professionals in the workplace were trying to figure out what the best solution is specifically for them, usually without the proper knowledge.

The main reasons why workplace learning professionals resist cooperation and are reluctant to disseminate valuable results still stand. The change of mentality in this unstable, constantly changing environment to a more open approach is the only way to achieve better results and to give workplace learning the quality and credibility it deserves.

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Remote electronic examinations in the Hellenic Open University during COVID-19 pandemic: Student and faculty perceptions

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Abstract

The COVID-19 pandemic coerced Higher Educational Institutes into the adoption of alternative approaches in delivering their learning activities including examinations. The Hellenic Open University (HOU) adopted remote electronic examinations as a one-way solution due to physical presence restrictions. This study presents the evaluation of the remote electronic examination process conducted by the HOU at the end of the academic year 2019-2020 (June-July, 2020). Two samples of 9.276 students and 884 faculty members respectively participated voluntarily and filled out two questionnaires. Both qualitative and quantitative analysis was carried out. Quantitative results revealed that both students and faculty were more satisfied with the briefing of the examination procedure, the examination platform and the examination methods. Students stated less satisfaction about the available examination time while faculty stated satisfied enough. Qualitative results revealed that avoiding travelling, saving money and reducing stress were the main benefits mentioned by both students and faculty. As main disadvantages, students posited the several problems they faced with the examination topics (e.g. content comprehension, presentation and volume) and the limited time they had at their disposal, while faculty raised mostly issues about the integrity assurance of remote examinations.

Students mostly wanted improvements on the remote examination methods and topics and more examination time while faculty mostly wanted improvements on the integrity assurance of the examinations.

Keywords: COVID-19 pandemic, remote examinations, distance education.

1. Introduction

COVID-19 has affected Higher Educational Institutes (HEI) around the world. The crisis hastened the transition of academic activities (e.g., teaching, assessment, research etc.) and management services to online delivery modes (Ready, et al., 2021) with few universities or colleges being prepared for such a rapid shift (Crawford et al. 2020). Apart from the courses, the COVID-19 crisis affected the examination process as well. As a consequence, remote examinations supported by electronic means were adopted from many HEIs (OECD, 2020). Undoubtedly, over the last years, there was a significant increase in interest from HEIs to shift from pen-and-paper examinations to the use of computers (Hillier & Grant, 2018). However, during the pandemic, the scale of the shift to online examinations was without precedent and posed an additional great challenge related to students' physical absence from the examination venues. Nevertheless, this rapid expansion and acceptance of digital and online technologies seem to open up promising prospects for student assessment (Fluck et al., 2017). In this context, the policies of academic administrations should provide a flexible examination process so as not to put faculty and students at a disadvantage (Bothwell, 2020). Examinations during the COCID-19 crisis must be flexible enough to allow a variety of methods and take into account the requirements and expectations of multiple participants. Electronic examinations can address issues that involve complex responses which could not be given by the traditional examination approach (Fluck and Hillier 2016). However, electronic examinations may confront challenges, such as cheating, difficulty in assessing several disciplines, technical failure risk (Sahu, 2020), lack of training, poor digital skills (Onyema, et al., 2020), etc.

Courses in HOU are provided through a distance learning method. However, examinations are conducted only in person by using the traditional pen-and-paper method. Regarding the abovementioned forced shift to remote electronic examinations, HOU adopted a Synchronous Remote Examination (SRE) process. This research presents faculty and students' perspectives on the implementation of the SRE process. More specifically the research questions were the following:

1. To what extent students and faculty are satisfied with remote examinations?
2. Which are students' and faculty perceptions about the positive and negative aspects of remote examinations?
3. What do students and faculty suggest for the improvement of remote examinations?

2. Theoretical framework and research context

Assessment is the process of collecting and studying data about learner's performance. Assessment is formative when it aims at checking students' learning process during a course in order to improve their performance. Moreover, assessment is summative when it aims at grading students either at the end of a course or at particular periods (Ilgaz & Afacan Adanır 2020). The term "electronic assessment" describes the 'assessment based on using information technology (Alruwais, 2018, p. 32). The term "electronic evaluation" refers to a system that involves the conduct of examinations through the web or the intranet' (Ayo et al. 2007, p. 126). Finally, the term "remote electronic examination" refers to the examination that takes place at a location remote from the examining institution using the Internet for communication' (Thomas et al., 2002, p.537).

Several advantages of electronic assessments and examinations are detected in the literature. They provide immediate automated or semi-automated student feedback (Betlej, 2013; Nguyen et al., 2017) as well as a variety of question styles (James, 2016) and multimedia types (Pagram et al. 2018) and they reduce the possibility of cheating (Farzin, 2017). They are flexible regarding location and time (Alruwais, 2018), they are conducted in a comfortable environment reducing anxiety (James 2016) and they save time, effort and cost (Ilgaz & Afacan Adanır, 2020).

As significant challenges of electronic assessments and examinations are reported: reliability and usability issues of the assessment/examination systems (Dammas 2016; Hillier et al., 2018; Khan & Khan, 2019), internet or network connectivity/quality issues (Bashitialshaaer et al., 2021; Ilgaz & Afacan Adanır, 2020), poor/unreliable infrastructures (Bashitialshaaer et al., 2021) and vulnerability to cheating (Sindre & Chirumamilla 2015).

Students face challenges such as their inexperience with the assessment/examination process and their lack of typing skills (Khan & Khan, 2019), an intensified stress due to time-consuming and the fear of system failure and data loss (Pagram et al., 2018). Additionally, electronic assessments/examinations are not always representative of students' line of thinking and course performance (Bashitialshaaer, Alhendawi, & Lassoued 2021; Betlej, 2013) and they tend to underestimate students' high order competencies mostly due to the use of close-ended formats (e.g MCQs, matching, etc.) (Hodgson & Pang, 2012).

Teachers often consider electronic assessments and examinations as time-consuming concerning the preparation of qualitative assessment materials and meaningful feedback (Kuikka et al., 2014; Snodgrass et al., 2014). Teachers also are not always experienced with technology and lack the required digital skills to prepare, apply or support assessment (Bashitialshaaer et al., 2021; Khan & Khan 2019a). Often they seem to resist using examination systems due to their attachment to traditional examination habits (Kuikka et al., 2014).

HOU has been working towards addressing most of the challenges of remote examinations during the pandemic. Ten days before their scheduled examination, students were given instructions for the submission procedures (e.g. types of files they could submit where necessary such as doc, pdf, jpeg, etc.) and demos to perform simulations for acquainting themselves with the remote examination process. As an examination platform, a version of the Moodle learning management system was customized to suit the SRE process. To prevent dishonest behaviours, a voluntary team from the HOU administrative staff was trained to support faculty in the invigilation of the examination process through the use of Skype for Business (SfB). SfB was also used for the authentication of students' identities. The methods by which students were examined were the following:

- Written examination with open questions
- Written examination with multiple-choice questions (MCQs)
- Written examination with MCQs and open questions
- Oral examination
- Final written assignment-project
- Final written assignment with potential oral presentation
- Written examination with oral presentation

Depending on the written examination method, students could submit their answers directly to the platform or upload files containing their answers. The oral examination took place exclusively through SfB. In the potential oral presentation, faculty after grading students' answers had the choice, if necessary, to call some

of them for an oral presentation. The variety of examination modes, which were decided by course coordinators, aimed at ensuring case-by-case the fair treatment of students, anxiety reduction and dishonest behaviour prevention (Davis et al. 1992; Hollinger & Lanza-Kaduce, 1996).

3. Method

The research was conducted by the Internal Assessment and Training Unit of the HOU with a sample of 9.276 students and 884 faculty members participating voluntarily. Students and faculty were asked to fill out anonymously two short questionnaires with 11 questions respectively. On both questionnaires, eight Likert-type questions were included, ranging from "not at all" (1) to "very much" (5), which concerned student and faculty satisfaction from the examination process (individual dimensions of the examination process, integrity assurance, desire to examine/be examined remotely in the future). Also, three open-ended questions on both questionnaires were asking student and faculty views on the positive and negative aspects of remote examinations as well as their suggestions for future improvements. The questionnaires were pilot tested before they became electronically available to students and faculty. The study was conducted in two separate periods: from August 4th, 2020 to September 4th, 2020 for students and from October 26th, 2020 to November 4th, 2020 for faculty. Quantitative data analysis was based on descriptive statistics, where means and 95% Confidence Intervals are used to display samples' answers. Concerning the open-ended responses, a semi-automated thematic analysis was applied based on hierarchical text clustering (Zhai and Massung 2016). After preprocessing, two corpora resulted for analysis, one of students' comments and one of faculty members' comments. Student corpus consisted of of 9894 sentences (positives = 3348, negatives = 4165, suggestions = 2381) and faculty corpus consisted of of 1506 sentences (positives = 563, negatives = 544, suggestions = 399).

4. Results

Student and faculty overall satisfaction with the individual dimensions of the remote examinations (briefing, examination simulation, examination methods, available time, technical and administrative support, examination platform) is depicted in Figure 1. Booth groups seem to be satisfied with remote examinations in total. However, faculty are cautious to repeat remote examinations in the future and less satisfied concerning the integrity assurance of the remote examinations.

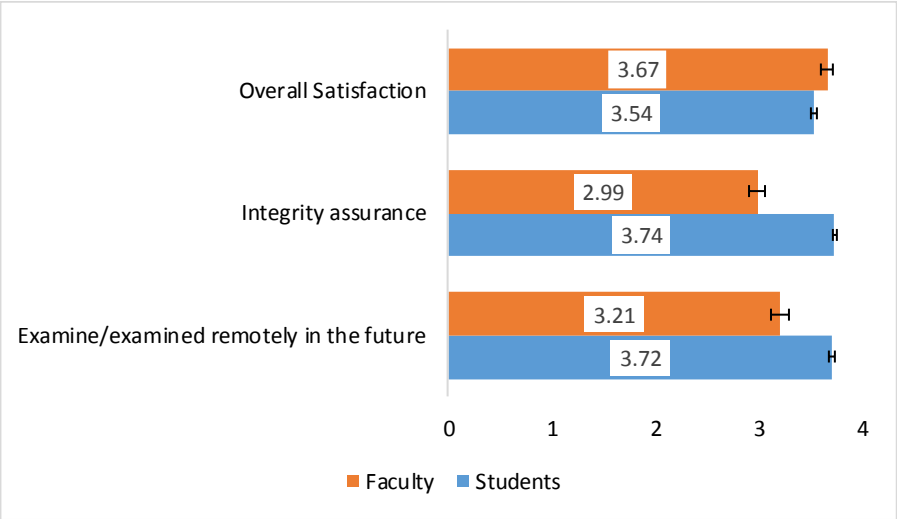

Figure 1: Means (95% Confidence Intervals) of faculty and students' evaluation of the remote examinations' process

As regards student and faculty satisfaction from each one of the individual dimensions of the remote examination process, both groups stated most satisfied with the examination platform, the examination methods and the briefing on the examination procedure and less satisfied with the technical support of the examination (Figure 2). A great divergence is detected in their perceptions about the available examination time, where students tend to be rather dissatisfied in comparison to faculty. What is more, students are satisfied with the examination simulation procedure while faculty are satisfied with the administrative support of the examination. In short, with mean values ranging above three, both student and faculty were satisfied from the dimensions of the remote examination process except for the examination time regarding students.

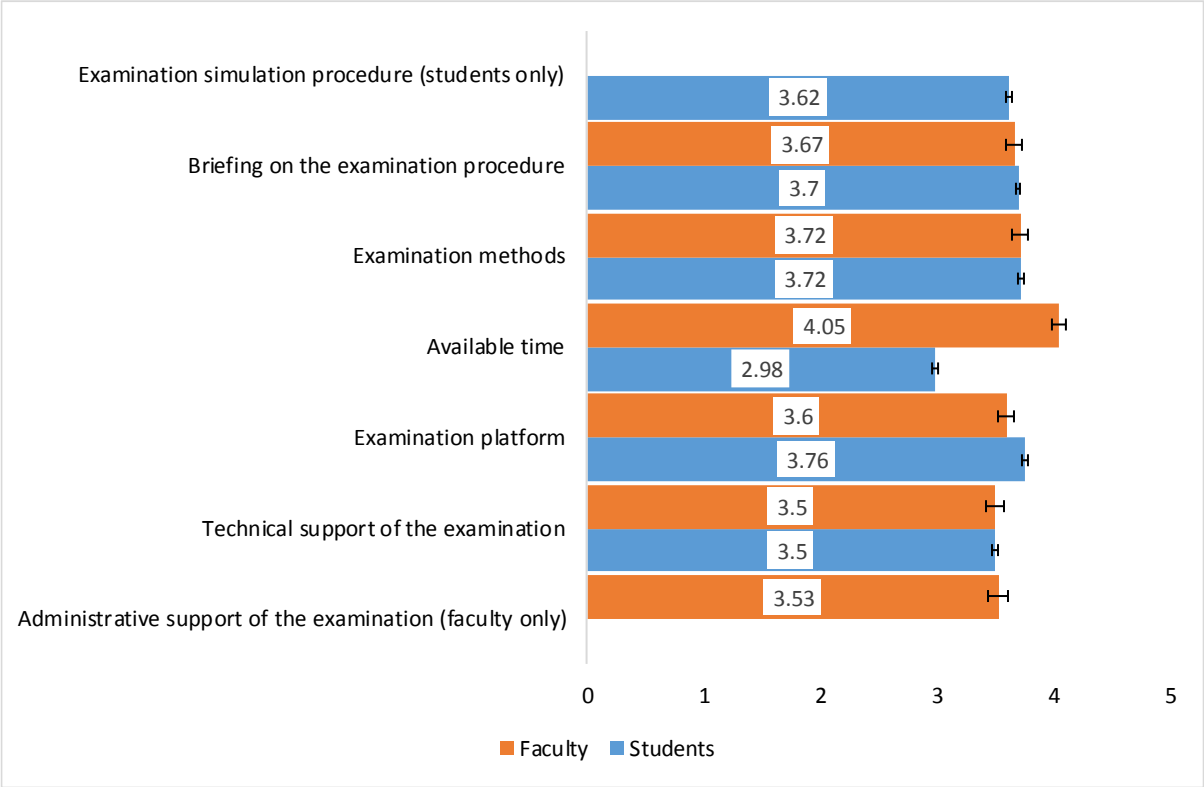

Figure 2: Means (95% Confidence Intervals) of student and faculty satisfaction with the individual dimensions of remote examinations

Considering student and faculty satisfaction from the examination methods, responders tend to be satisfied with all of them with mean values ranging above three (Figure 3). More specifically, both students and faculty were more satisfied with the examination methods “Written examination with MCQs”, “Final written assignment with potential oral presentation”, “Written examination with oral presentation”, and less satisfied from “Written examination with open questions” and “Written examination with MCQs and open questions”. However, faculty were considerably satisfied with "Oral examination", in comparison to students answers.

Regarding the integrity of the examinations, students tend to consider that it was assured (with mean values ranging from 3.61 to 3.9 – Figure 4) while faculty rather shows scepticism (with mean values ranging from 2.5 to 3.55 – Figure 4).

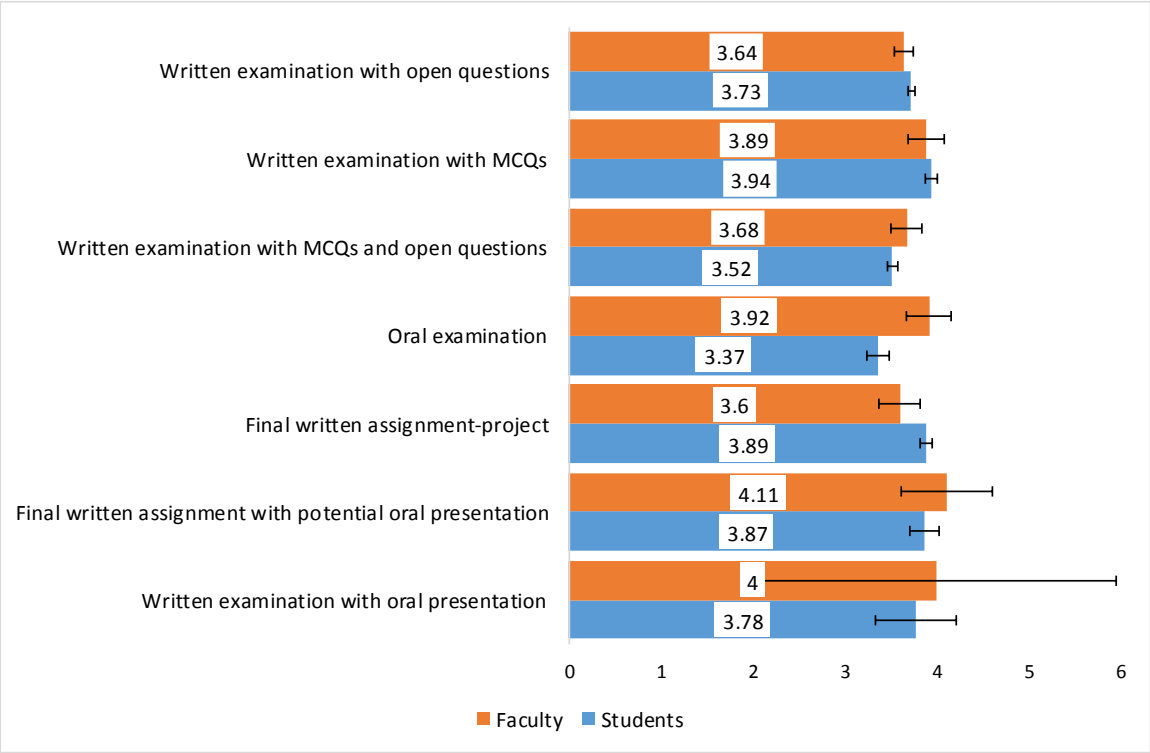

Figure 3: Means (95% Confidence Intervals) of student and faculty satisfaction per examination method. The number of faculty responses in written examination with oral presentation was N=2.

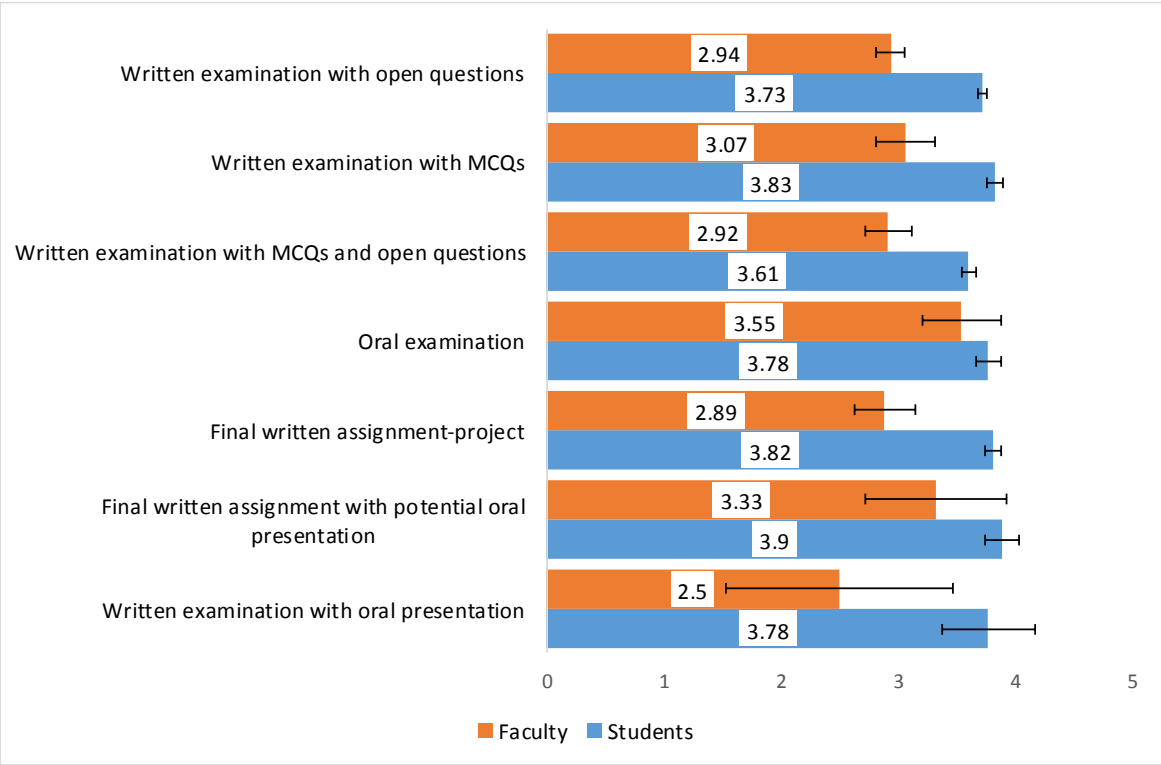

Figure 4: Means (95% Confidence Intervals) of the degree of integrity assurance per examination method, according to students and faculty

Regarding the positive and negative aspects of remote examinations, students considered a great benefit the fact that they did not have to travel to any examination venue and saved time and money (Figure 5). A large portion of students reported ambiguities or errors in the examination topics, ambiguities in their grading criteria, questions that were many or demanding compared to the examination duration, etc. For the topics that were delivered by the MCQs format, students reported the lack of going back and checking their answered questions before submission. Nevertheless, for a small portion of students, the examination topics were clear, comprehensible, logical in number, passable, they were given on time, promoting critical thinking, etc.). Students complained that the examination duration was not enough. Technical problems were also reported about the examination platform (e.g. difficulties in use, answer submission issues, etc.) and SfB (mostly poor connection issues that resulted in problems with student authentication, image freezing, disconnection from the virtual room, etc.). In general, students had the impression that technical support was not enough. Nevertheless, a small portion of students did not encounter any technical problems. Even in cases where technical problems occurred, those were addressed timely. Most of the students felt benefited from being examined in their private space with comfort and without stress. However, a portion of students stated that during the examination they were anxious for reasons like the technical problems in general, the fear of connection loss, the limited examination duration, the unprecedented examination process, etc.

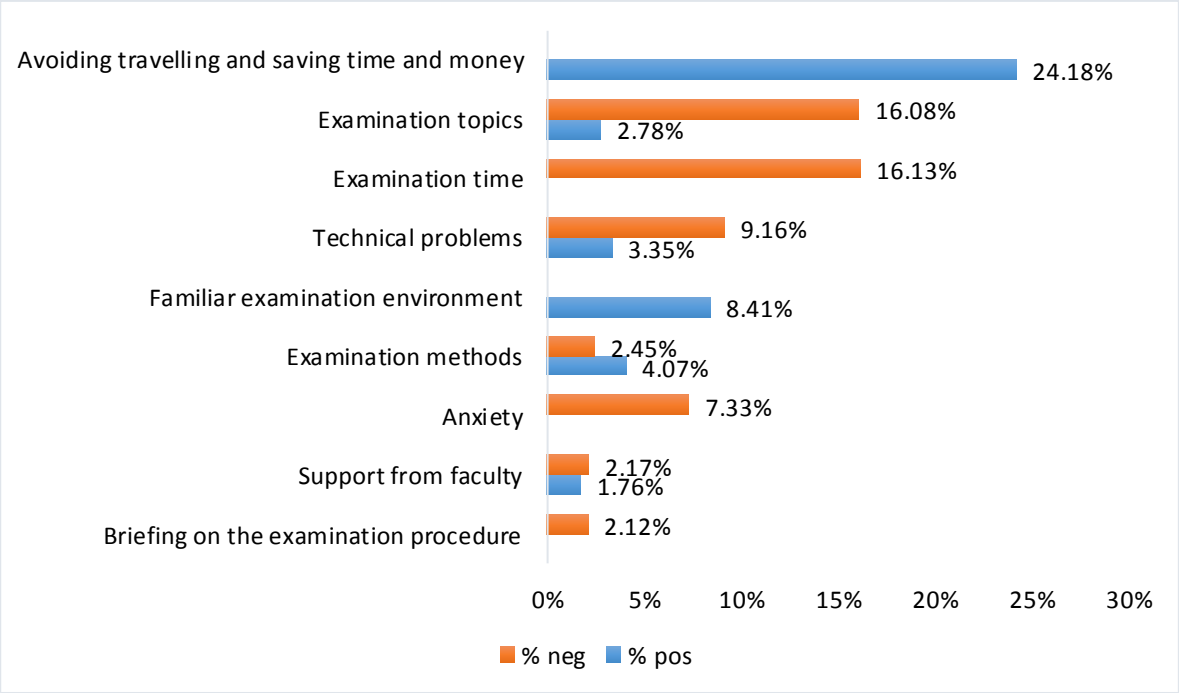

Figure 5: Aspects of remote examinations according to students

The examination methods were suitable for the course, easy, fast, transparent, fair, etc. For a portion of students, the “Written assignment-project” and the "Written examination with open questions” methods were considered as appropriate methods which promoted critical thinking. However, a small portion of students commented that the examination methods were inappropriate, not satisfactory, not representative of students' learning process, stressful, etc. Students’ positive and negative perceptions of support from faculty during the examination were distributed in approximately equal proportions. On the one hand, they stressed the fact that faculty members were cooperative, supportive, organizing, well prepared and provided ongoing information. On the other hand, they highlighted cases where faculty members were distant, disorganized, not at all properly informed about the examination process, unable to imposed order during the examination and lacked knowledge of the available technologies and processes. For the briefing on the examination procedure,

students stated that they had not timely or complete information either before (e.g., types of questions to be given) or during the examination process (e.g., exact starting time, available time, etc.).

Faculty expressed concerns about the degree to which the integrity of the examinations was assured (e.g. that it was difficult or impossible to fully ensure that some students were not allowed to copy -although invigilation occurred - that the adopted invigilation method was not always sufficient, etc.) (Figure 6). Faculty considered that distance examinations contributed significantly to the avoidance of students' travelling to the examination venues as well as to the reduction of travel costs and time. Furthermore, remote examinations helped to reduce student stress as students could participate from their familiar environment. The protection and safety of participants' health (both students and faculty) were also estimated as an important positive aspect of remote examinations. A portion of faculty expressed their satisfaction with the examination process either in total or for particular aspects (e.g. the absence of technical problems, the effective technical-administrative support, the appropriate examination methods, the quick grading in the case of the examinations with MCQ format, the synthetic, critical and creative nature of the examination topics, etc.). Faculty considered to a lesser degree that there were various technical problems during the exams, such as student connection problems, problems with topics' comprehension, problems with the answer submission (especially in the case where files had to be uploaded), authentication problems, etc. In parallel to the aforementioned issues, a portion of faculty considered that distance examinations caused stress to students due to the fear of possible technical problems or the occurrence of technical problems during the examination, the unprecedented character of the examination process, the lack of digital skills (e.g. fast typing), etc. Finally, a small portion of faculty considered that the available examination time was limited either in general or concerning the volume of the topics and students' digital skills (e.g. typing answers). In addition, some of them referred to the limited time they had at their disposal to prepare for the examination topics. Also, it is worth noting that some faculty members complained that the examination time was more than enough.

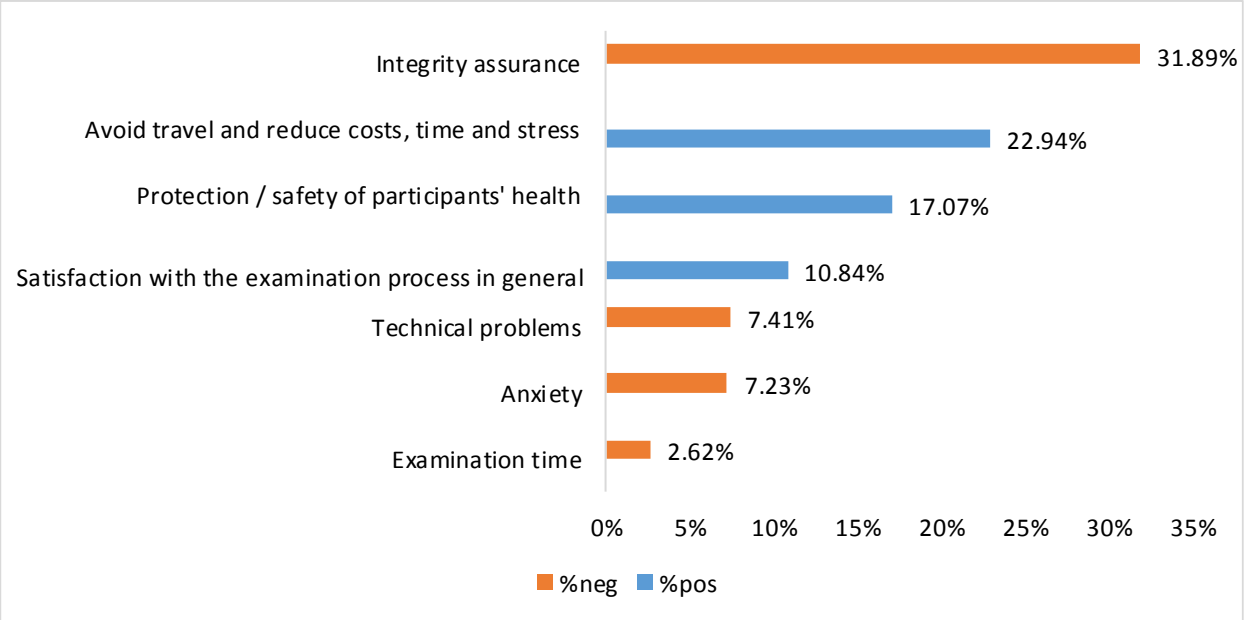

Figure 6: Aspects of remote examinations according to faculty

Students suggested a variety of improvements to the examination methods and topics (Figure 7): examination topics should be fewer, the distribution of examination duration and examination topics should be rational, examination topics should be all accessible from the beginning of the examination, etc. Regarding the

examination methods, some students want only MCQs, while others want to be examined with more than one method or with end-module assessments exclusively, etc. Concerning the examination duration, students want it longer, while apropos of the university affordances, students want better platform capabilities (e.g. simplification of the submission procedure, data recovery, notifications about the remaining time, etc.). Students also want better preparation on behalf of the institution: they want timely and complete information about the procedures they have to follow for preparing their participation, more realistic simulation scenarios delivered on time and customized to their examination mode, etc. Only a few students wanted to participate exclusively in traditional, pen-and-paper examinations.

Most of the faculty members' suggestions concerned improvements in the integrity assurance of the examinations (Figure 8). Faculty suggested the use of proctoring systems, the use of more than one camera in student's place, the use of video conferencing software that allows monitoring simultaneously a large number of people, the capability of browser locking, the shuffling of MCQs, etc. Faculty also made suggestions for the better preparation of the remote examinations in the future, such as the timely and valid information of all involved in the exam process, the clarity and completeness of the relevant instructions, the provision of real scenarios to familiarize students with the examination process, the training of students in the use of examination systems, etc. Faculty considered that the examination platform should be improved (e.g. ease of use, comprehensibility of its functions) and upgraded technologically to avoid problems during examination. They also felt that examinations should be better supported primarily at a technical and secondarily at an administrative level. Faculty want a reasonable distribution of available time and volume of topics, an appropriate time duration (longer or shorter) suited to each examination method, etc. A small portion of faculty suggested the use of MCQs in future examinations, either as a sole examination method or in combination with other methods. Faculty also suggested improvements on the examination topics, such as the creation of a topic bank, the topic shuffling during the examination, the grading of the topics to difficulty levels, the creation of topics suitable for distance examinations, the promotion of critical ability, and so on. Some others suggested as a preferred examination method the oral examination either alone or in combination with other examination methods. Finally, a small proportion of faculty suggested that examinations should be conducted exclusively face-to-face with the traditional pen-and-pencil method, because this method either guarantees the integrity and quality of the examinations or it cannot be displaced by remote examinations.

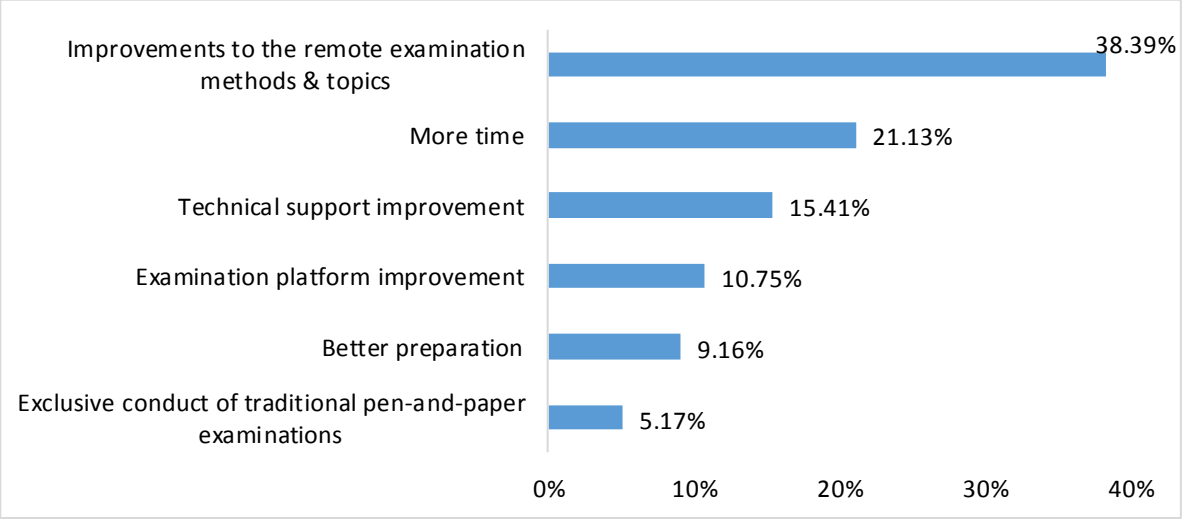

Figure 7: Students' suggestions for the improvement of remote examinations

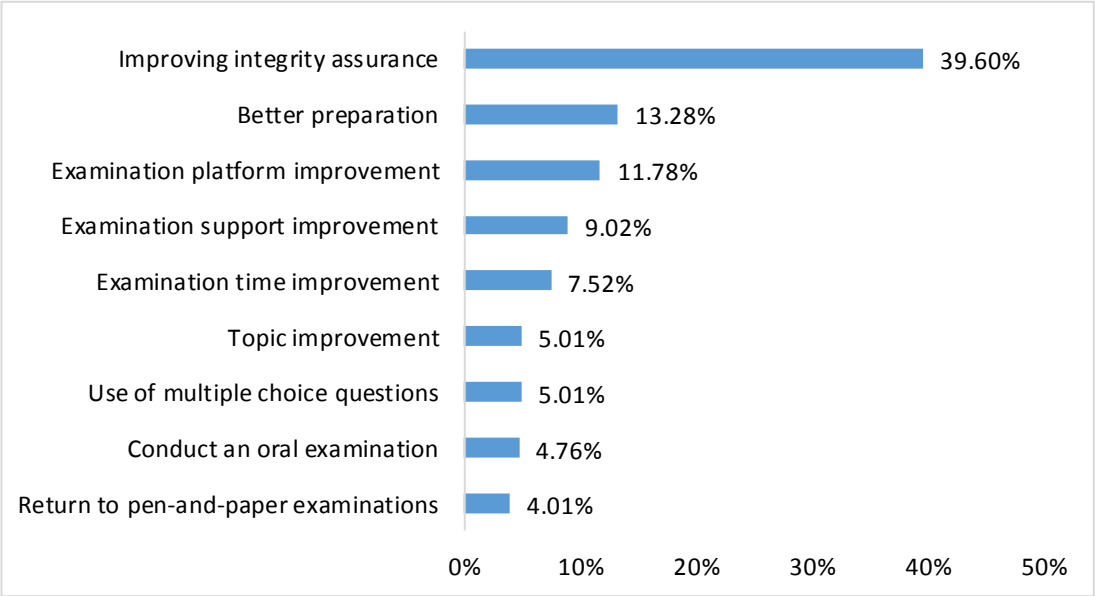

Figure 8: Faculty suggestions for the improvement of remote examinations

5. Discussion

Results showed that faculty members and students were satisfied with most of the dimensions of the remote examination process. Avoiding travelling to the examination venues, saving both time and money and reducing anxiety were for both groups significant benefits of the remote examination process. These findings are in agreement with Omidian and Nedayeh Ali (2015), Shraim (2019) and James (2016). Additionally, faculty stressed the fact that remote examinations assured participants' protection from COVID-19. However, faculty seem to be cautious to examine remotely in the future and less satisfied with the integrity assurance of the remote examinations. Most of the faculty comments concerned preservations on the degree to which the integrity assurance was achieved. Such preservations seem plausible because faculty members, as literature shows, tend to believe that cheating is very easy for students in online academic environments (Reedy et al., 2021; Schmidt, et al. 2009; Wiley 2020). Faculty made suggestions for improving remote examinations in the future like the use of proctoring systems, the use of more than one camera in students' place, the locking of the browser, the shuffling of MCQs, the utilization of critical thinking questions, etc.

Examination time was a controversial issue between the two groups. Students believed that the examination time was not enough because of the inappropriate content of examination topics, the inappropriate examination method, the technical problems, the lack of digital skills, etc. Thomas et al. (2002) refer that factors that might result in a loss of time like slow typing, orientation, gaining access to the exam, periodically saving answers, etc. are major issues for all students. Also, Ilgaz and Afacan Adanır (2020) mention time wastage issues in the case of mathematical online examinations where students had to use both paper and pencil and computers to solve the problems. More examination time is a demand of a large portion of students, a demand also reported in the literature (e.g. Khan & Khan, 2019; Ilgaz & Afacan Adanır, 2020). A small portion of faculty seem to acknowledge the aforementioned time issues on behalf of students, nonetheless, the majority was satisfied from the examination time. Faculty in general seem to pay great attention to online examinations' duration considering it as a factor that can enable or minimize cheating behaviours (Ng, 2020; Reedy et al., 2021).

HOU students stated problems with the examination topics like ambiguities or presentation errors, a large number of topics compared to the allotted time, etc. Jimoh et al. (2012) have shown in their research that

errors in questions were according to students one of the major causes of their failure. Walker and Handley (2016) also report the issue of balance and volume of questions per allotted time that was highlighted by students during examinations. Both students and faculty were in general satisfied with the examination methods that were adopted by the university administration. Additionally, students' answers varied in their preferences of being examined in the future. A portion of HOU students suggested being exclusively examined with MCQs. In literature, MCQs have been proved as an effective and fair mode of e-assessment and examination in general (Babo et al. 2020; Ranganth, Rajalaksmi, and Simon 2017). Another portion of HOU students prefers to be examined with a combination of questions such as MCQs with open questions, etc. Furthermore, some HOU students suggested being examined exclusively either with an additional written assignment / end-module assessment or with written examinations in general. Such preferences should be further investigated concerning the dissatisfaction expressed by some HOU students for the examination modes but also with respect to the subject of the courses to which HOU students attended during the particular academic year. Khan and Khan (2019) in their research refer that participants complained that MCQs did not truly test their abilities in the course and suggested that a variety of question forms should be incorporated into their assessment (e.g. long or short answers). Similar results are reported from Shraim (2019) where responders considered as an aspect of the effectiveness of e-exams the presence of different questions types. Iannone and Simpson (2017) relate the preference of examination method with the academic discipline and mention that in their research the students of education studies tend to prefer methods like projects and dissertations in comparison to the mathematics students who tend to prefer closed-book exams.

Both students and faculty referred to several technical problems during the examination process, such as poor connection, submission issues, usability issues etc. Similar problems are also reported in the literature (see theoretical framework above). In Ranganth et al. (2017) participants state that such problems make exams impractical. Both groups suggested better platform affordances and better technical/administrative support. Furthermore, both groups suggested better preparation on behalf of the university. Literature has shown the need for elements that contribute to students' better examination preparation, such as clearer instructions (Hillier 2015), more training and practice (Washburn et al., 2017), more digital skills (Adegbija, 2012; Walker & Handley, 2016), more resources and facilitating procedures (Shraim, 2019).

Anxiety during remote examinations was a challenge for a portion of students and faculty. Both agreed that it was mainly caused due to the fear of potential technical problems but also due to students' inexperience with remote examinations, time limitations, inadequate technical support, etc. Those findings are verified in the literature, where the potential failure of answer submission (Khan and Khan 2019), the fear of losing data (Pagram et al., 2018), inexperience with online format (Khan and Khan 2019), connectivity problems (Ilgaz and Afacan Adanır, 2020) and inadequate support (James 2016) are included among the most stressful factors during electronic examinations.

The lack of support from faculty was mentioned by a small portion of HOU students as a drawback and it is also reported in Khan and Khan (2019) where students stated that teachers were not well trained with online learning techniques and that had a negative effect on them. Khan and Khan (2019) also refer to students' complaints that online assessment decreased communication with teachers, which was valuable to them because each one of them has unique needs and require encouragement to be able to succeed.

6. Conclusion

The purpose of the present research was to record and analyze faculty and student's perceptions of the implementation of remote examinations by the HOU during the COVID-19 pandemic. The research was

conducted by the Internal Assessment and Training Unit of the HOU with two samples of 9.276 students and 884 faculty members respectively participating voluntarily. Findings showed that both groups were satisfied in general with most of the dimensions of the remote examination process. Avoiding travelling, saving money and reducing stress were the main benefits mentioned by both groups. Students complained about the examination topics and the examination duration and they suggested relative improvements. Faculty were less satisfied with the integrity assurance and expressed their preservations as well as their suggestions on the issue. Whether the HOU will return wholesale to pen-and-pencil examinations remains to be seen. The research findings of the present study aimed at informing decision making about the future implementation of remote examinations at our university, as long as the COVID-19 crisis still hinders a full return to normality.

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Smart Gamification based on Multiple Intelligence Theory in STEM modules

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Abstract
Due to the Corona crisis teaching in higher education was shifted to online learning and has changed the lives of learners around the world. Students study in online courses from home and sit in front of technical devices all day. To get the students' attention teachers need to find new ways of teaching. Smart gamification allows the students to participate in many ways in the lectures. As *Gardener* states in the Multiple Intelligence Theory people have different intelligence types and need to be activated individually. Lecturers from different universities in Europe have come together to develop and exchange new methods to keep the students active during the STEM lectures and increase their motivation to study (*STEM=science, technology, engineering, mathematics*). Furthermore, students have the chance to collaborate in virtual mobility with students from Germany, Poland, Portugal, and Spain. A tool is needed that gets the students' attention with addressing different intelligence types *Gardener* classified, e.g. *musical, visual, verbal, logical-mathematical, bodily-kinesthetic, interpersonal, intrapersonal, naturalistic, existential*. With the *WBS LearnSpace 3D®*, which is a tool for online working academia, students and lecturers from different countries are brought together on a virtual campus which takes virtual mobility to a next level.

Keywords*:* multiple intelligence theory, smart gamification, motivation, stem, wbs learnspace 3D®

1. Introduction

In their search for ways to improve teaching, the authors of this article have come across the methods of Howard Gardner for multiple motivation (Gardener 1983 p. 60f; Gardener 1993; Gardener et al. 1996). This article briefly presents the methodology and discusses the motivational impact of the adapted approach. Furthermore, it should describe how the approach of Multiple Intelligence Motivation. The theory of multiple intelligences was developed or let us better say observed by Gardner in the early 1980s because he believed, that classical intelligence tests were insufficient to identify and appropriately promote abilities that determine success in life in different cultural settings or occupations (Gardener 1993; Gardener et al. 1996).

From this theory, Gardner developed suggestions for how schools or institutions of higher education should teach and nurture students' abilities. In the past, because Gardner's theory does not stand up to empirical scrutiny, it has been often rejected by scientific intelligence researchers like Weber, Rost, and Süß (Rost 2009

p. 112ff; Weber, Westmeyer 2001; Süß, Beauducel, 2011). Nevertheless, because of this criticism, the method seems to fit very well to solve several problems, which occur during the last two years of online homeschooling caused by the current pandemic restrictions and circumstances. A rise of resistance against online learning could be observed. If there exists multiple intelligence it should be possible to expand this attempt to a broader field of multiple motivation. Because motivation is the driver for the development of intelligence and fun is the key for lifelong learning.

2. Training for alternative Types of Intelligence

The theory of multiple motivation is not new and was used in several ways especially in the 1980s. However, can be seen in a new light in combination with the lack of motivation during the pandemic homeschooling and the decrease of stimuli. Howard Gardner understands intelligence as several abilities and skills that are necessary to solve real-life (genuine) problems or to overcome difficulties in a certain cultural environment. This includes the ability to recognize new circumstances and thus lay the foundation for the acquisition of new knowledge (Weber, Westmeyer 2001).

From a review of evolutionary theory, the study of so-called savants (people with insular gifts), and from the study of historically outstanding talents such as Einstein, Picasso, Stravinsky, or Gandhi, Gardner developed his concept of multiple intelligences, which he then expanded to include additional abilities (Süß, Beauducel, 2011). The first eight published types of intelligence can be described as follows:

2.1 Linguistic intelligence

Linguistic intelligence includes sensitivity to spoken and written language, the ability to learn languages, and the ability to use language for specific purposes. Successful lawyers, orators, writers, and poets are among those with high linguistic intelligence.

2.2 Logical-mathematical intelligence

Logical-mathematical intelligence includes the ability to analyze problems logically, perform mathematical operations, and investigate scientific questions. Mathematicians, logicians, programmers, and scientists make use of logical-mathematical intelligence.

2.3 Musical-rhythmic intelligence

Musical intelligence means the aptitude for making music, composing, and sense of musical principles.

2.4 Pictorial-spatial intelligence

Spatial intelligence includes the theoretical and practical sense, on the one hand, of the structures of large spaces to be grasped, for example, by seamen and pilots, and, on the other hand, of the more narrowly defined fields of space important to sculptors, surgeons, chess players, engineers, graphic artists, or architects.

2.5 Physical-kinaesthetic intelligence

Bodily-kinaesthetic intelligence contains the potential to use the body and individual body parts (such as the hand or mouth) to solve problems or design products. Representatives of this intelligence are dancers, actors, and athletes. However, this form of intelligence is also important for craftsmen, surgeons, mechanics, and members of many other technical professions.

2.6 Naturalistic intelligence

Naturalistic intelligence includes the ability to observe, distinguish, recognize, and develop a sensitivity to natural phenomena. This ability is important for naturalists, environmental specialists, veterinarians, and cooks.

2.7 Interpersonal Intelligence

Interpersonal intelligence has been called the ability to empathically understand even unspoken motives, feelings, and intentions of others and to influence their moods and emotions. This ability is an essential prerequisite for successful interaction with other people. Gardner sees these abilities as particularly strong in political or religious leaders, in skilled parents and teachers, and other counseling or healing professions. Interpersonal Intelligence is better known as Social Intelligence according to Wechsler (Dahl 1965).

2.8 Intrapersonal intelligence

Intrapersonal intelligence is the ability to understand and influence one's feelings, moods, weaknesses, drives, and motives. According to Gardner, these individuals have an accurate mental model of their personality that helps them anticipate their behaviors in various situations. Gardner means this internal, self-knowledge-based, helps people make correct decisions.

Interpersonal and intrapersonal intelligence are the basic building blocks of the theory of emotional intelligence as developed by Mayer and Salovey and later popularized by Goleman (Mayer, Salovey, Caruso 2002). Intrapersonal intelligence is particularly pronounced in writers, actors, and artists and has therefore a strong connection with the reactance and the ability to handle demotivation.

In addition to these eight forms of intelligence Gardener has identified, a further ninth, existential intelligence or spiritual intelligence, which is concerned with fundamental questions of existence. Representatives of this potential intelligence would be, above all, religious and spiritual leaders or philosophers.

3. Smart Gamification – Virtual Academy

To address all the different intelligence types of students, a solution for an appropriate teaching method during online classes is needed. Gamified tools usually stimulate different senses. That is the reason why a virtual academy is implemented. In the test phase, two modules/ their lectures were held in the world of the WBS LearnSpace 3D.

3.1 We build our virtual academy

The WBS LearnSpace 3D is a virtual learning and working world which allows students and teachers to come together on a virtual campus (WBS TRAINING AG). It is a software tool of the WBS Akademie, which is a new German education business. They offer training courses, open seminars, and further education to increase the career opportunities of workers. They specialized in digital learning and were awarded the eLearning AWARD 2018, the Digital Champions Award, and the HR Innovation Award.

Figure 1: e-Close Academia

With the WBS LearnSpace 3D® a virtual simulation of a learning environment can be offered to the students. In Fig. 1 and Fig. 2 the e-Close Academia can be seen. It enables teachers and students to conduct digital seminars and lectures in their virtual learning world. A virtual house, branded with the university logo, brings students and teachers on a virtual campus together, either in the house, on the terrace, or in the parking lot.

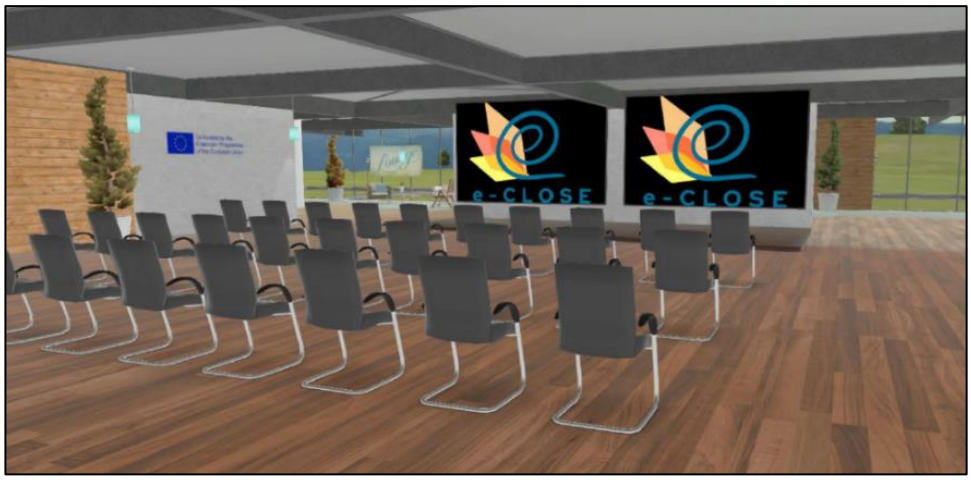

Figure 2: Welcome Hall

For international seminars, the e-Close Academia gives students from different nationalities the chance to come together online, no matter where they are located. The WBS LearnSpace 3D makes global digital collaboration an experience. With an individual avatar, participants move around in a building with a lecture hall, seminar rooms, and offices and communicate and interact with each other.

3.2 Use Case – Lectures in the gamified academy

As a first step two modules of the University of Applied Sciences Saarbrücken (htw saar) have been tested on the virtual campus in the summer semester of 2021. The teaching language was English. The engineering example modules are called Fluid Dynamics and Fluid Energy Machines and they are part of the bachelor's degree in industrial engineering.

Figure: 3: Starting our lectures in the auditorium of e-Close Academia

At the beginning of the first lecture on the virtual campus, the students got an introduction to how to get along with this software. When participants enter the house, they are placed in the foyer and can walk around. To find the auditorium where the lectures take place, they either walk the stairs or use the elevator to get to the second floor. After arriving in the auditorium, each student can choose his or her place on his or her own (see fig. 3). It was possible to use individual closes, characters, or even different sexuality. Additionally, during the lectures, even 3D models could be used for visualization.

The tool enables that 3D models can be presented in the middle of the auditorium. You can turn the object, so that you have a realistic view, how this model will look in reality. This is shown in Fig. 4.

Figure 4: Presentation of the 3D model of a rotor model for turbocharging

Additionally in Fig. 4, one can see how the lecturer sees the students during the lesson. Due to the reason that Fluid Dynamics is a technical module, 3D models are developed to simulate how the fluid passes an object. Hand calculations can be made on whiteboards in the auditorium.

Figure 5: Exams and students final presentation

During the semester students had to present different topics for their exams. In Fig. 5 this situation can be seen. For smaller meetings, the offices on the first floor, the lounge area on the ground floor, or the terrace next to the auditorium can be used. Fig. 6 shows a project meeting on the terrace. A whiteboard can be used to take notes or to visualize aspects. The relaxing effect is promoted by the singing of birds and several garden sounds on the terrace.

Figure 6: Project meeting on the terrace

Finally, after the lesson is over the students can clap and thank the teacher for the lesson as in Fig. 7. Usually, in real life, the students would knock on the table. The clapping function in the virtual system addresses this situation and can easily be shifted to the virtual world. Also, social interactions between the students are possible and wanted. If the distance between the students is closer they can hear each other louder.

Figure 7: Final Applaude for everyone's participation during the lecture

In the next semesters, more modules will be integrated into the WBS LearnSpace 3D®, so that students of all four universities have lectures on the virtual campus and can connect.

4. Conclusion

Student skepticism about the WBS LearnSpace 3D® disappeared after the first coaching sessions and was perceived positively by the students in the postgraduate course and compared to lectures of other courses. The feedback of the students was that the time passes much faster because of the different small stimuli during the lectures. Also, interaction with other students promotes motivation. Additionally, it was a new tool and it was fun to walk around at the virtual academy and meet classmates on the way to the lectures.

This new software online tool gave the possibility to add additional stimuli desired by Howard Gardner to the virtual world of online homeschooling.

Finally, it should be noted that the early test phase was done together with our Erasmus guest students from Finland (University of Helsinki) together with German Students from htw saar who gave us very valuable feedback.

5. Acknowledgment

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Technological change as a force for good: when the Jedi get working

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Abstract
The implementation of a new digital assessment system at the Open University (OU) marked the start of an ambitious programme of work that put the student experience at the heart of its vision and structure. Assessment design, operations and policies, the user experience of students, markers, and the development of technology became key drivers for the design and structure of the programme, and a future operating model. UNIwise was chosen to provide the technical solution.

This paper discusses the work of the Exams and Assignment Impementation programme since January 2020. Changing the way we assess 175,000 students on 500 courses, with close to 750,000 assignments marked by over 4000 tutors in a year, is complex, and requires careful stakeholder engagement and sensitivity to established practices. Two further university large-scale change programmes running simultaneously, and the Covid-19 pandemic, added to the challenges.

We share some of the obstacles and how we addressed them. We explain the vision, structure and communication strategy and their impact so far. We also discuss how we built partnerships with key stakeholders, while developing a 'true' partnership with our technology provider UNIwise to enhance the possibilities of the new system. This is likely to deliver win-win solutions within a multi-stakeholder context with students at the centre, and, in time, also new ways of assessment at the OU. In the process, we are creating communities of practice, starting with a group of "WISEflow-Jedis" who will, we hope, tap into the 'force' to make digital assessment a lasting success.

Keywords: assessment, digital innovation, educational technology, academic communities, change.

1. Introduction

In 2019 the Open University (OU) procured a new digital assessment system, WISEflow, provided by UNIwise. It would replace a well-established assignment submission system developed by the OU and used by students and staff since 2001. WISEflow would also replace a complex set of other systems used for the management and administration of assessment. A programme team was brought together, led by the authors of this paper in the roles of Programme Manager and Academic Lead to manage and deliver this significant change for one of the largest distance learning organisations in Europe. The programme was named 'The Exams and Assignment Implementation' (E&A) and formally started its work in January 2020, just weeks before the start of the pandemic and much of the world went into lockdown.

E&A was not the only institutional change programme happening in the OU at the time. The largest Information Technology (IT) systems change in the 52-year history of the OU was also in progress. The Core Systems Replacement (CSR) programme, as it is called, will introduce major changes to the OU's technology

architecture by transforming the digital foundations of the whole University. Much change will happen at the back end, but it will also visibly impact every single one of our 175,000 students and all staff at the OU. WISEflow therefore needs to integrate both technically and from a user experience perspective, and it needs to do this with two systems for a time: the existing technology and the new CSR systems that are being explored and implemented in parallel. A second large change programme in progress implements a new contract for the OU's 4,000 Associate Lecturers (AL) that tutor and support students. The new contract discontinues discreet per teaching module remuneration and integrates the OU's teaching workforce into one academic community. The new AL contracts are permanent and have terms and conditions similar to other roles in the OU, based on extensive negotiations with staff and unions over at least 10 years. This change is significant, highly complex and also political, and the changes from the E&A programme will impact on this Associate Lecturer staff group in their day-to-day practice.

In establishing ourselves as a new change programme, we encountered resistance that was not unfounded. Many OU staff members were weary of further change, remembering previous strategic programmes of work that had not delivered the expected benefits. For many colleagues, it was a narrative of 'large-scale change equals change for worse' which is factually not true as there are several positive examples that could be mentioned, but which nonetheless impacts people's disposition. It was therefore important that we fostered genuine, honest discussions about the change we were introducing and, more importantly, that we listened. This paper tells the story of how we designed and established this change programme in an internally and externally complex environment, in a university that covers the four nations of the UK.

2. Building a new programme

The new programme team inherited a set of objectives that focussed on the immediate delivery of technology. We knew that our vision needed to be much more ambtitious and pedagogically driven if it was to inspire the support from staff and students and deliver the long term benefits of change. Without neglecting those initial objectives, we focused on a message that could unite OU staff and students i.e. *delivering a secure, robust and flexible platform that improves the student experience*. Figure 1 presents the vision at the centre and objectives of the new programme, as communicated to the insitution.

Figure 1: The vision and objectives of the E&A programme.

In developing and sense checking the relevance of our vision we looked at our external environment, too. Digital assessment is a fast-developing area of interest for Higher Education Institutions (HEIs) in the UK and across Europe. We also started seeing the impact of the pandemic. Our thinking was informed by studies on digital assessment, for example two JISC[1] reports, one published in February 2020 proposing 5 principles and 5 targets for the future of digital assessment (JISC, 2020), and the other published in May 2021 focusing on how we can progress from quick fixes implemented in the pandemic to future transformation of assessment (Iosad *et al.*, 2020). At that point we also started making connections with other HEIs in the UK that were implementing the same digital assessment system.

In developing our vision, we also reflected on what aspects of University work and life would be impacted. We understood that we had to use this change as an opportunity to re-think the way we did assessment (Skelton & Taylor, 2020), including our processes and ways of working. We identified the following key areas:

1. Assessment policy and operations
2. Teaching practices
3. IT systems and support
4. User and learner experience

Those four areas together with 'Communications' and 'Programme Management, Governance and Evaluation' formed the six main workstreams of the programme. Each workstream was assigned a lead and these leads,

[1] **Jisc** is a United Kingdom not-for-profit company whose role is to support institutions of higher education and research, including post-16 education. It provides network and IT services, digital resources, relevant advice, and procurement consulting, while researching and developing new information technologies and modes of working. Jisc is funded by a combination of the UK further and higher education funding bodies, and individual higher education institutions ("JISC", 2021)

together with people who took on other support roles formed a 'core' programme team. It reflected a community of cross-unit roles that brought together diverse experiences, skills and behaviours and was one of the key assets of the programme. In this paper the pronoun 'we' is used to describe the collective thinking and activities of that diverse team that included experts in project management, assessment administration, communications, business change management, IT, digital student experience and other areas, led overall by the authors of this paper. Some ideas and actions were initiated by the two of us, but we always benefited from this group of exceptional professionals that came together as a team.

We focused on decision-making structures early on. We knew there would be challenging if not radical decisions that would affect embedded cultures of working. Our decisions needed to be informed by the grassroots and that we would not be able to go very far, if we did not have the support of our stakeholders, especially the colleagues and students that are directly affected by the implementation of the new system. We started by identifying key users of the new system e.g. students, markers, tutors and administrators. That initial mapping informed the membership of the two groups that formed the core decision-making structure. We kept the structure 'light' by working between two groups: Working Group and Steering Group. Our structure however acknowledged the fact that we needed to report or escalate issues to senior management as well as the fact that we needed to consult with other groups in the University depending on the nature of the decision (Figure 2). This internal structure remained stable and served us well up until now while the superstructures into which we report changed several times. Our internal structure could be said to have insulated the change work within the programme from the changes and challenges outside of it.

We also mapped and analysed our stakeholders across the University, an exercise that informed our extensive communications plan, working with experts from our Communications department. In this paper we use the term *stakeholder* as a proxy for a change project that is beyond multidisciplinary and affects a vast majority of teams and units across the institution and across the UK nations.

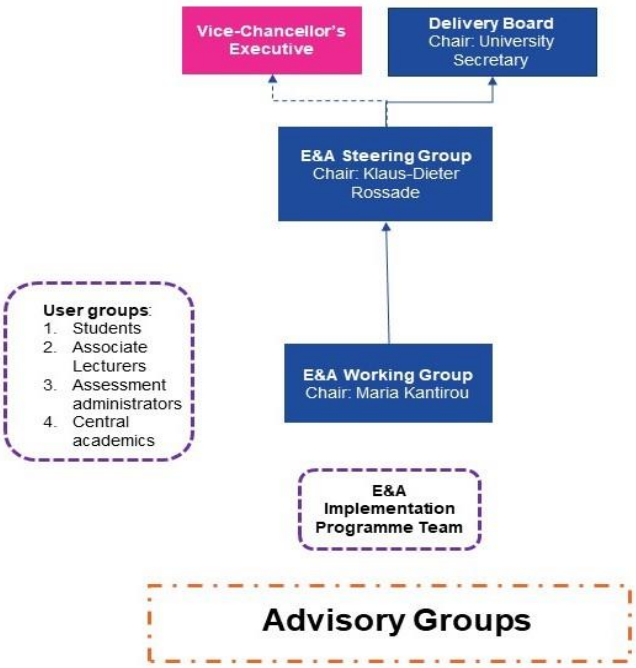

Figure 2: The E&A decision-making structure

Many of these processes will sound familiar and are common across change programmes in any organisation. What made our work in E&A different is the way we used unusual, left-field and, at times, quirky ways of connecting our stakeholders to the programme. This included direct but playful use of the new system itself. We addressed known anxieties towards new technology head-on by looking to the future of assessment, scanning our external environment and planning for change that goes beyond the technical replacement of systems and processes. We used academic expertise from within the organisation to garner support from the academic community and, most importantly, to actually deliver the change. That last deliverable is still in the future, but we believe that key building blocks and ways of working are set to achieve this.

3. Anxieties about technology

As a distance learning organisation, the OU has had technology in place for teaching, communications, and other day to day academic and operational work for many years. The level of expertise in using technology in education is high, not least because of the pioneering work of the Institute of Educational Technology (IET) at the OU. We have used computer-mediated communication in teaching for over two decades and introduced an electronic submission, marking and feedback systems for our Tutor-marked assignments at around the same time. Across the university, we refer to this as the eTMA system but that is almost proxy for several system components working together to facilitate the desired process around submitting, marking and feedback of student assignments. OU staff members that were involved in the change from pen and paper assignments, processed via postal services, to this eTMA system in 2001 remember the resistance and anxieties from colleagues at the time. Those anxieties were soon replaced with new marking and feedback practises and new ways of working that surpassed the quality standards of the past and considerably reduced the operational complexity. Two decades later, we have all become experts in using the system and associated processes. One might assume that a change from one electronic system to another would be experienced as a change in degree rather than a change in category, from paper to digital, as was the case in 2001. It was clear to us, however, that this would not be the case. We encountered strong resistance, compounded by what we saw as genuine anxiety of the new technology and uncertainty about the change it would bring. The anxieties were about technical affordances, ease of use, and about the changes to established working practices. WISEflow will replace outdated systems that are also not flexible and stable enough for assessment innovation, the assessment of the future, including online exams. Considering objectively all the changes WISEflow can deliver to the operations of all stakeholders, on balance, the benefits outweigh any negatives by a large margin. This did however little to lessen the concerns that those directly involved in marking and feedback raised with us repeatedly. We decided to address that perception head-on and this influenced how we engaged with stakeholders right from the start.

We, the core programme team, familiarised ourselves with WISEflow early on. We found it easy to use, well structured, yet sufficiently flexible. We also found in UNIwise a supportive partner to work with: UNIwise colleagues working together with the Open University were keen to be involved in direct discussions, even difficult ones, with future users of the system. Following an extensive user/stakeholder mapping exercise, we decided almost from the beginning to give our key users and stakeholders the opportunity to experience and explore the system.

We started with our Associate Lecturers, who would work with the new system more than most. ALs mark assignments but more importantly they teach our students through extensive, personalised assignment feedback - this feedback is a hall mark of quality in supported distance teaching and learning. Marking and

providing feedback in a pre-configured online environment with a limited set of mark-up tools was a significant change from the previous norm where most ALs used Microsoft Word for their marking and feedback, and other software or applications for more specialist subject areas. This was a valid concern about the change in long established working practices. It also reminded us of the change from paper to electronic marking when the latter was seen to be less flexible than marking up a script with a pen. There were also myths and misconceptions about what the software solution could or could not do and these were spreading within the AL community and amplified in their social networks. All this, together with a general anxiety about the new technology led us to forge a close relationship with our partners and make the *experience* of the new exam and assignments solution our key strategy.

In March 2020, just weeks after we came together as a new team and just as the first lockdown started, we recruited 40 ALs and tasked them with exploring the system using 'real' student assignments from past courses. They used WISEflow to access, mark, provide feedback and return assignments in the new system within 3 weeks. We deliberately provided very limited training, just a one-hour familiarisation with both the programme's objectives and the new system. We wanted to understand how intuitive the system was, what was missing in their first contact with the tool, and the extent and nature of training our ALs would require. ALs had to complete diary entries as they were working on the system and a questionnaire about their experience of using the new system. 18 participants were also invited to follow-up interviews. There was an important added benefit: engaging ALs early, actively and repeatedly at different stages of the programme we started building a community of practice within the AL community. Many of the 'early adopter' ALs soon became natural advocates of the system and the programme's work - not because they were told so, but because they had experienced the benefits. Their initial contact with the programme had also developed their trust that future work of the programme and further developments of the tool would close any gaps between what was needed and what was currently available. They spoke out in favour of the new solutions in online meeting forums or social media despite widespread negativity and often open cynicism about yet another system change. Speaking out against something that feels wrong is courageous, but so is speaking out for something that feels right, especially when you must stand up against your peers.

Practical experience becomes more powerful when it captures the imagination. For this, we decided to make the Working and Steering Group tasks look like a standard OU assignment as it would normally be submitted via the existing eTMA system. We hypothesized that a visual experience as close as possible to a real assignment would help members to imagine the future with the new system and that they would share these impressions within their networks and balance out in some way the spread of myths, negativity and cynicism in forums and social media. We wrote learning outcomes as we would for any TMA, devised a marking scheme and used standard eTMA templates. We even set up deadlines and a process for members to 'formally' request an extension if they were struggling with time. Importantly, we kept the assignment short and set a low word limit to signal that we respect people's time and workload. The questions were designed to offer the full range of practical experience in completing the task, uploading it to the system, receive email notifications and go back into the system to get the marks and the feedback. At the same time, the questions were designed to elicit comprehensive, rich feedback on key aspects of the programme, richer, more comprehensive and more inclusive than is possible at programme meetings. We set the following questions (word limits) for their task:

Question 1

(Word limit: 300 words)

Based on your current role in the OU, describe briefly what the E&A vision means for you.

1. *What are the strengths of the vision in relation to your role (e.g. Academic, Curriculum Manager, Academic Services, Associate Dean)?*

2. *What is missing or could be improved?*

Then take one aspect of the vision (e.g. enables delivery of OU assessment strategy vision) and explore its impact on your work or your team/unit. Be clear and explicit using carefully chosen examples where appropriate.

Question 2

(Word limit: 200 words)

What do you hope Assessment at the OU will look like in five years' time? How could the E&A system support this vision?

The 'mock' assignments were marked by volunteers from the Steering Group who gave the 'students' a mark and some feedback. The mark itself was of little relevance but it provided real experience. The feedback provided an opportunity for a dialogue as is the case in real assignments, even if not as extensive as our real students usually get.

We extended this model of stakeholder engagement through participatory WISEflow tasks to the University's senior management as concerns about the new system had started to escalate to senior leaders at the OU. Why should they not also experience the system first-hand, its limitations, and benefits? After all, this might be particularly informative for executive team members who had joined the OU from outside and had never experienced a TMA task. These WISEflow familiarisation sessions were aimed at the Vice Chancellor and his Deputy, the Faculty Executive Deans, Pro-Vice-Chancellors, the Directors of the UK Nations and senior leaders from the office of the University Secretary. Not everyone could find the time to engage with the task, but many did and showed great interest and enthusiasm. The assignment was tailored to their roles, with slightly different questions, but structurally the same as those for the Working and Steering Group. We focused their attention on our website and more specifically our vision. We also asked them to tell us what good assessment looks like and whether they buy into the benefits of digital assessment. We appreciated the level of engagement and the quality of feedback we received. More importantly, it demonstrated that senior management appreciated the hands-on experience and could be equally passionate about the future of digital assessment in the OU.

We continued using WISEflow as an engagement tool to dispel myths, gather feedback and help stakeholders familiarise themselves with the new system long before they had to use it. Over 400 'mock' assignments were submitted in 10 TMA tasks. We did not stop there with our stakeholder engagement though. Setting up mock TMA tasks for everyone in the University was not operationally possible. We launched, in parallel, a series of briefing sessions for various groups of users and stakeholders. In the first 6-8 months we delivered over 60 briefing sessions for academic unit, professional services staff and the students association tapping into their own meetings and events. In these sessions we talked about our vision, structure, governance and our methodology for implementing the new system. Sessions for key user groups e.g. members of the AL community and the students' association, included either hands-on tasks and either live or recorded demonstrations of WISEflow. In 18 months, we managed to achieve nearly 1500 contacts through our stakeholder engagement activities. Figure 3 is a slide developed by our communications experts to visualise the depth and breadth of our stakeholder engagement activities.

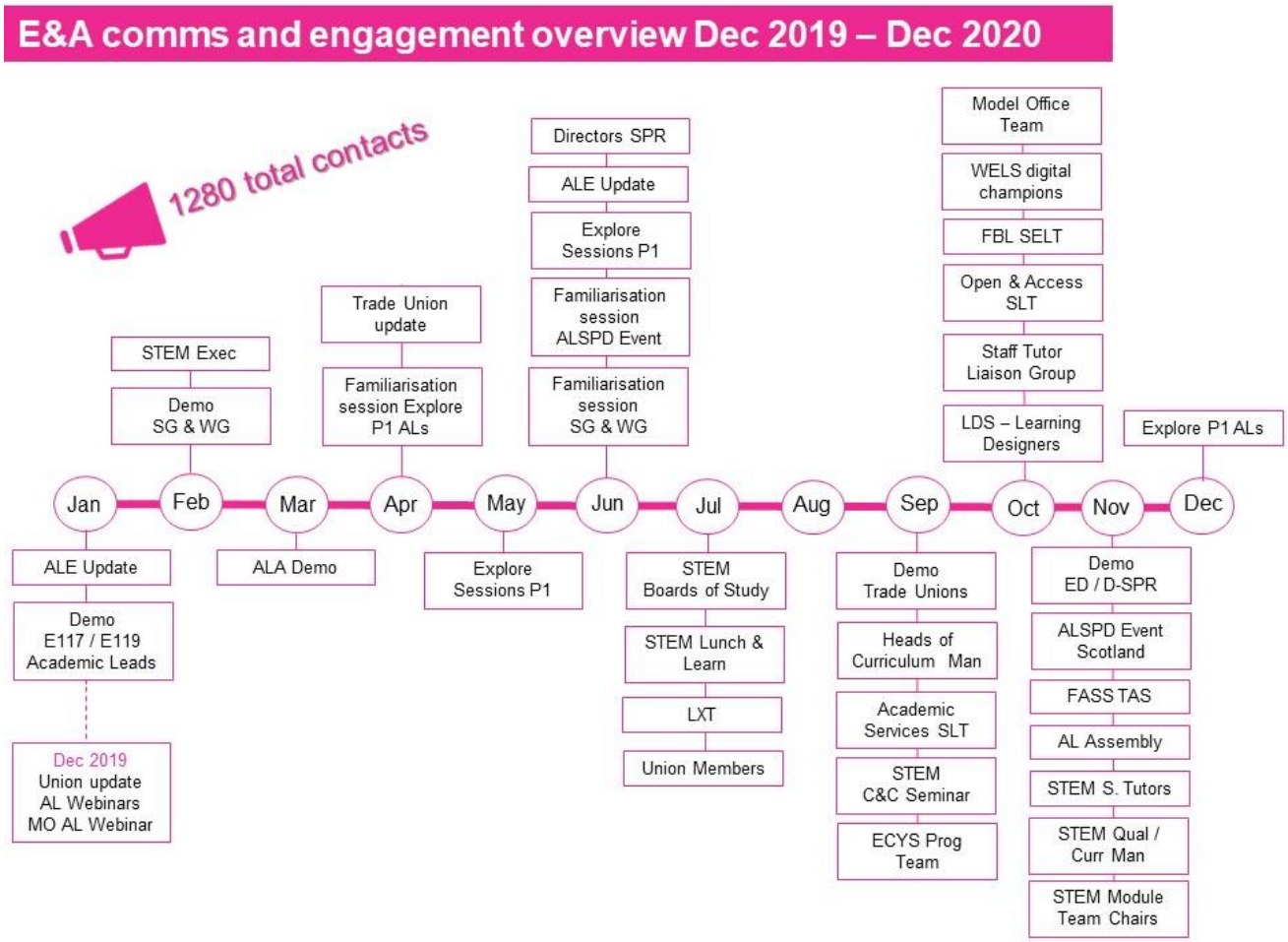

Figure 3: The E&A 12-month communications overview

Our extensive communication activities across the university community, with the new system taking centre stage, meant that within a few months, E&A had started building a solid reputation of a programme of work that is well-structured, ambitious and reliable. There was little doubt that E&A would in time deliver the necessary change that would impact every single student in the University and most of our staff. By then, the new system and the programme had gathered momentum and many advocates across the University.

We also used technology other than WISEflow in our stakeholder engagement. Starting our work only weeks before the first lockdown meant that we had to deliver all our activities via Microsoft Teams and Skype. In our Working and Steering Group meetings, we used a combination of group activities, splitting colleagues into break out rooms and using tools such as Padlet or simply the chat function in Teams. All this gave us much feedback over time, and particularly from naturally more hesitant or quieter members of the two groups. The pandemic forced us to reassess, and in the process to find ways that are altogether more equitable between the few vocal stakeholders that often dominate discussions and the remaining group members. That seemed like the best way to address the challenge of vocal stakeholders dominating discussions. Figure 4 is just one example of the group activities we run with our Working Group.

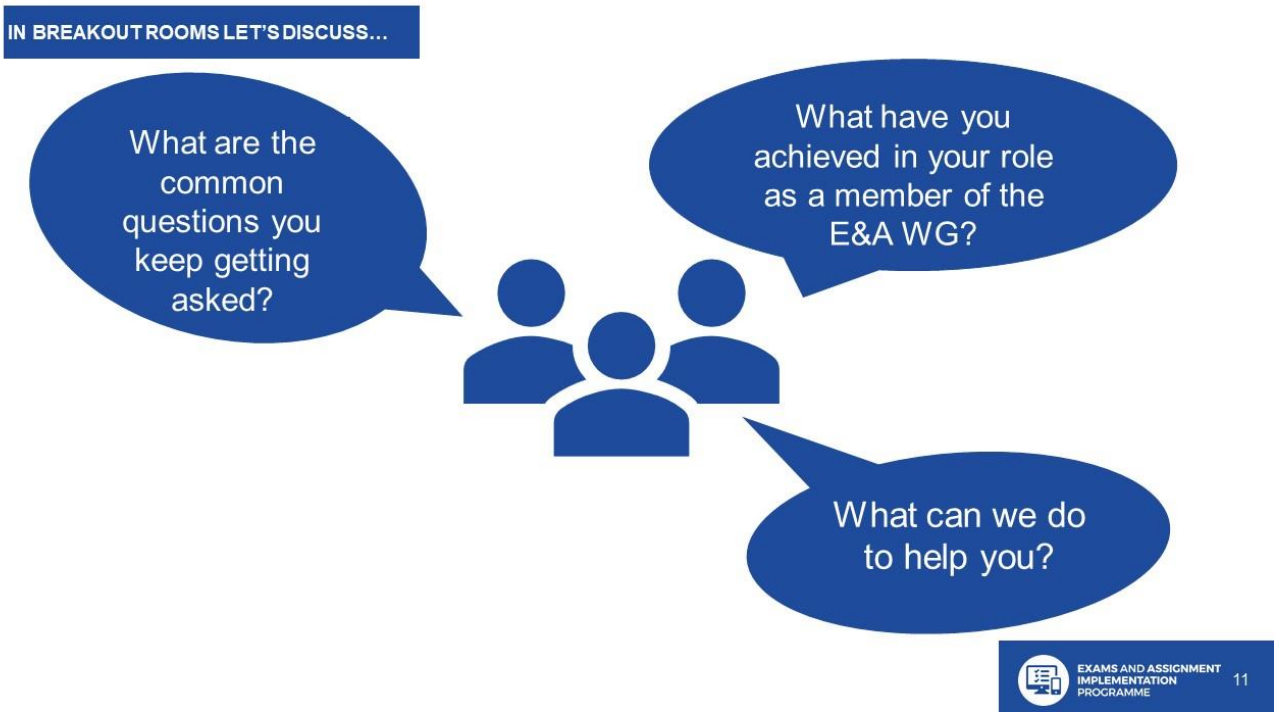

Figure 4: Working group activity example

Our Working Group involved representatives from a wide range of university roles. In some cases, the feedback we needed was role-focused, i.e., when we wanted to assess the extent and impact of specific changes in working practices for a particular user group; in other cases we needed the variety of roles reflected in each group, for example when we were taking stock of what we achieved as a group. By keeping the tasks varied and changing the composition of groups depending on the discussion item or activity, we turned routine meetings into more innovative, participatory opportunities for everyone.

4. The power of metaphors

The use of metaphors in change management is well established, as is the emotional impact they can have. While it has been suggested that they should not be taken literally, when used well they can "create effective messages and [help] to understand others' responses to change" (Smollon, 2014). Behind metaphors are stories and metaphors can therefore be seen as placeholders for stories from one context that are imprinted onto another context, thereby providing spaces for playful creativity. They can create shifts at the blink of a moment. A longstanding metaphor for the Open University and its supposed lack of agility for example is the container ship at sea - possible to turn around, but it takes a long time. The impact of a metaphor, how it catches on and energises people's imagination, depends on the story behind it. In technology change initiatives, 'digital champion' is a common metaphor for staff members who spread digital change across the university. The story of a champion is that of a person who is a proven and decorated top achiever, transferred to the digital expertise and the change this 'champion' is expected to instigate. 'Super user' is suggestive of the extraordinary abilities superheroes enact in their original context, transferred to the context of technology. An 'ambassador' for change grafts the diplomatic status, power, wisdom, mediation skills and much more onto another target context. The creative potential of a metaphor also depends on its freshness. All the common metaphors above, we felt, had been overused over time and become stale and perfunctory. We knew that the WISEflow implementation out into the Faculties needed a metaphor that was fresh.

When we considered a community of practice around exams and assignments, we thought of intensive and targeted discussions about the implementation of the new system and the future of digital assessment in the Faculties and other sub-units with the OU. Rather than bringing stakeholder representatives into our programme, we envisioned the programme work to be spread and developed locally across the university. We hoped for greater independence to generate solutions that meet the disciplines and Faculty cultures, but that remained connected through an OU-wide community of practice, supported by the programme. In one of our conversations with UNIwise, the idea of the 'WISEflow Jedi' emerged. Not everyone in the team was a fan or familiar with Star Wars but everybody could buy into the idea that a Jedi is someone that "aspired to attain a state of inner tranquility through calmness and meditation while avoiding emotions affiliated with the dark side of the Force" ("Jedi definition", 2021). It was another playful, quirky way of giving a unique identity to the academics that would volunteer to work with us in a challenging role. A few rejected the metaphor, but most welcomed the idea almost instantly.

To use academics time effectively, we made sure that the 'exciting' prospect of joining 'the force' was coupled with a detailed role description. A WISEflow Jedi will:

- help build an understanding of longer-term assessment vision and requirements for their discipline;
- identify the best ways of engaging their discipline and peers in exploring the new system;
- become first specialist users of WISEflow in their academic areas;
- start building an academic community of practice in their discipline and across the University.

We offered benefits, too:

- Opportunity to influence the future of digital assessment in the OU
- Opportunities for scholarship projects as well as professional development.

On a practical level, we managed to offer some back-fill resource for these roles. Having a concrete timeline in place to inform resource planning helped address the often-experienced obstacles to engaging academic staff with strategic change programmes.

After an initial induction session for the 25 Jedi that academic units had nominated, we engaged them, again, not through more meetings but through carefully designed hands-on tasks all delivered through WISEflow. They completed tasks both as students and markers/tutors using different workflows in the system, which offered them a flavour of how the system can be used for different types of assessment. Most of the Jedi became another group of advocates for the programme. Those not immediately persuaded by the possibilities offered at present, agreed to a different type of advocacy – to work with the programme and the system to get both right in the end. Their advocacy is one of spready confidence or hope in future capabilities and trust in the programme to deliver these.

5. Seeking out expertise - drawing in the academic voice

The Jedi and other initiatives gave academics a way to influence and steer our work. Much of the direction of work initially was from the inside out. Soon however we sought the flow from expertise and creative solutions from the outside in. The time and engagement from academics and other professionals and the influx of expertise was welcome and needed. After all, we were implementing a new piece of educational technology into an area of supported distance learning where the OU has great operational, teaching and research expertise. The more we could tap into this collective knowledge, especially the day-to-day experience of our Associate Lecturers and years of practice, but also over 50 years of operational experience in our professional

services units, the better this programme would steer in the right direction. As a programme, we engaged with many of the wide range of external professionals advising on project management, quality assurance, IT development etc. that were already supporting other projects at the OU. Our dedicated engagement with academic expertise and the voice of academics at the OU is perhaps an area where we took a slightly different path from a standard change programme approach; we approached and eventually worked with academics that specialised in the implementation of educational technology and in digital assessment from a teaching, research and operational perspective.

One way to tap into academic and professional expertise in assessment was to work the university's Assessment Programme which happened to be led by the academic lead for the E&A programme. The OU's Assessment Programme (AP) brings together a community of practice that seeks to improve and innovate every aspect of assessment that needs it. It involves both academic and professional services staff and we tapped into the expertise of these colleagues on many occasions. For example, we designed a workshop for the Assessment Programme where we invited academics from other institutions to talk to us about how the implementation of WISEflow had changed assessment in their institutions. That community offered a space for objective, constructive and forward-thinking debate on what we should be mindful of when implementing the new system. In effect, it transformed local scholarship and professional expertise in assessment and change management into a loose interuniversity network of HE assessment practitioners.

We also worked closely with academics from the OU's Institute of Educational Technology (IET), which is internationally known for its research on teaching and learning technology. In our user experience evaluation activities (e.g. the exploratory work with ALs described in Section 3), we were keen to use academically sound methodologies for the gathering and analysis of evidence. IET provided that expertise and agreed to independently evaluate the early user experience. They used well-established, peer-reviewed methodologies for evaluating the users' attitude to the new technology and published their report independently. There had always been vocal opposition to the new system by some ALs, but IET's evaluation overall showed that "user acceptance of the new system was positively related (significantly) with expectancy, attitudes, effort and self-efficacy and negatively related to anxiety" (Herodotou & Gillespie, 2020, p. 5-6). While challenges and missing features were identified and actioned to further product development, it was also hugely important to have such robust user experience evidence available early on in the programme. IET continue to work with the programme in ongoing evaluations and will continue to independently assess the success of the programme once the system is fully implemented.

Like any institutional change programme of this size and scope, we were regularly reviewed and audited from a financial and programme management perspective. However, we, the team, and many of our stakeholders on the Steering Group felt that such standard project management audit was necessary but insufficient for a programme with impact well beyond the technical implementation of a new software. We looked at our internal expertise, again, and approached an academic expert in learning technologies and social computing at the OU. She reviewed our programme management methodologies in-depth, including the process we were establishing for prioritising user requirements and working with our provider, UNIwise, to implement them. The outcomes of that review helped us establish robust processes for pedgogically-informed decisions about what we would like the system to look like in future. It also gave us evidence and a narrative for our negotiations with UNIwise, and it helped us justify financial investment decisions to the institution.

6. Discussion

Why does all this matter? Why bother doing all the extra work of creating mock-TMAs, provide hands on experiences, dream up new metaphors, foster communities of practice and seek expertise and programme checks that go beyond the standard project management processes? There so much else was going on at the OU and we all had to live through our individual and collective experience of the Covid-19 pandemic, all of which heightened a general feeling of physical and mental exhaustion? Why then invest all this time and energy? We all felt the exhaustion like everyone else, but as a core group, we also knew that leading change requires more that following established project management processes. It requires a change leadership approach that includes creativity, inspiration and preparedness to invest time. Above all, it was vital that we actively demonstrated that we really cared and listened.

> 'The thing is, caring takes time and energy. It takes time to ask how someone is and listen, really listen, to the answer. It takes time to help someone with a problem. It takes time to go to group events and take an interest in others' work. In fact, caring looks so inefficient, it is vulnerable to being cut altogether when we imagine new ways of doing things.' (Tapper, 2021)

We knew we needed to continue to listen and care. We knew that 'work to rule' for self-preservation was not an option. We also knew that adopting a system like WISEflow and further expanding the use of digital assessment was not an emergency stopgap (Barber, 2021) to manage our way through a pandemic. Widespread use of digital assessment is here to stay and at the Open University, it would be through the long-term partnership with UNIwise.

As we were approaching nearly 18 months since the start of the programme and with a new, much clearer delivery plan only recently approved by the University, it was time to take stock: we decided to ask our Steering Group about what they felt had worked well in E&A. This time, no elaborate process, just a question in the Teams chat and everybody writes what comes to mind. What had we all achieved together while removing or circumventing obstacles and facing ever changing challenges? We had faced and dealt with change cynicism and at times challenging behaviours from stakeholders. How much had we managed to convert the existing, often negative change narrative into something more positive and forward looking? We thoroughly welcomed what our Steering Group had to say.

As for our joint achievements we heard that we had established a "*much clearer idea of how the new system will work for our students and ALs in order to optimise the experiences and make it as simple and user-friendly as possible*" and also a "*really positive engagement with a range of stakeholders, with a focus on the student experience*". We also heard that we had introduced "*a positive way of working, maybe ground-breaking*" and more importantly that we "*brought people along with us*".

When we asked members to choose one thing that had worked well for them in E&A, we heard the following:

"*Meetings that finish on time!"*

"Openness and transparency of the challenges and the opportunities"

"Teamwork, openness, vision"

"A broader understanding of the end-to-end journey of assessment and the amount of effort across all units put into delivering this service to our students"

"Shared sense of purpose across the programme even if we disagree sometimes on how to get there."

In a final question we asked Steering Group members about the next steps and the future of the programme. We heard that there is *"trust in the programme team"* and that there was now "*a sense that we can change things in the university when we often tell ourselves that we can't*". There was also a strong message about continuing to progress the implementation in a transparent, collaborative way and that "*time is flashing by*", so we need to keep our eye on the ball and continue delivering our milestones.

7. Conclusions

When we took on our roles as Programme Manager and Academic Lead for the Exams and Assignment Implementation Programme, we both intuitively mistrusted the word 'implementation'. It seemed to signal that all the groundwork had already been done and all that was needed now was turning it into practice. Could that really be true?

We started our work with a list of requirements, a provider identified, contracts signed, and a minimum core programme team allocated. We decided to kick off our work with a joint Working and Steering Group meeting in a large room on campus in Milton Keynes, UK, with some 30 people in the room and another 10 joined remotely via Skype for Business. Getting everybody in the room and creating a baseline of a collective understanding of the vision and ways of working seemed like a promising idea. We had not prepared ourselves for technology almost totally failing us. We also did not anticipate the onslaught of comments displaying mistrust, cynicism and disbelief about this new end-to-end assignments and exams solution. It happened to be the last face-to-face meeting before lockdown. Following the change project management rule book was of course essential, but clearly, it would not be sufficient going forward.

This paper presented some of the steps we took to address the institutional obstacles and complexities at the Open University between January 2020 and July 2021. These included a strong vision and purpose that was communicated widely and reached over 1500 contacts. To address residual anxieties about using a new software application and more practical ways of engagement with it, we designed 'mock TMAs' which delivered that hands-on experience and gave us valuable feedback in the process. We used the Jedi metaphor that was fresh, invited new ways of thinking and the development of a community of practice in Faculties and other units in a creative way. Finally, we ensured that the academic scholarship and professional expertise from OU staff contributed prominently to the work of a programme; a programme that, after all, is there to give students a much-improved assessment experience and therefore greatest potential for success. Doing all this, we may have indeed navigated around 'emotions affiliated with the dark side of the Force'.

Most important in all this: while the paper was written by Maria (Programme Manager) and Klaus-Dieter (Academic Lead), the credit for the achievements must go to all who contributed to the creative energy present in regular programme meetings and the sometimes quirky and unusual ways of running and being in a Working and Steering Group. The commitment and generosity from everybody, and particularly from our partners at UNIwise who gave more than what might be expected from a technology provider, is the strongest evidence that change can be done, at the Open University and even during challenging times. Maybe we all became Jedis and called upon our 'inner tranquillity through calmness' to tell ourselves that we can do change, and then tapped into the force for good to make it happen.

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Tools, applications, and teaching methodologies in synchronous and asynchronous online instruction in TESOL courses

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Abstract
The paper presents the findings of small-scale research that was conducted in Greece and whose aim was to explore the impact of a course attended by postgraduate students at the Hellenic Open University (HOU) for the completion of their Master's in Education (MEd) in TESOL (Teaching English as a Second Language). Specifically, to receive their MEd in TESOL, students, who are practicing teachers in private or public schools and institutes of foreign languages, complete eight courses in blended mode, one of which is Course AGG31 "Educational Technology in TESOL". The research was conducted in late May 2021 and used an online questionnaire and interviews to collect data from 18 participants that attended the course in the spring semester of 2021. On the one hand, it investigated which applications and tools participants used in lessons they taught online in the COVID 19 quarantine periods (i.e., before attending AGG31). On the other, it explored which of the applications, tools, and methodologies they were instructed to in course AGG31, will use in future classes delivered fully online synchronously and asynchronously. It was found that participants, most of whom were already familiar with platforms of communication and collaborative tools before taking the course, now opted for the more innovative pedagogies and methodologies studied in the course (AGG31). Their main concerns concentrated on learners' digital etiquette and teachers' assessing new skills and knowledge in alternative ways.

Keywords: Technology and media-assisted language learning, language learning pedagogies, assessment, curriculum design, blended learning, platforms of communication, course management systems, synchronous & asynchronous e-learning, digital etiquette.

1. Introduction

Learning additional languages in Europe and Greece has a long tradition and has been well-established by the actions of the Council of Europe, which target at promoting plurilingualism, linguistic diversity, and language learning. The Council, which has been running language policy projects for the past six decades in Europe, has produced two documents, the Common European Framework of Reference for languages (CEFR) and the CEFR companion volume for learning, teaching, and assessment that provide the foundations for reflection and communication among language educators in the fields of teacher education, the development of curricula, syllabuses, textbooks, and assessment across the member states of the Council of Europe. The integration of educational technology and the new media in the two publications is prominent as they are being viewed as an indispensable component of the teaching practice and the learning processes. Teacher education programs at both undergraduate and post-graduate levels include specialized courses on the integration of new media and aim at training student teachers and practitioners in the exploitation of modern applications and tools to develop their learners' communicative skills and intercultural awareness. There is a variety of courses in Greece, which are delivered in different instruction modes, i.e., lectures and seminars onsite, distant education, blended learning, the flipped classroom, etc. One of these courses on educational technology is the one offered by the HOU (Course AGG31 “Educational Technology in TESOL”) which addresses practitioners

who are completing their Med on TESOL and is founded on the principles of modern pedagogical trends and up-to-date language learning methodologies. The research presented in this paper aimed at investigating which tools, applications, and teaching methodologies the post-graduate students who complete the specific course select for teaching English to their learners. Before presenting the context of the research, the methodology, and the findings, let us provide the rationale for integrating educational technology in TESOL and refer to its pedagogical orientation.

2. Educational technology in TESOL

Exploiting media for language learning purposes has been closely associated with English language learning for many decades. In 1983 the term Computer-Assisted Language Learning (CALL) was coined to describe language learning with the aid of computers (Chapelle, 2001). According to Beatty (2003), the term referred to the design of materials, technology, pedagogy, and modes of instruction. However, technology and media assisted language learning has progressed and is continuously evolving; it now encompasses social networking, platforms of synchronous and asynchronous communication, mobile devices that facilitate language learning across communities of practice as well as up-to-date modes of instruction, such as blending offline and online learning or flipping the classroom.

In modern language learning pedagogies, Electronic learning (E-learning) is underpinned by the principles of inquiry learning, task-based, and project-based learning. Learners are viewed as explorers of new knowledge, which is progressively built through collaborative tasks that encourage them to develop life-long learning skills. Specifically, language learning environments today are based on a combination of pedagogies but give priority mainly to socio-cognitive, social constructivist, and transformative orientations (Skourtou, Kourtis-Kazoullis & Cummins, 2006; Cummins, Brown & Sayers, 2007; Kourtis-Kazoullis & Skourtou, 2007; Kourtis-Kazoullis, 2008; Spantidakis, 2010; Kourtis-Kazoullis & Vlachos, 2014). It is widely accepted in the relevant literature that social constructivist pedagogy and ICT encourage learners to actively explore new meanings and become cognitively engaged in challenging, collaborative projects and group-work activities (Vlachos, 2020). Transformative pedagogy when combined with social networking and Network-Based-Language-Learning offers opportunities for collaborative critical inquiry that encourage learners to analyze, understand, and delve deeper into the social realities of diverse communities (Cummins, 2000; Cope and Kalantzis 2008; Vlachos, 2009). But how can social networking contribute to developing literacy in an additional language, which is one of the basic components of a language learning program?

Recent trends in language learning do not see literacy in isolation from new media literacies (Kalantzis & Cope, 2008; Vlachos & Papaefthymiou-Lytra, 2008; Vlachos, 2009). In 1996 the New London Group acknowledged the fact that 'the multiplicity of communication channels and the increase in cultural and linguistic diversity in the world today call for a much broader view of literacy than portrayed by traditional language-based approaches' (1996:60) and emphasized the need for 'multiliteracies' in people's working, civic and private lives without undermining the importance of 'traditional literacy'. Modern language learning pedagogies emphasize the fact that multiliteracies are being developed on the foundations of language skills and knowledge such as phonemic awareness, knowledge in the grammar and syntax of the language, vocabulary knowledge, inferential reasoning, producing well-spelled & coherent texts, etc, in other words, multiliteracies are built on the foundations of 'traditional literacy'.

Nowadays it is established that learners become literate by learning to read, to understand, and to interpret the words, the symbols, the graphics, the artwork, in other words, the semiotic symbols that synthesize nonelectronic and electronic multimodal texts (Coiro, 2003). In addition, they are considered literate when

they can communicate across different cross-cultural contexts, using the new media and various communication channels, but also when they collaborate to make common decisions, take initiatives, work effectively and behave accordingly within discrete educational, professional, and social settings (Belz & Thorne, 2006; Block, 2003). Language teachers are now required to be able to design educational scenarios and learning activities whose learning outcomes are related to information literacy, that is associated with learners' research skills on the web; media literacy, that is related to the critical analysis of online texts; digital literacy, that is connected with the ability to use social media, mobile devices, tools and applications; visual literacy, that is associated with translating the various semiotic symbols appearing on screen and, last but not least, community literacy, that is linked to the social skills that are necessary for expressing oneself and participating in cross-cultural collaboration (Papadopoulou & Vlachos, 2014). They are also expected to conform with rules of digital etiquette, such as adjusting the language they use depending on their audience, paying attention to grammar and spelling, respecting other people's feelings, explaining their reasons for agreeing or disagreeing, avoiding sarcasm, etc.

To conclude this section, in present-day language learning classes teachers are expected to exploit different media, applications, and pedagogies so that learners will be motivated, learning will be linked with life beyond the limits of the classroom and instruction will serve the purposes of communication in realistic circumstances. Let us now describe the context the specific research was placed in as well as the research methodology.

3. The context and the research methodology

Course AGG31 "Educational Technology in TESOL" of the HOU focuses on an in-depth and practical understanding of the different ways in which Information and Communication Technologies (ICTs) can be used in the teaching and learning of English as a second, foreign, and international language. The course, that counts for 15 ECTS (European Credit Transfer and Accumulation System), targets at (1) the development of skills for the use of modern ICT applications as tools in English language learning, (2) the use of modern language learning tools to support teachers' practice and, (3) the training of teachers in combining ICTs with modern pedagogical approaches and theories of language learning/teaching. The mode of instruction combines synchronous online meetings with self-study and self-access at home while at the same time flipping the classroom provides space for the trainee teachers to study the online materials and applications, which they later use in the synchronous online sessions to design learning activities and lessons for their learners.

Interaction between the trainees and the instructor or among the trainees is facilitated by the 'Discussion forum' and 'Blog' sections of the moodle platform, 'Facebook Messenger' or 'Whats App' groups. The duration of the course is fourteen weeks during which trainee teachers complete weekly tasks on the 'Discussion Forum' and the 'Blog' and submit two extensive written assignments on the design of learning units that employ the ICTs. At the end of the course, trainees present their assignments orally to the instructor and their fellow trainees and receive feedback that casts emphasis on the possibilities different applications offer as well as the pedagogies used.

The expected learning outcomes of this course is for teachers attending to develop an understanding of how technology is used to facilitate language learning, delve into ways of overcoming barriers to the use of technology and exploit it optimally, learn how to use resources such as video, self-access, the Internet and digital networking to develop their learners' language skills, learn how to evaluate software and learning activities that promote critical thinking skills, learning strategies and multiliteracies and become able to combine more than one social networking application and software in the context of creating work projects

and synthetic interdisciplinary tasks that enhance the learner's ability to grasp the meaning, consolidate knowledge and use the material taught in new situations.

A group of twenty teachers attending the Course AGG31 “Educational Technology in TESOL” participated in the research, presented in this paper. The purpose was (i) to explore which applications and methodologies teachers used in their lessons in the COVID quarantine periods (i.e., before attending the course), and (ii) to investigate which of the applications and methodologies they were instructed to, they will use in the future in classes delivered fully online synchronously and asynchronously. The researcher, who was the instructor of the group, had followed the syllabus of the course, and taught all the synchronous and asynchronous tasks; all written assignments had been completed and the participating teachers had been provided with feedback on tasks and assignments. An online questionnaire on Google forms was completed by eighteen teachers of the group, ten of whom participated in semi-structured interviews. The selection of those who were interviewed was random.

Questionnaires are one of the most frequent and popular tools used in research, as they can be easily constructed and can provide multiple answers within a short time (Dornyei, 2003; Mathers, Fox & Hunn, 2009; Thomas, 2009). The specific questionnaire, which was filled in anonymously, included three parts. The first part provided the researcher with demographic information as well as with data that referred to the age groups and language levels teachers taught during the pandemic quarantine. In addition, this part provided the researcher with data on the context and sector of education teachers taught (i.e., public or private schools, primary or secondary schools, centers of foreign languages, private lessons).

In the second part, whose title was “The COVID lockdown & quarantine period” the eighteen participants selected the applications they exploited for instruction, learners’ collaboration, assignments, and assessment. Furthermore, they indicated the ones they found more effective in language learning instruction but also those they or their learners found difficult to work with. Finally, in this part participants were asked if they had concerns about distance education in their teaching context and were invited to explain and justify their worries.

The third part of the questionnaire directed attention to teaching online synchronously and asynchronously in the future. In this third part, teachers were asked to imagine that the following year lessons in their teaching context (school; institute of foreign languages; private lessons, etc) would be realized online. They were required to indicate which of the applications they were instructed to in Agg31 they would use for instruction, communication, and learners' assessment and collaboration. They were also asked to justify their selections and explain why they would use what they had selected. Last, they were asked to decide among several language-learning methodological frameworks that accommodate educational technology (i.e., the pre-while-post stages framework, and/or the task-based learning and teaching framework for the development of language skills, and/or the project-based learning framework or more extensive educational scenarios for the integration of language skills, grammar, and vocabulary), and justify their selection(s) providing reasons that would reflect reality in their teaching situations.

The questionnaire was filled in the last synchronous online session after teachers had completed their oral presentations and the time allotted was thirty minutes. Except for gathering data for the research, filling in the questionnaire was used as a means for recapitulating the content of the course and raising awareness of the possibilities educational technology offers in distant learning. The two teachers of the group that did not complete the questionnaire had to leave the session earlier for professional reasons.

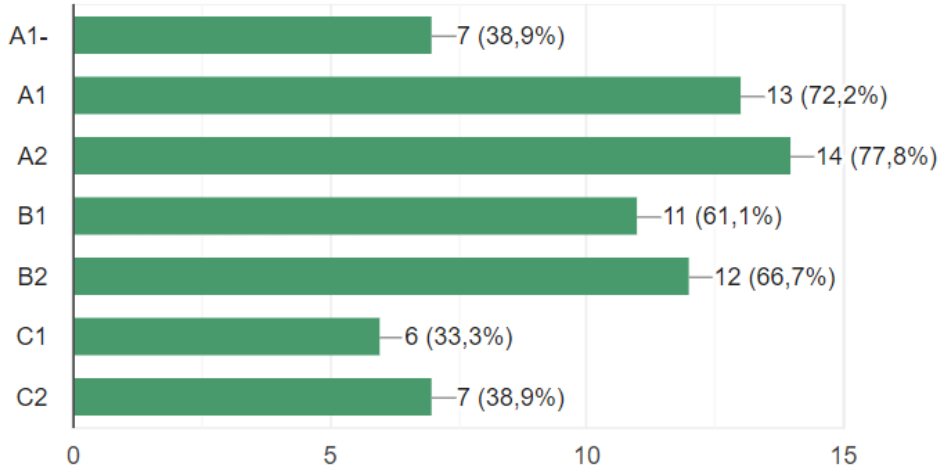
Semi-structured interviews are a common qualitative research tool as it is quite flexible and without a particular structure (Edwards & Holland, 2013, Galetta, 2013; Adams, 2015). The semi-structured interviews took place on WEBEX at hours that were convenient for the interviewees, who were asked to expand, comment, and elaborate on the answers they had given on the questionnaire. Moreover, the interviewees provided the researcher with feedback on the course, discussed and justified their selections, made extra comments and suggestions on the effective use of different applications and methodologies and related them to their experiences and teaching contexts. Last, emphasis was cast on their reservations regarding issues relevant to the effective integration of ICTs. In the section that follows we present and discuss the findings of this small-case research.

4. Presentation and discussion of the findings

4.1 Responses to the first part of the questionnaire (demographic information; age groups; language levels)

55% of the participants in the course belonged to the age group between twenty to forty years of age, 27% to the age group between forty-one to fifty, and 16,7% between fifty-one to sixty. They lived and worked in different parts of the country. 44,5 of them taught in public schools (primary, junior, and senior high schools), 5,6% in private junior high schools, 33% in private institutes of foreign languages. 50% taught learners privately at home. 16,6% of the participants responded that private tuition at home was their main form of employment. As regards the language levels, the participants were teaching all levels with A1 and A2 being taught by the greatest majority. Table 1 presents the participants' responses diagrammatically.

Table 1: Language levels the participants taught



4.2 Responses to the second part of the questionnaire (applications for instruction, learners' collaboration, assignments, and assessment during the COVID quarantine period)

In this second part of the questionnaire, respondents indicated the applications they had used during the COVID lockdown and quarantine, which took place before the beginning of the course (AGG31). 88,9% (sixteen out of the eighteen teachers) had used videoconferencing and platforms of synchronous communication (Zoom, Cisco Webex, Skype, and Microsoft Teams) to deliver their lessons. 72,2 (thirteen teachers) had activated the chat to encourage learners to communicate with each other, send them messages with clarifications on tasks, or provide clarification on learners' queries. 61,1% (eleven teachers) had exploited the breakout rooms for their learners' collaboration. This last finding indicates that three out of the sixteen

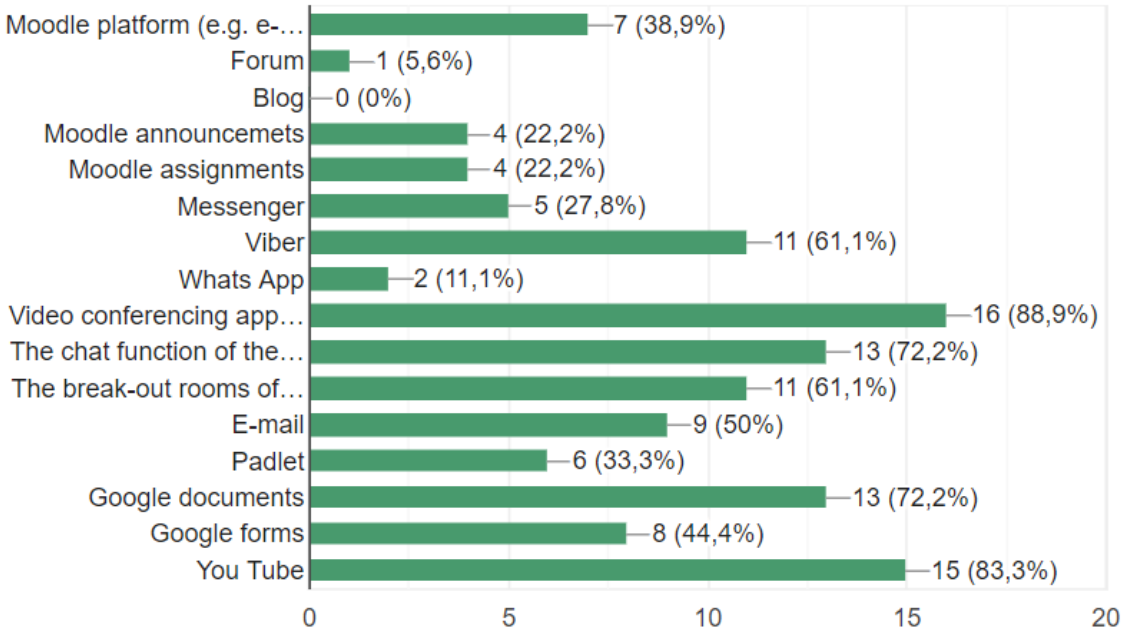
teachers who had used video conferencing had preferred frontal, one-direction instruction with the teacher addressing learners and learners providing answers to the teacher. The remaining thirteen out of the sixteen teachers, who had used videoconferencing, had either or both used the chat and/or the breakout rooms for learners' collaborative work on topics, exchange of views, ideas, and feedback.

38,9% (seven teachers) had used Moodle and the e-class as course management systems to provide learners with teaching/learning materials, guide them, upload announcements, and organize their lessons. One more teacher added that she had used the edy4schools for similar reasons. Only one teacher (5,6%) had employed the Forum of the course management system to trigger communication among the learners and offer opportunities for discussion whereas nobody had used the Blog to assign tasks and receive answers on topics from learners. Yet, 33,3 (six teachers) had exploited Padlet to assign tasks and let learners publish their work, comment on each other's posts, and exchange feedback.

As regards communication between the instructor and learners, all eighteen participants had used social networking applications, such as Facebook Messenger, Viber, or Whats app, to contact their learners individually or in groups; half of them (50%, nine teachers) combined emailing with social networking applications. One of the teachers who had not used email to contact learners explained that she found it time-consuming and for this reason, she had preferred instant messaging through applications such as Whats app or Viber.

In terms of applications that were used for language learning tasks addressed to learners, 83,3% (fifteen out of eighteen teachers) had used YouTube and video as stimuli to trigger learners' output or as a source of linguistic input to be processed by learners, especially the younger ones. 72,2% (thirteen teachers) had exploited Google documents for collaborative writing assignments and 44,4% (eight teachers) had used Google forms as a tool for creating quizzes and tests for assessing learners' performance. Table 2 presents the participants' responses diagrammatically.

Table 2: Applications teachers had used during the pandemic (before they attended the course AGG31)



In this second part of the questionnaire, teachers were invited to select the applications that had worked better for their learners as well as the ones their learners had found difficult to work with. In their comments but also through the interviews it was highlighted that Quizlet, Kahoot, Gimkit, Wordwall, and Bamboozle, applications where teachers create educational games, had worked well with young learners. Padlet was reported to have been creative and easy to use while Google forms and the e-class exercises were characterized as effective, useful, and practical applications for creating quizzes and tests because of the instant feedback learners receive.

One of the teachers drew attention to presentation applications, explaining that during the quarantine she needed to find ways for introducing new content to learners.

"*More effective tools were Skype and its chat because I could communicate with my students, share documents and share my screen. Also, I used Google Documents (e.g Powerpoint Presentations, Word Document) to present grammar and vocabulary or to design activities and send them to my students. Finally, classroom screen is another useful tool because I could present grammatical structures to my students with ease.*"

Other teachers brought up the issue of homework and the applications they had used for controlling and testing whether the expected learning outcomes of a lesson that had just been completed were reached. Padlet and Google documents were proposed for assigning and receiving homework, as they provide teachers with chances to respond and offer comments on learners' performance and how this can be improved. In addition, usefulness and practicality were attributed to course management systems and specifically the e-class because, on the one hand, learners could access the material they had to work on and, on the other, teachers could assign different homework tasks using Groups and feeding for differentiated instruction.

4.3 Responses to the third part of the questionnaire (Teaching online combining synchronous and asynchronous instruction in the future)

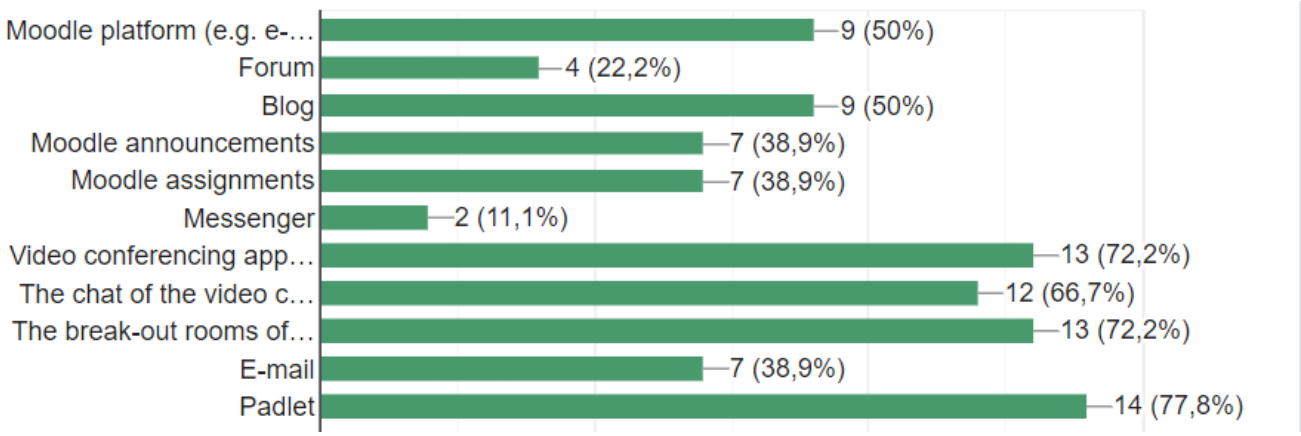
In the third part of the questionnaire teachers indicated which of the applications and methods they had been instructed to in AGG31 they would use for communication, learners' assessment, and collaboration in courses that instruction would be delivered online combining synchronous and asynchronous modes. Similarly to responses in the second part of the questionnaire, 88,9% (sixteen out of the eighteen teachers) selected videoconferencing and platforms of synchronous communication to deliver their lessons. This probably suggests that 11,1% (two out of the eighteen teachers) do not believe that videoconferencing can replace face-to-face instruction that takes place onsite, even though in the technology course they attended in the HOU (AGG31) face-to-face sessions took place online synchronously.

Comparing responses teachers provided in the second part of the questionnaire with those in the third, we can observe that whereas in the second part 61,1% (eleven teachers) had exploited the breakout rooms for their learners' collaboration during the quarantine, i.e., before attending the course, after the course was completed, 72,2% (thirteen teachers) asserted that they would use them for interaction, pair, and group work. This suggests that having experienced the potential of breakout rooms during the course, more teachers opted for their exploitation in synchronous online sessions.

Regarding course management systems, more teachers (50%, i.e., nine out of the eighteen teachers) affirmed that they would take advantage of Moodle and the e-class for organizing course content, and 38% (seven teachers) would use the announcements and the features of the assignment. It should be mentioned that only

22,2% (four teachers) had used these features in the quarantine. Another interesting observation we can make when comparing responses between the second and the third part of the questionnaire is that after attending the course AGG31, fewer teachers would use e-mailing and Facebook Messenger for contacting their learners. Instead, they would use announcements in course management systems, since, as some of them commented, this would save them time. The increased number of teachers who have been persuaded to combine videoconferencing with course management systems in contexts where e-learning is used as the only means of training may lead us to the conclusion that the more trainee teachers are exposed to online synchronous and asynchronous instruction through user-friendly applications the more likely they are to adopt this type of instruction and applications in their lessons. Table 3 presents teachers' selections.

Table 3: Applications teachers would use in classes that would be given fully online



In a similar vein, whereas only 33,3 (six teachers) had exploited Padlet during the quarantine, after attending the course AGG31, 77,8% (fourteen teachers) would use it to inspire learners to publish their work, comment on each other's posts, and exchange feedback. This may lead us to the conclusion that teacher training courses that adopt a socio-constructivist approach encourage teachers to assign more collaborative learning tasks to their learners and exploit tools that cater for immediate interaction. In addition, as it was reported in the interviews, what teachers appreciate in Padlet is that, except for receiving immediate feedback from the tutor and peers, learners realize the purpose of writing tasks, i.e., writing for a real audience, which renders writing activities on Padlet meaningful.

Concerning other applications for language learning that teachers were instructed to and experimented with while attending course Agg31, we can observe that 72,2% (thirteen out of eighteen teachers) selected digital storytelling, a form of language instruction that feeds for the integration of speaking with writing skills and project work. Furthermore, 66,7% (twelve out of eighteen teachers) propose online reading activities that engage learners in deep and critical thinking at higher levels. It is worth mentioning that 50% of the teachers (nine out of the eighteen teachers) proposed WebQuests, i.e., investigatory activities that allow deep processing of information. Let us quote some of the teachers' comments to highlight teachers' preference for learner-centered, social constructivist pedagogies in second/foreign language education:

"...b*ecause these selections render the teaching process immediate and constructive and Ss are moved from a teacher-centered approach to a learning-centered one, undertaking active roles and involvement and enhancing their speaking skills and critical thinking through project-based work.*"

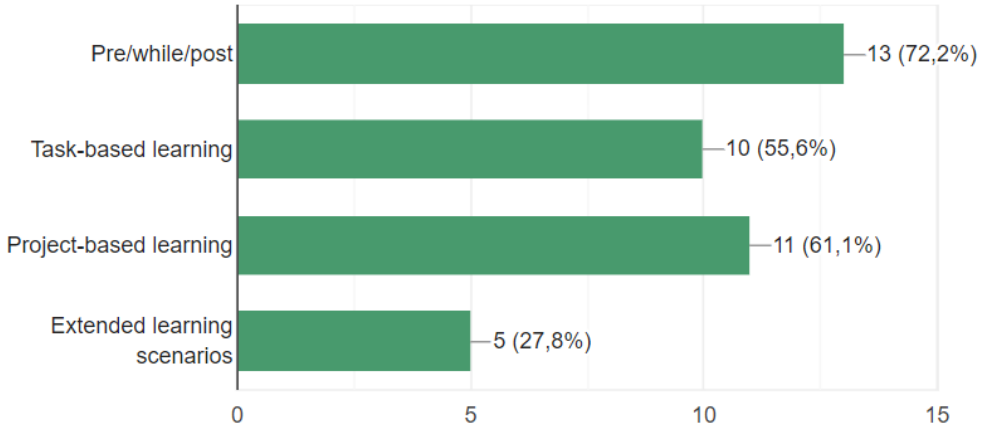
"*These tools promote learning and most of all engaging learners in the learning process in a variety of ways. Through this multimodality, the sts become more autonomous, learn how to learn and take up control upon their learning*."

"I've seen that Padlet, digital storytelling, eBooks, and Webquests maximize students' engagement, which has been one of my concerns, so I would use them to boost that."

"The online classroom facilitates students' access to web tools concurrently. Students can all play or complete activities and projects at the same time without waiting for their turn. This boosts their engagement. The use of videos, digital stories, and blogs may enhance students' interest and creativity. All the tools selected above may help render the lesson process focused on learners' needs and interests promoting more learner-centered teaching."

Another topic that was investigated in this small-scale research was the methodological frameworks teachers find more suitable for distance education and language learning after they had attended the specific course. In particular, they were asked to select among three teaching frameworks, i.e., the pre/while/post stages framework, the task-based learning, and the project-based learning framework. They were also offered the selection of more extended learning scenarios that allow teachers to design more integrative lessons that may combine applications and target the development of many language skills. Table 4 presents teachers' selections on different teaching/learning frameworks.

Table 4: Teaching/learning frameworks the participants found more suitable for classes delivered online from a distance.



Most teachers (72,2%, 13 out of eighteen) preferred the pre/while/post stages framework that has been used for many decades for teaching listening, speaking, reading, and writing skills in the target language. Teachers stated in their comments that their preference for the pre/while/post framework stems from the fact that they are familiar with this methodology. They added that linear teaching (pre/while/post) is more structured, and learners feel comfortable with it. Yet, as it is illustrated in Table 4, more than half of them emphasized that in the COVID-19 quarantine they found it useful and practical to organize their lessons on the premises of task-based and project-based learning, according to the demands and needs of each group and level. Some of the teachers who selected task and project-oriented frameworks justified their selection on the basis that their learners enjoy being presented with a variety of teaching methods and explained that having free rein, learners

are encouraged to express their ideas and opinions, which renders the lesson more motivating. One of them wrote:

"Through projects students apart from consumers become producers of the English language, collaborating effectively with peers, receiving and giving feedback."

Another teacher added:

"Setting up projects is my favorite way to teach as it combines searching for information, ample opportunities to practice all skills at the same time in the same project and provides a real-life purpose for the students who can use their creativity and imagination to achieve the desired outcome."

It can, therefore, be concluded that the teachers of the particular group believe that traditional frameworks should still be used but more modern frameworks and social-constructivism are highly likely to make the learning process of distant learning more effective as they promote the development of real-life skills. Task and project-based learning are considered to engage learners more and prompt them to collaborate and interact with each other focusing on the process of learning; they offer flexibility, creativity, and potential for improvisation. As for extended learning scenarios, that were selected only by 27,8% (five out of eighteen teachers), some interviewees explained that they believe that short lessons plans designed to last for one teaching session seem to work better with young learners, whose teachers may need to adapt planning occasionally. Consequently, it may be thought that teachers of young learners who attend course AGG31 might need more experience in designing effective and motivating extended learning scenarios with the aid of e-books, gaming, interactive worksheets, etc. In the subsection that follows we present teachers' concerns.

4.4 Teachers' concerns about the implementation of courses delivered fully online

In the second part of the questionnaire, taking into consideration their experience during the quarantine, teachers were asked if they have any concerns about the implementation of distant teaching. 72,2% (thirteen out of eighteen teachers) answered that they do have concerns. One of the main worries referred to learners' participation. While being interviewed, two teachers emphasized that during the quarantine their learners did not participate as much as they did in the onsite face-to-face lessons. One of them explained that some learners did not log in at all on the videoconferencing platform and some of them kept their cameras deactivated and did not participate energetically in tasks; instead, they preferred to remain silent. This led, as another teacher highlighted, to the lack of inter-personal connection between the teacher and the learners and among the learners themselves.

Another concern that was expressed by some teachers was learners' homework and assessment. It was reported by some teachers that during the online sessions they were not able to monitor the class as effectively and assess as accurately the levels of learners' understanding of new knowledge and engagement with the material. One of them mentioned:

"Many students did not participate at all on the Webex platform and those who participated rarely did homework because they knew that the teacher would not meet them in person and check. After the quarantine, I checked students' books and notebooks and found out that many pages were left blank even though they were reassuring me during the quarantine that they kept notes and did everything. I had to go back and cover some units again."

Teachers with classes of young learners reported that they faced difficulties keeping all learners engaged and monitoring what they were doing throughout the different stages of the lesson. They explained that there were instances when some children were playing video games instead of participating in the task at hand or pretended to have problems with the camera, the microphone, or the internet connection to avoid being involved in the learning process. Furthermore, some teachers referred to the lack of technical equipment from the part of some families who could not supply their children with what was necessary to attend online lessons whereas a considerable number discussed the issue of digital etiquette and asserted that not all learners were ready to respect other learners' feelings, avoid sarcasm or publishing other learners' comments, etc.

In the interviews the researcher held, almost all teachers discussed and explained their worries but stressed that at the time of the quarantine they had not been trained in exploiting videoconferencing and online asynchronous instruction neither had they completed the HOU course on educational technology. They admitted that in the quarantine they had adopted modes of instruction that were more suitable for face-to-face onsite learning. It was unanimously asserted by interviewees that integration and the effective exploitation of ICTs need to be carefully planned and learning units must be designed on the foundations of social constructivism, inquiry, task and project-based pedagogies, collaborative work, and problem-solving that keep learners engaged. It was also put forward that assessment is to be adapted to include alternative forms, such as self and peer assessment, e-portfolios, presentations, digital stories, etc.

5. Concluding remarks

Learning English is an essential component of all educational programs in Greece. It is taught in all sectors of education from kindergarten to senior high schools while at the same time centers of foreign languages offer lessons for all language levels. Courses, syllabi, textbooks, and TESOL exams follow the philosophy and assessment scales included in the CEFR and the CEFR companion volume. Educational technology is viewed as an integral component of undergraduate and post-graduate TESOL courses, and this happens because of two main reasons: On the one hand, technology facilitates instruction and communication between teachers and learners but also among learners themselves, who are meant to master the target language through communication. On the other hand, literacy is now seen as a construct that consists of a wide range of literacy subskills or multiliteracies, which are built on the foundations of 'traditional literacy'. These trends in additional language learning dictate the need for training programs that prepare teachers for the effective integration of new media in their teaching. The small-scale research project presented in this paper explored the extent to which practicing teachers may change their attitudes and educational philosophy from traditional and limited exploitation of ICTs to a more open, social constructivist thinking as a result of having attended a systematic course in educational technology at a MEd level.

The analysis of the participating teachers' answers to an online questionnaire and a semi-structured interview led to some first conclusions. It is seen that most teachers who have been trained through online, distant education courses are more willing to adopt this type of instruction. They seem to be taking advantage of course management systems to organize course content, send announcements, upload assignment instructions, let learners interact through forums, respond to blog tasks, and collaborate in wikis. When having been familiar with videoconferencing platforms, they appear to be exploiting breakout rooms for learners' interaction and collaboration and adopting task and project-based methodologies that involve learners of additional languages in problem-solving, inquiry-based learning, and higher-order thinking. In addition, they are likely to realize that alternative forms of assessment are crucial so that learners will use modern technological applications to reflect on their learning and set goals for further development. Furthermore, they

probably develop an awareness of the skills and multiliteracies 21st-century learners need and adjust syllabi and courses accordingly to accommodate these needs.

It should be mentioned, however, that the participating teachers in this small-scale research expressed their concerns about practical issues that may appear when courses are delivered fully online. One of their worries focused on learners' participation and engagement in the learning process because teachers cannot have physical interaction with their learners. Another issue that was highlighted was the need for teaching learners how to respect the ecology of social networking and online interaction. Besides following the rules of digital etiquette is a critical literacy 21st-century citizens are expected to acquire.

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Open Education and MOOCS, European MOOC Consortium

Current state of MOOC recognition in Europe

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Abstract

Massive Open Online Courses (MOOCs) are becoming very popular nowadays. This course modality implies that they are offered for a large number of participants, they are online and there is no fee for enrolment.
Regarding the learning structure, these courses are included in the non-formal learning group. The reason is that the knowledge is not rigid structured and the evaluation is not standardized. In consequence, getting global recognition is not as straightforward as in the case of formal learning.
In this paper, a review of the current recognition system of MOOCs in Europe is presented. In addition, some particular cases of some European countries are shown.

Keywords: MOOC, non-formal learning, recognition, Europe.

1. Introduction

Massive Open Online Courses, as their name describes, are interactive courses with open access via the web and aimed at an unlimited number of participants. There are no previous requirements or qualifications for enrolment neither some fee for a complete course experience (Jansen & Schuwer, 2015; Sandeen, 2013; Schuwer et al., 2015; Witthaus et al., 2016).

The meaning of each letter and its implications are shown in Table 1.

Table 1: Definition of MOOC (Jansen & Schuwer, 2015).

M	Massive	• Course designed for a considerable number of participants.
O	Open	• Accessible by everybody that has internet connexion. • Accessible at any time, place, and pace. • No previous requirements for admission. • Completion of the course free of fee.
O	Online	• Course modality is online.
C	Course	The course should include: • Educational material.

		• Interaction between the students and the academic stuff. • Activities, exams and feedback. • Some kind of recognition. • A study guide.

Attending to the pedagogical approach two type of MOOCs can be distinguished (Castillo S & Cifuentes R, 2016; Cedefop, 2015; Epelboin, 2013; Williams, Sassler, Frech, Addo, & Cooksey, 2013):

1. cMOOC: it is the first version of MOOC. The "c" comes from connectivism, as it is based on a connectivist strategy. It promotes creativity, autonomy, cooperation, and learning through social interaction in blogs, wikis, and other platforms. The participant plays at the same time the dual role o student and teacher. The assessment is peer review.
2. xMOOC: it is the most common nowadays.The x is for "eXtended" as it represents an extension to the online dimension of the classical courses. This format is based on the traditional structure of classes with video lectures, practical tasks, and support material. The evaluation is performed with online tests. There are also forums where the participants can interact with each other. This kind of MOOC focuses on knowledge transmission.

MOOCs are offered by experts from higher education institutions or companies and hosted on specific platforms for this purpose (Jansen & Schuwer, 2015; Sandeen, 2013; Schuwer et al., 2015; Witthaus et al., 2016). Usually, one institution, company, or organization, for-profit or not, is the owner and several partners offer their courses into it (Castillo S & Cifuentes R, 2016; Strobbe, Kelle, Medien, & Johannes, 2014; Witthaus et al., 2016).

There are many different platforms,being the most popular ones developed in the United States of America. For example, Coursera or EdX are platforms with a large community of learners and many universities from different parts of the world (including EU members) hosting their MOOCs (Castillo S & Cifuentes R, 2016; Strobbe et al., 2014; Witthaus et al., 2016).

Two companies in Spain, Santander Bank, and Telefonica launched Miriada X in 2013, a platform designed for Spanish speakers. It has become very famous across Central and South America and even in Europe. At present, there is a broad catalogue of courses in different languages, like Spanish, Portuguese, and English (Strobbe et al., 2014; Witthaus et al., 2016).

From an educational point of view, MOOCs are included in non-formal learning, a concept that is between formal and informal learning, meaning that the knowledge is acquired through planning activities but not explicitly structured according to learning objectives, learning time, or learning support (Witthaus et al., 2016).

This kind of learning faces the difficulty of getting global recognition as it does not follow a rigid structure and there is no standard procedure to evaluate the acquired skills.

This paper aims to show the current status of the recognition of Massive Open Online Courses in Europe. Each time more and more students enroll in this course modality and demand some kind of accreditation. As they are considered non-formal learning, the way for recognition by higher education institutions and companies is not straightforward.

2. The purposes of MOOCs

Apart from learning, the objectives of studying or launching a MOOC can be broad. While in United States MOOCs are seen as a possible change in the economic paradigm promoting employability, in Europe the

expectations are more aligned with educational goals. The main purposes of this type of courses inside the European Union are (Epelboin, 2013, 2014; Pomerol, Epelboi, & Thoury, 2015):

1. Support for educational transformation: MOOCs offer the possibility of applying flipped learning. This new pedagogical approach allows the students to be the main actors in their learning process, as they learn by themselves new concepts following the teacher's instructions and discuss them with other learners or teachers. This novel way of learning encourages the students to be more active and autonomous.
2. Support for students entering the university: usually, when students enrol in a university degree, they do not know what to expect. Specialized MOOCs can bring them an idea of what they have chosen before official enrolment.
3. Attract international students at bachelor or master level: for universities or institutions, having a MOOC increases the visibility and expands the recruitment pool.
4. Lifelong learning: MOOCs enable continuing education without any cost or fixed schedule.

Regarding the target audience, MOOCs are opened to any kind of people, independent of their age or background, from children to the elderly. There are neither geographical barriers nor social ones. Despite this fact, the participants are mainly undergraduates or people that have recently finished their degree or master and desire to find a job. This issue suggests that MOOCs have become an aid for professional development and a complement of traditional education careers (Epelboin, 2014; Pomerol et al., 2015; Williams et al., 2013).

3. Recognition

Recognition is defined as "*a formal acknowledgement by a competent authority of the value of a foreign educational qualification with a view to access to educational and/or employment activities*" (Council of Europe, 2001).

This concept is very well understood in formal learning, where quality assurance mechanisms exist, learning is rigid structured and there is an official status to confirm the acquired skills and competences (Witthaus et al., 2016).

In Europe, there is a tool to validate and recognize formal learning called the European Credit Transfer and Accumulation System (ECTS). It was created during the Bologna Process in order to regulate higher education in all the participant countries. This tool is aimed at higher education systems and is in charge of structuring the learning, guarantee its quality, transparency, recognition, and uniformity across all the involved countries (Driha, 2017; Witthaus et al., 2016).

In the case of non-formal learning or informal learning, the process of recognition is more challenging due to the definition of non-formal or informal learning itself. The European organisms have been trying to arrange the validation to foster employability and mobility. Despite this fact, there is only a set of guidelines to validate this kind of learning (Cedefop, 2015; Witthaus et al., 2016).

The European Council proposed four steps to recognize the learning achievements through non-formal or informal learning (Cedefop, 2015):

1. Identification.
2. Documentation.
3. Assessment.
4. Certification.

As it was mentioned, by the moment, these are only recommendations for achieving the recognition of the acquired skills and competences through this type of learning. However, the validation is voluntary. The

participants should receive all the information about the recognition process and, then, they decide until what phase they want to reach (Cedefop, 2015).

MOOCs are considered as part of non-formal learning. In consequence, they should fulfill the four phases to obtain formal validation.

Despite of having a general procedure, there is still no agreement on how to measure the knowledge, how the assessment should be performed, and what are the requirements for the certification (Cedefop, 2015; Driha, 2017; Witthaus et al., 2016). Furthermore, the vast topics and abilities addressed by them hinder the task of defining an international accreditation framework.. On the one hand, the main obstacles to MOOC recognition are (Driha, 2017; Witthaus et al., 2016):

- They were not conceived to provide any formal recognition. This is the main reason why they do not fit in the traditional accreditation process.
- Not all MOOCs have static content. The cMOOC type evolves with learners.

On the other hand, some issues need to be taken into account to guaranteed the success of the formal validation (Driha, 2017; Pomerol et al., 2015; Witthaus et al., 2016):

- As they are online, it cannot verify the person's identity enrolled in the course.
- .
- The inexistence of fraud in tests cannot be assured. For example, another person or a robot could perform the test.

Regarding these issues, some platforms are trying to solve them. For instance, they require a copy of the identity card of the student to provide any recognition, using cameras during the final test or even perform the test in person in a recognized institution (Driha, 2017; Pomerol et al., 2015; Witthaus et al., 2016).

In the meantime, some alternatives for the recognition of the learning achievements of MOOCs have been proposed. They are not standardized and each MOOC can have one, a combination of some or all of them. They are (Driha, 2017; Witthaus et al., 2016):

- Digital badges.
- Statement of accomplishment.
- Certificate.

A digital badge is an online record of achievement inside the MOOC. It contains information about when it was achieved and why. There are different badges depending on the type of achievement. For example, composite badges can be obtained after completing a task, activity-based badges when an activity is successfully passed or grade-based badges to express the qualifications (Witthaus et al., 2016).

Usually, participants receive for free a statement of accomplishment for the completion of the MOOC. This statement is an indication that the participant performed all the activities and it includes its name, the signature of the teacher, and some data about the course. However, in any case, this statement is not an official accreditation. In general, this document is for free (Driha, 2017; Witthaus et al., 2016).

Some MOOCs give the possibility of earning a certificate. This certificate has more validity than the statement of accomplishment and tries to provide some quality and transparency to the course. Nonetheless, it does not represent an official recognition by the European Union and all the member states. It includes the name and the identity of the participant, information about the university and the platform, and a certificate code to guarantee the authenticity of the document. In most of the MOOC platforms, there is a fee for this certificate and it varies from $49 to $100 (Aguaded & Medina-Salguero, 2016; Driha, 2017; Witthaus et al., 2016).

Some universities have taken the initiative of offering ECTS credits for the completion of a MOOC. However, this practice has not been extended and remains in particular cases. The European Union has in mind this possibility as a formal recognition, although there is still a long way to go (Driha, 2017; Witthaus et al., 2016).

4. Particular cases

In this section, the particular cases of 4 of the most populated countries in the European Union are addressed: Germany, France, Italy, and Spain.

4.1. Germany

Regarding ECTS recognition, two relevant cases are presented. On the one hand, the particular case of the University of Lübeck and iversity and, on the other hand, the general MOOC situation on the German platform iversity..

In 2013, the Technical University of Applied Sciences Lübeck (https://www.th-luebeck.de) announced that they offered the first MOOC with ECTS recognition entitled "Fundamentals of Marketing" (Wittke, 2014). The MOOC was offered in the German platform iversity, where students must pass an on-site exam to get the credits (Witthaus et al., 2016). This recognition ended in 2016. Since then, in the "Frequently Asked Questions" of the iversity web page, they make special relevance in two points:

- Iversity does not guarantee that the student's university will accept the ECTS credits that students have earned.
- The student is responsible to ensure that the host university accepts the ECTS recognition for the MOOC completed at iversity.

Summarizing, iversity clearly indicates that ECTS recognition has been removed from their platform, and they do not expect to add them again in the future.

Nowadays, getting an iversity certificate is easy: one needs to sign up on the platform and complete the profile with the real name.

Regarding the general cases, MOOCs offered in the top five universities in Germany are very limited, providing them in the already mentioned platforms, like Coursera and Edx (Peters & Seruga, 2016). In this sense, although no ECTS credits are directly provided for the completion of the courses, it is suggested that, whether the student wants such recognition, he/she must ask his/her institution whether it recognizes the completion of a MOOC with ECTS.

4.2. France

The Ministry of National Education launched a national platform for MOOCs through its Digital University, namely *France Université Numérique* (FUN) (https://www.fun-mooc.fr). MOOCs offered in this platform are mainly in the French language (at 2020/07/19, there were 468 in French, 31 in English, and 1 in Spanish). To achieve a set of quality standards, the platform encourages institutions and teachers to follow the provided guidelines of the platform (Witthaus et al., 2016). A point to highlight is that the guidelines suggest that credentials should be given for attendance and contribution, but not for meeting learning objectives. In this sense, badges are given after completing the course, but not for achieving a certain level of knowledge. In the "Terms and conditions" on the webpage, there is information about the three types of free certificates that a student can obtain. These completion certificates are given at the end of the course, but no ECTS are provided.

In addition, French universities such as Pierre et Marie Curieor Sorbonne have their MOOCs also available at other non-French speaking online platforms. In these platforms, courses are free and the evaluation and follow-up criteria are very heterogeneous : they depend on the evaluation criteria set by the course director. For example, there are MOOCs with a simple follow-up certification if the student follows it, others have a quiz or exam. However, they do not give ECTS credits after completing the MOOC.

4.3. Italy

The situation of the MOOC courses in Italy is highly heterogeneous. On the one hand, there are universities, such as the Politecnico of Milan (https://www.pok.polimi.it/) or the University Federico II of Naples (https://www.federica.eu) which has their webpage for MOOC courses. In addition, it is also common for them to have their MOOCs listed on other platforms, such as the case of the University Federico II of Naples and EdX. MOOC courses presented in these platforms are mainly in Italian, and they do not offer ECTS credits.

However, under the European Union-funded project "HOME – Higher education Online: MOOCs the European way" (EADTU, n.d.) a new MOOC platform was launched, created by a consortium of more than 10 Italian public universities: EduOpen (Limone, 2016; Rui, 2016). It offers courses mainly in Italian but also English. There are 4 levels of recognition:

- Attendance certificate and open badge: By completing the activities, each participant receive an attendance certificate and an open badge (distributed by Bestr, www.bestr.it)
- A verified certificate: After completing the course, passing an exam on the university that has made the course or on a NICE del CINECA (http://nice.cineca.it/) centre.
- ECTS credits: in EduOpen, the student has the opportunity to get ECTS credits after completing a course. For that, he/she must be registered for that course in the university that provides the course and complete an exam.
- ECM credits: ECM is the acronym of *Continuing Medical Education,* the tool to guarantee continuous training of health professionals, provided by the National Health Service. The assignment of credits is subject to participation in the entire online training program and verification of learning by passing the final test.

4.4. Spain

Similar to Italy, the recognition of ECTS due to the realization of MOOCS is heterogeneous in Spain.

Some Universities offer ECTS recognition for certain MOOC they offer online, while other not. Furthermore, not all MOOC courses from the same university have the recognition of ECTS credits, and the student must be careful when selecting the course and choose one that offers them..

For example, The National University for Distance Education (UNED) (https://www.uned.es/universidad/inicio.html) through its online platform (https://iedra.uned.es/) has three levels of recognition available for all its courses:

- Badges: Informal acknowledgment. Free of charge and there is not any academic recognition for it.
- Credentials: It is granted to those who ask for specific recognition. It is a UNED own recognition and does not have ETCS recognition. Its fee varies depending on the course. The information that appears in this recognition is the full name of the student. Title, dates, and number of hours of the course and date of the expedition.
- Certificates: It is the highest official accreditation of the UNED, having ECTS recognition, from 0.5 to 5 ECTS. Its fee varies depending on the course. The information that appears in this recognition is the full name of the student and its ID number. Furthermore, the title, dates, numbers of hours, date of

the expedition, and a brief description of the course are also given. The ECTS recognition is for the UNED University. For other universities, its recognition depends on the host university.

Another university, the Autonomous University of Madrid (www.uam.es) has joined March 2014th the Edx consortium to open their MOOCs to all publics. It offers MOOCs with the recognition of 1 or 2 ETCS. However, students must check them carefully before selecting a specific one, because not all of them are available for ETCS. In addition, the correspondent fee must be paid.

Other Spanish universities also offer ECTS recognition for the realization of MOOCs. However, the recognition is subject to:

- The ECTS recognition is only valid for the university that has made the course. There is not a national system for recognizing MOOCs independently of the university.
- If a student wants to obtain an ECTS recognition for a MOOC done from another university, he/she must ask for it at its current university. Thus, this recognition can be accepted or denied, depending on the university.

- A fee must be paid to the university that has made the course for the recognition of the ECTS credit.

5. Conclusions

As their own name indicates, MOOCs are open access courses for everybody through the internet. They are part of non-formal learning, as they do not follow the classical structure either a standard evaluation process.

These days this course modality has become very popular worldwide. For this reason, global recognition of MOOCs is getting attention. However, MOOC recognition is neither simple nor straightforward, because they were not conceived for that purpose and they do not follow the traditional learning structure.

In the last years, different ways of recognition have been proposed. For example, digital badges, certificates, or even ECTS. Nevertheless, there is no general agreement about the process. The European Union has proposed the first voluntary guidelines for recognition based on four steps, but there is still a long way to go. At the moment, each educational institution follows its own criteria.

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Changing the Pedagogical Landscape: New Competences for Teachers

A national project enhances language teachers' professional competence

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Abstract
The purpose of this study was to investigate which activities during a nation-wide project contribute to the project participants' professional development. The context was the Finnish Ministry of Education and Culture funded KiVAKO-project (2018-2021) which aimed to build a nationwide online language course offering on a shared platform. 86 language teachers of 26 universities and universities of applied sciences were involved in the project, and as its result 55 language courses were created covering the following languages: Chinese, Estonian, Finnish Sign Language, French, German, Italian, Japanese, Korean, Portuguese, Russian, and Spanish on the levels CEFR A1-C1.

During the project, project seminars were organised once an academic term. In addition, the language teachers worked in teams co-creating the course, and in the pilot phase, co-teaching the online courses. The language teams organised their work independently. Further, online self- and peer-evaluation workshops were organised for the piloted courses at the end of the academic terms. The workshops were facilitated by the project's digital pedagogical mentors.

The research data were gathered by an online questionnaire which was sent to the participants after the project. The questionnaire included Likert-scale statements and open-ended questions mapping participants' perceptions on the project activities. The qualitative data were analysed via content analysis method and the quantitative data with basic statistical methods.

The results indicate that working in the language teams as well as the peer and self-evaluation workshops were meaningful for the participants and had a positive impact on their professional development.

Keywords: professional development, language teaching, online teaching

1. Introduction

The higher education reform is continuous and supported by many national development projects during the last years. There have been several projects related to digitalisation of education increasing accessibility and flexibility and creating more digital courses and services. With increasing demands on teachers' competences, finding new ways to support teachers' continuous professional development is essential.

According to previous research collegial collaboration expands teachers' field of action and develops their skills (e.g., Granegat & Gray, 2007; Kunnari, 2018). Teachers' competences develop in research and development projects; hence, projects serve as a method to enhance teachers' professional development. Higher education

teachers establish individually and in teams new ways of working and at the same time, they learn from each other's activities, investments and collaboration (Kullaslahti, 2011; Korkealehto, 2019).

In their study Töytäri et al. (2016), found four different ways how teachers at Finnish universities of applied sciences describe their learning. Individual learning reflects the traditional concept of learning, knowledge acquisition from written or audiovisual material, and reflecting alone. The second, collegial learning, describes learning as an interactive collaboration with another person. In the third, team learning, collective problems are solved together by sharing skills and knowledge. The fourth, innovative partnership learning, is characterised as co-creation and collaborative innovation in research, development or workplace relations.

The context of this research is the national KiVAKO-project, which was funded by the Finnish Ministry of Education and Culture. The aim of the project was to widen the Finnish higher education language studies by creating a nation-wide online course offering available for all Finnish tertiary students, regardless of their home institutions. The duration of the project was three and half years and the participants were 86 language teachers of 26 universities and universities of applied sciences.

There were 12 language groups: Chinese, Estonian, Finnish Sign Language, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish and eTandem. Each language group have a coordinator. The language teachers worked in teams co-creating, and in the pilot phase, co-teaching the online courses. The teams organised their work independently. As a result, there are 55 language courses (184 credits) on the levels CEFR A1-C1.

During the project, project seminars were organised once an academic term, 7 in total. In addition, online self- and peer-evaluation workshops were organised for the piloted courses at the end of the academic terms, four times in total. In the online workshops the teachers were divided into break-out rooms in each of which two pilot courses were presented, evaluated and discussed. The course creators presented their courses according to a template which included different quality aspects to evaluate the course. The courses were available for the peers two weeks beforehand for them to monitor the course from the student's perspective. The workshops were facilitated by the project's digital pedagogical mentors. Piloted courses were presented parallel in a dialogical manner step-by-step according to the quality criteria for online implementations (Varonen & Tyrväinen, 2018) after which the peers gave feedback and development suggestions.

The aim of this study is to gain a deeper understanding of language teachers' perspectives of participating in project work and to investigate which project activities contribute to participants' professional development. This study addresses the following research question: What activities during a project do language teachers perceive enhancing and hindering their professional development?

2. Methods

The research data were gathered by an online questionnaire which was sent to all participants of the KiVAKO-project after the last online self- and peer-evaluation workshop. The questionnaire included Likert-scale statements and open-ended questions mapping participants' perceptions on the project activities. The qualitative data were analysed via content analysis method with the help of Atlas.ti software and the quantitative data with basic statistical methods.

The respondents were 27 language teachers involved in the KiVAKO project, 5 of them worked for universities, and 22 for universities of applied sciences. Prior to the KiVAKO-project, 7 of them had no previous experience on online teaching, 7 had 1-3 years of experience, 6 teachers 4-7 years and 7 teachers had been teaching over

8 years online (Table 1). Similarly, overall teaching experience varied: 1-3 years (1 teacher), 4-7 (1 teacher), 11-15 years (3 teachers) and 22 teachers had over 15 years teaching experience.

Table 1: Teachers' teaching and online teaching experience before KiVAKO project

Experience in years	Teaching experience	Online teaching experience
no experience	0	26 % (n=7)
1–3 years	3,5 % (n=1)	26 % (n=7)
4–7 years	3,5 % (n=1)	22 % (n=6)
8–10 years	0	7 % (n=2)
over 10 years	92 % (n=25)	19 % (n=5)
Total	100 % (n=27)	100 % (n=27)

The language groups were of different sizes, the largest group (German) had 24 teachers and the smallest ones such as Korean, Chinese, Japanese only 1-3 teachers. Thus, there were different numbers and different sizes of teams within the language groups.

3. Results

3.1 **Collaborative planning and co-creation of the pilot courses**

The results indicate that most of the teachers experienced collaborative planning and co-creation of the pilot courses as very positive, rewarding, fruitful, very helpful, functional and congenial (Table 2). However, approximately one-third of the teachers experienced challenges, mainly at the beginning of the project. Only some teachers evaluated the teamwork not functioning very well at all.

Table 2: Teachers' experiences of the collaborative planning and co-creation of the pilot courses (n=23)

Categories	Description	Frequency
Inspiring experience	rewarding, fruitful, very helpful & functional, inclusive, best, great or positive experience	13
Inspiring & challenging experience	congenial and challenging at the same time, challenges mainly at the beginning	8
Challenging experience	working in a team did not work, did not get adequately involved & initial startup difficulties	2

Learning experience, participants' different experiences and backgrounds and co-creation had the most significant impact on inspiring and exciting experiences in collaboration (Table 3). Some teachers described that the collaboration was perceived fruitful when the team was experienced to collaborate productively and dialogical, encouraging and supporting each other. Additionally, getting to know new colleagues was perceived attractive and learning about other ways of working from another universities. This opportunity was highly appreciated, especially if they were the only language representative in the university.

Table 3: Inspiring and interesting experiences in the collaboration

Categories	**Description**	**Frequency** (50)
Learning experience	learning something new (digital pedagogy, tools, project work), sharing knowledge (novices-experts, native - no-native), peer learning, insights and ideas about the implementations and experiences of others.	15
Different experiences & backgrounds	different experiences and backgrounds: university – university of applied sciences, age, teaching or online experience, different languages, networks	12
Co-creation	co-creation and co-construction from pedagogical manuscript to the implementation, new concepts and experiments	12
Great team	smooth, productive collaboration and encouragement, interesting conversations, helping another	6
Colleagues from different universities	colleagues from different universities and universities of applied sciences, different ways of working in universities, have a colleague who teaches the same language	5

Time management was the most mentioned challenge (Table 4). The participants experienced that it was not easy to arrange a suitable time for all team members nor to find sufficient time for their teamwork. Insufficient coordination means shows at the beginning of the project as lack of common pedagogical understanding and principles for building online courses, as well as guidance for the new participants. There were also challenges in the resourcing and workload, competences, person-dependent ways of working and engagement in the project.

Table 4: Challenging experiences in the collaboration

Categories	**Description**	**Frequency** (36)
Time management	agreeing schedules with others, finding a common time and staying on schedule and arranging for one's own work.	14
(Insufficient) Coordination	insufficient coordination at level of language groups and/or the project	8
Resourcing and workload	different resourcing within universities and understanding this in joint work as well as workload in relation to resourcing	5
(Inadequate) Competence	own or colleague's technical, pedagogical or linguistic competence	4
Person-dependent ways of working	different pedagogical views or ways of teaching, even critical commenting	3
Insufficient engagement	different engagement, making the promised contribution and on time	2

3.2 **Self- and peer-evaluation online workshops**

The online self- and peer evaluation workshops were considered having an impact on language teachers' professional development. All respondents experienced workshops useful for their skill development (Figure 1). The workshops provided a forum for sharing ideas, comparing pedagogical solutions and digital tools as

well gaining inspirations from each other's course in a positive and supportive atmosphere. The organisation of the workshops was regarded successful – the dialogical approach among peers sparked fruitful discussions and provided other perspectives enabling further development of the courses. In addition, the participants valued the opportunity to introduce their own course which forced them to evaluate their own course in reflection with the quality criteria – self-evaluation phase had added value in improving the pilot for future implementations.

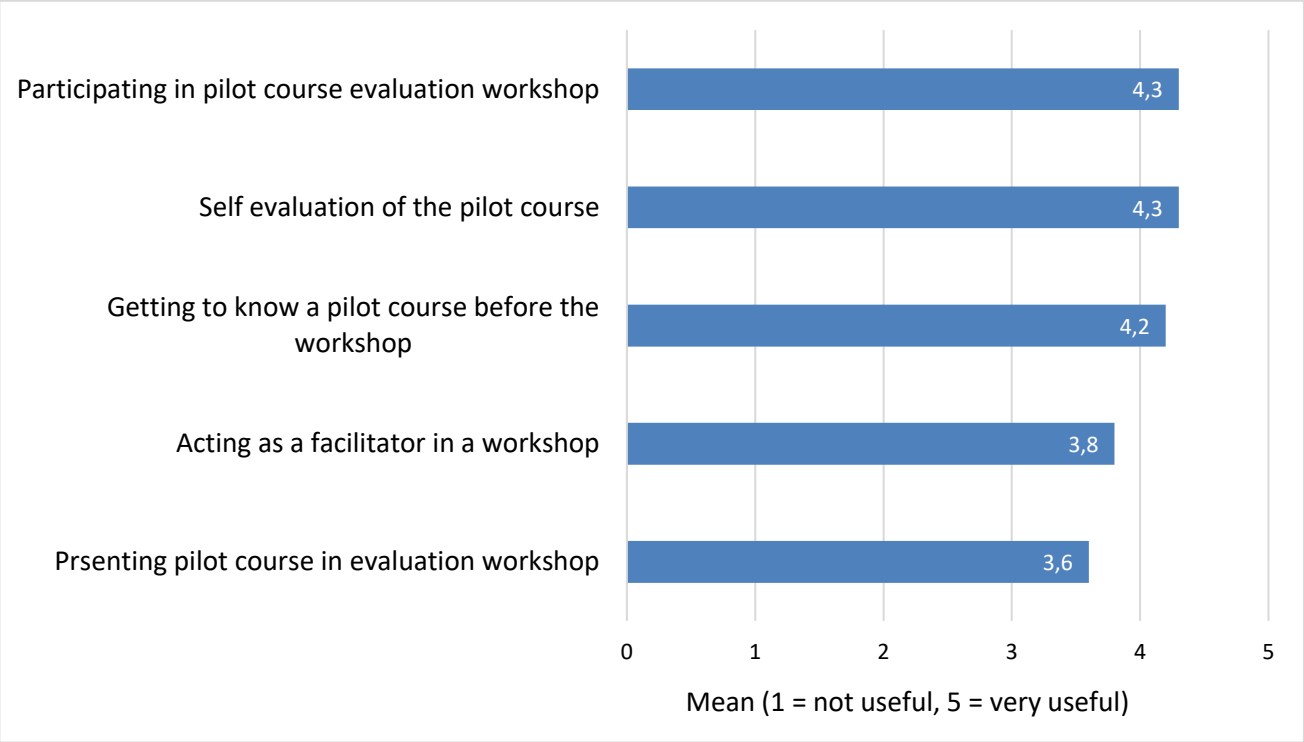

Figure 1: Usefulness of self- and peer evaluation workshop activities for skill development

Limited time resources in the actual workshops or in exploring the evaluated courses beforehand were considered to cause the most challenges in the workshops. Also, the evaluation process was regarded less beneficial if the peer evaluators did not master the course's target language at all. Some teachers regarded the criteria points too numerous for such a short workshop, and the eAMK quality criteria was considered not totally suitable for language courses. Further, in the workshops, the teachers valued the opportunity to learn from each other as they saw how other courses were designed. Similarly, the discussions both in language teams and workshops were appreciated.

4. Discussion and Conclusions

This study focused on language teachers' experiences when acting in a national development project. The aim of the study was to gain a deeper understanding of language teachers' perspectives of participating in project work and to investigate which project activities contribute to participants' professional development. The results indicate that working in a national project with colleagues enhanced language teachers' professional development. The collaboration was perceived as a learning experience which comprised aspects such as experimenting new teaching methods together, co-creating, learning from each other, sharing expertise and knowledge. The participants' heterogenous background and experiences widened the participants' perspectives and provided them with new ideas. Learning occurred both in the language teams and in the pilot course evaluation workshops.

Furthermore, the results imply that during the KiVAKO-project teachers' professional competence grew a lot. Particularly their knowledge of digital pedagogy, online teaching, learning design and various digital tools as well as technological know-how increased. In addition, the participants regarded that their confidence of creating online courses improved, which was an advantage when all teaching transferred online during the Covid-19 pandemic. Some respondents even state that participating in the project has been pivotal in terms of their professional growth; they valued the information they gained from state-of the art digital pedagogy and use of Moodle platform and learning analytics. The opportunity to compare their own courses with other language teachers' course was considered to contribute to the professional development.

The results of this study are in line with the work of Töytäri et al. (2016), since the same learning modes are described by our participants. Individual learning in terms of self-reflection promoted teachers' learning. Enjoyable collegial learning with teachers of the same language provided forums to discuss ideas and problems of the particular language. Further, especially the language teams and online evaluation workshops enhanced team learning, as the teachers were able solve problems collectively by sharing skills and knowledge. Finally, innovative partnership is experienced as the teachers co-created and innovated collaboratively new courses, piloted, tested and developed them together further.

To sum, teachers' learning is both an individual and collaborative process. Teachers' development can be seen as either work-related learning or work-based learning which is built on previous experiences (Kullaslahti, 2011). Also, in KiVAKO project, learning occurred through continuous applying and adjusting, solving problems individually or in collaboration with peers or experts. Research and development projects widen teachers' action sphere which promotes learning from each other's products, actions, collaboration, and co-creation.

In the changing working environment teachers are required continuously to develop their own skills and competences. They need ability to adapt and adjust, innovate new solutions and abandon unfunctional ones. In accordance with the DigCompEdu framework (Redecker, 2017) language teachers need to develop educator-specific digital competences in collaboration with teachers who are at various competence levels. This creates a basis for professional engagement and continuous professional development.

Research and development projects offer an opportunity for teachers to learn, and they contribute to professional development. In higher education it means that the institution's management and action culture in terms of time management, resourcing and workload needs to allow teachers to participate in projects. From the project organization point, it means that it needs to plan its functions in a manner that timetable allows time and space for discussion, co-creation, mutual support, and innovations.

After the project, a new cooperation network KiVANET was established, in which the participating organizations will continue offering and developing language courses in cooperation. The aim is that the cooperation started during the project, will yield a national network supporting teachers' digital pedagogical expertise and peer support to create high-quality online learning implementations/courses.

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Academic development program in blended format

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Abstract

This paper presents the training strategies implemented by the Science and Engineering Faculty of Sorbonne University and more precisely by CAPSULE, its pedagogical innovation centre. In order to counter the needs of our teachers, encourage and facilitate their involvement, our academic development program team opted for a major transformation of its educational offer by choosing to introduce a blended format training for the academic staff.

Sorbonne attaches a great importance to academic development and highlights teachers' investment in the teaching procedure. In parallel, our university is engaged in the transformation and the promotion of blended format teachings.

Our team, following the testing of several formulas such as conferences and face-to-face workshops, decided to explore a different approach for our pedagogical training offer. We undertook considerable work designing and transforming our trainings on pedagogy into a blended format implemented on the Moodle platform. We wanted to overcome the various obstacles and enlarge our target audience by allowing them to take advantage of blended learning benefits, for instance flexibility, reorganising time and space constraints, meeting learners' heterogeneity by offering quality and personalized trainings.

By embracing the various combinations of classroom presence and online study and by setting up diversified learning activities, we aimed to explore new experiences for teachers within a student's posture. Collaborative works in an inter and trans-disciplinary framework encourage critical regard and self-evaluation of its teaching practices. Due to the Covid crisis, our project has met a great impulsion engaging new participants in our pedagogical trainings offering constructive feedback to learners and facilitators.

Keywords: academic development, blended teaching and learning, Sorbonne University, interdisciplinary and transdisciplinary exchanges, collaboration

1. Introduction

Sorbonne University (SU) is a recent multidisciplinary university resulting from the merge between Paris Sorbonne and the University Pierre and Marie Curie (UPMC) in January 2018. UPMC was already attaching great importance to academic development as part of its overall policy and strategy. Each disciplinary

department of the university was encouraged to support teachers with their teaching methods through peer instruction and feedback.

Within our university, the education field is changing and its stakeholders have to adapt. Thus, an academic development program raises and desires to promote the university's educational frame and values through several trainings over pedagogy. This change is also supported since 2017 by novelty legislation, nationally implemented, that delegates the academic development of the new teachers at the university. At Sorbonne University, the teacher-researcher's investment in teaching is highlighted by its inclusion at a "unique investment bonus" combining research and teaching. Within this environment, the educational and pedagogical frame has been enhanced by encouraging thoughtful engagement in teaching.

At the same time, Sorbonne University has been selected as the laureate for a ten-year project for the transformation of its Bachelor's degree courses - NLSU (Nouvelle Licence à Sorbonne Université, New Bachelor degrees at Sorbonne University). Thus, our institution, following the increasing popularity of blended learning (OBL), particularly important in recent years (Philipsen, Brent; Tondeur, Jo; Pareja Roblin, Natalie; Vanslambrouck, Silke; Zhu, Chang (2019)) launched this major and ambitious project aiming at in depth transformation and review of classical teaching by proposing several opportunities to teach and learn through courses built in a blended format.

At the Sciences and Engineering faculty, we created a large academic development program for supporting and strengthening the pedagogical skills of our teaching staff as well as accompanying this large institutional project.

Our team, after testing several formulas for its pedagogical offer, decided to explore a different approach. We redesigned several of our trainings on pedagogy into a blended format implemented on our institutional platform.

Our aims have been multiple. First, overcoming various obstacles and enlarge our target audience as blended format trainings allows us to offer flexibility to all participants and at the same time meet the learners' heterogeneity by offering quality and personalized trainings. Secondly, we wanted to propose concrete examples of blended training courses that could serve as study cases for all participants. Lastly, we considered the benefits of placing teaching staff in a "student" position during a blended or online training. The importance of these elements was reinforced during our training sessions.

Several universities worldwide propose online or blended modules for academic development purposes and a significant literature treats the subject. Nevertheless, we have the feeling that further investigations needs to be undertaken over the benefits participants can obtain by experiencing the students' posture within a learning system whose format differs from the classical ones they have already experienced.

This article aims to present a first feedback of our experience and a preliminary analysis based on qualitative data collected during interviews.

2. The academic development program at the Faculty of Sciences and Engineering

The academic development program of our faculty is directly linked to the educational framework of our university. Previously as part of UPMC, our team of experts in the pedagogical field proposed a rich training offer including several workshops about the main inputs around pedagogy in teaching and learning. These trainings were very well received by the public of our university. However, day-to-day reality such as the workload of our teaching staff and the lack of proper recognition of the investment made in teaching for a

career advancement, slowed down the dissemination and active participation of new teachers besides a certain faithful and enthusiastic group always present.

In order to overcome the various obstacles and enlarge our target audience, we undertook since 2019 a considerable work of rethinking the contents of our trainings but mainly transforming their format by redesigning our face-to-face modules in a blended format.

Before continuing, it would be opportune to define the blended format as we see it and try to implement. These systems are, by use, supported by techno-pedagogical environments which support the teaching-learning process through a mediatisation and a complex mediation of pedagogical contents and resources note Charlier, Deschryver and Peraya (2006, p.481). We see the blended format as a highly context-dependent term, a combination of various degrees of face-to-face and distance teaching and learning that can be ensured with or without the use of digital technology. A blended module or program is also the combination of various technologies and teaching methodologies that requires teamwork and collaboration between the different actors for enhancing a student-centred approach in teaching and learning. One of the main aims is to privilege a real cognitive "presence" during the learning activities, whether they are proposed synchronously or asynchronously, with the teachers' supervision, run autonomously, take place independently or in groups.

Our strategy behind this transformation is multi-faceted and linked to the global educational strategy of our faculty as well as the advantages blended teaching and learning proposes.

By choosing a pedagogical approach that puts the learner in the first line, we wanted to offer trainings around the thematic of blended learning and teaching in a blended format in it-self. That way, participants will learn while experimenting with this learning modality. "Making the transition from a face-to-face to an OBL (online blended learning) environment can have a great impact on teachers' self-perception and on their perception of their profession" notes (Philipsen and all) and continues by insisting on the importance "for teachers to have the opportunity to reflect on the roles that they ascribe to themselves and their students in this new environment".

In addition to our strategic goals of disseminating hybridisation, we also saw a major advantage a blended format could offer in terms of time and space. As A. Jézégou (2008) notes, blended formats can free oneself from spatio-temporal constraints and offer great flexibility and accessibility to participants/learners in learning situations. Participants had the possibility to pursue the trainings at their own pace and rhythm and confirmed the fact participant/learner thus engages in training when and from where he/she wishes, and works at his/her own pace (Huang and al., 2012) which enables him/her to better reconcile these times of professional, training or private commitment. Thus, our decision to develop blended trainings was also motivated by these criteria, allowing the teaching staff to follow trainings around pedagogy at their own time and place. Teachers' workload is significant, and following a training could be seen as a real time-consuming activity despite the subject's interest or professional pertinence. Could this format be an answer to a certain reluctance to attend face-to-face trainings due to lack of time or scheduling conflicts? A global transformation of certain of our core trainings in a blended format was therefore undertaken in order to facilitate their dissemination and use.

Do teachers fully understand the students' posture and needs if during the academic development trainings they keep their initial role? From our point of view, discussing the needs of students while following a blended course as a case study is definitely very beneficial, yet experiencing the student's position, the advantages, disadvantages or difficulties is, from our point of view, much more constructive and meaningful. Thus via our approach, we wish to deepen the comprehension of our teachers by helping them evolve their teaching

paradigm and competences for avoiding the risk identified by Anna Comas-Quinn "It has shown that training, particularly in the workplace and particularly when it is about technology, often focuses on knowledge and skills and neglects understanding and professional transformation. In other words, it is often about learning to teach online rather than learning to become an online teacher."

Our decision to blend our trainings meets also a second aim: to offer our teachers concrete examples of blended modules that can be used as tangible models of a real living space where they can progress as a group thanks to the interactions between facilitators and peers.

During the last one-year and a half, throughout the Covid sanitary crisis we all experienced, our blended trainings had to be transformed and the face-to-face sessions had to be rethought for an online and distant work. Our main goal was to propose practical workshops in a collaborative format enhancing discussion and feedbacks from pears and facilitators. Today's technology offered several possibilities allowing the digital implementation of the pedagogical activities we wanted. However, this did not affect the type of activities that had been planned to take place offline under the usual circumstances.

In this paper, we will concentrate on feedbacks of proposing blended format academic development modules to our teachers and the way they have been experienced. We will also discuss the following questions:

- Does an academic development program offered in a blended format appear practical for the teaching staff of our university?
- Can the blended format of our pedagogical offer be helpful for the academic development of our teaching staff?
- How did challenging teachers to experience a blended learning "as a student" influenced their perception regarding teaching and learning through a blended format course?

2.1 A blended academic development offer

Today the transformation of our academic development offer is still in progress. For us a long and ongoing research project that started with the analysis of the needs and the existing procedures, the development of new trainings or the transformation and enrichment of few current ones. We wanted to maintain a quality teaching that takes into account the heterogeneity of our target audience and at the same time, offer flexibility and independence to our teachers.

Participants were invited to work autonomously or in groups and participate at the synchronous meetings. During these synchronous moments, we stressed the importance of discussion and exchange between peers as well as practical exercises by putting forward collaborative, concrete and applied pedagogical activities directly linked to their teaching context.

We designed a series of courses on our faculty's Moodle platform (see figure 1). We willingly integrated pedagogical activities allowing exploring Moodle's capabilities, integrated or other external tools, such as Panopto, Wooclap, Padlets, Draft, Miro, etc. We likewise focused on the field of pedagogical practices and developed short modules about "Blended teaching and learning", "How to design or re-design a module in a blended format", "The constructive alignment" mentioning a few of them. Several sessions are proposed during the academic year. The time length of each session varies regarding the training length and difficulty. We also adjust and schedule with the participants the synchronous sessions for better answering to their needs and professional obligations.

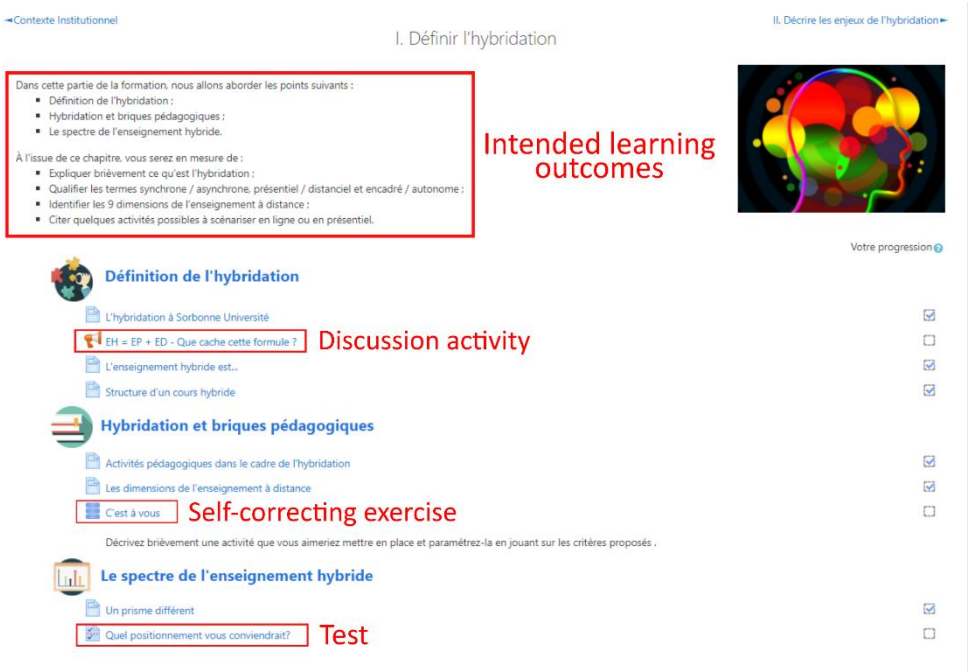

Figure 1: A chapter of our blended training about “blended teaching and learning” designed on our Moodle platform. You can see at the beginning the intended learning outcomes of the chapter and the different activities we propose

During the training, participants have to work independently to acquire a few theoretical points, verify their understandings (see figure 2), produce work, participate at practical collaborative workshops, interrogate their own teacher’s posture, etc.

We underline here the importance we give to the practical workshops we had initially designed as face-to-face collaborative activities where participants work and apply the theoretical elements viewed and discussed previously during the training. It is important that teaching staff gain new experience by working on a study case they choose themselves and that is in direct link with their disciplinary courses. Due to the Covid crisis, all our face-to-face practical workshops were proposed online and by using collaborative tools.

Thanks to the blended format all learners, supervised by the facilitators, can follow the trainings at their own pace and rhythm carrying out the activities of the course with only schedule constraint the participation in the synchronous workshops and practical trainings.

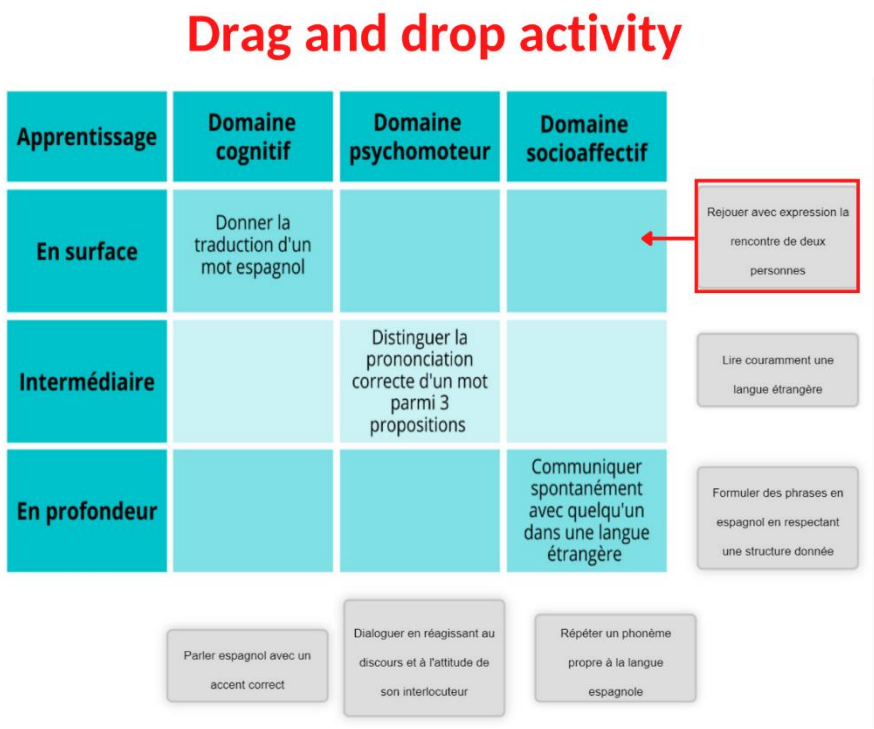

Figure 2: Online practice with an inch of gamification for verifying the good comprehension of pedagogical notions. Blended training “How to write the intended learning outcomes of your course” designed on Moodle. It is a H5P interactive drug and drop activity

3. Evaluation of the new format

3.1 Research methodology

Participants

To recruit participants, we emailed the professors who had been included in at least one of our trainings carried out in a blended format and who had given their permission to be contacted after the trainings. Unfortunately, few professors were available as the interview period coincided with the beginning of the academic year, the busiest period for them. In total, six participants were recruited and all of them agreed to participate in both quantitative and qualitative parts of the study. One of them is male and five are female, all francophone. All participants agreed to participate in the study on a voluntary basis (i.e., no remuneration).

Here is a list of our interviewees, associated to a code name used during the presentation of our results as well as the titles of the trainings they followed completely or partially.

Interviewee	CODE	Complete training	Partial training
Participant 1	P1	- How to design or re-design a module in a blended format	- Moodle Basics

Participant 2	P2	- How to design or re-design a module in a blended format	
Participant 3	P3	- How to design or re-design a module in a blended format	- Intended learning outcomes
Participant 4	P4		- The constructive alignment - Intended learning outcomes
Participant 5	P5	- How to design or re-design a module in a blended format	- Moodle Basics
Participant 6	P6	- Intended learning outcomes	- The constructive alignment - How to design or re-design a module in a blended format

Methods

We collected both quantitative and qualitative data. The former was collected via a questionnaire we designed to gather professors' feedback on their appreciation of the trainings, on the skills they acquired during the trainings and their propositions for future improvements. It contained 23 questions, 20 being mandatory, and it took in average 15 minutes to fill it in.

To collect qualitative data, we conducted semi-structured interviews with the professors who filled in the questionnaire. The aim of the interviews was to get more information about professors' experiences during the trainings and about their teaching before and after the training. By running an interview after the questionnaire, we were able to keep interviews under 1 hour where the major focus was on detailed experiences as we already had a general overview of professors' feelings towards the trainings. As the interviews were conducted at the beginning of an academic year, we wanted to make sure they would not entail a hugely time-consuming burden on professors at this period. This also allowed us to spot any discrepancies between the reported feelings in the questionnaire and the experiences talked about during the interview. Both questionnaire and interviews were conducted in French. A bilingual person translated the answers to English, and the translation was verified by two independent reviewers.

Procedure

If adherents were interested in participating in our study, they were redirected to an online questionnaire consent form and once it was signed, redirected to an online questionnaire. They were then re-contacted for an interview, but they were under no obligation to agree in participating. In the online interview consent form, they were given an option to agree to participate in the interview, but not to have their voice recorded nor notes being taken. The interviews took place online on the Zoom platform. Only one adherent participated in each interview, and they were interrogated by two researchers. One of the researchers was leading the interview and was responsible for asking most of the questions, while another was responsible for taking notes (if permission was given) and asking follow-up questions if necessary. The meeting audio was recorded if the adherents were agreed. Adherents had a right not to answer any question and to stop the interview at any time.

Data analysis

All the data was stored on a password-protected computer of the principal investigator, and only they had access to it. Once we transcribed and translated the audio recordings, we deleted them. We assigned a code to each participant's name, and once we matched each set of questionnaire answers to the audio transcription, we deleted the file that contained the link between participants' names and their codes. We performed a thematic analysis following Braun and Clarke's (2006) methodology because we aim at discovering individual experiences rather than universal truth as each participant has received and gives different classes as part of their teaching activity. We did not define a theoretical framework for our data analysis, taking an inductive approach to derive themes purely from data. We perform a constructionist analysis: from concrete examples given by participants, we derived our analysis.

3.2 Our results

The results presented here derive from the qualitative interviews conducted with teachers that followed, fully or partially, one or more trainings.

"*Since [year], I have been working with the same pedagogical practice and I never have time to question my practice, to know if I was good and what I could improve.*" (P5)

In the first part, their feedback was about the content quality of our trainings, their blended format and if the teachers perceived it as useful. In the second part, it was about their experience and feeling having followed these blended modules "as students".

Blended format effectiveness

In this paragraph, we will treat three main points, the participants' appreciation on the advantages trainings' format offered them, their overall appreciation of the didactic content before mentioning a general appreciation about the courses' animation from the facilitators. Most participants gave favourable comments and appreciated the blended format of our trainings: "*I like this format [blended format] very much, especially as I am thinking about and working on the revision of the content of a fully distance learning course, and it allows me to test and put into practice what I am thinking about in my own discipline*" notes P6 while he/she is questioned about the blended format of the trainings.

One of the first points that emerged was the flexibility through blended format offer in terms of time and space. "*Compared to other classical training courses where there is a waste of time where you try to understand what is expected of you, [the interviewee] really liked the proposed blended format*", notes P6. Participants were free to organize their studying schedule and to decide how much time to invest in the trainings depending on their work obligations as noted by P2 "*To have the freedom to get prepared for asynchronous activities outside the constraints of working hours*". Moreover, participants could follow and participate in the trainings without having the obligation to come on the campus for the face-to-face meetings. As P2 said: "*I work easily in the evening and at night and the training is convenient for me because I can work in the evening, and the blended training allows me not to take time in the day and to be able to organize myself as I want*."

This fact was also very much appreciated as notes P6 "*I really appreciated the training courses that had to be prepared before the course (readings, explanations + application exercises). These preparations allow you to have a more precise idea of what you are going to be talking about and then to keep a record*." P5 equally said that he/she "*was obliged to work on his/her own*", reading "*the course in the evening at home in the quiet because during the day there was no time*". These comments comfort the advantage blended formats offer,

which is the possibility for participants to engage autonomously or in groups besides their participation at the synchronous meetings and activities.

From a practical point of view, all interviewees also applauded the blended format of the courses because of the possibilities they had to come back and consult the pedagogical resources and contents of the trainings at any time even after the end of the training session. "*It was comfortable*" noted P5 "*to have resources in one place, with logic, as a learner*", "*be able to connect [on Moodle] any time, to enjoy reading like a new book that you like*".

During our interviews, P1 declares: "*Concrete practice is more useful than the virtual, but the virtual can be supportive*" as "*the synchronous moments are important to focus and make things human*". This comment corroborates our design and implementation as one of our major goals was to put into practice the theoretical elements that had been seen and discussed beforehand during the training. The added value of a passage through reality shows that the teacher's disciplinary practice is essential. It is for this reason that despite the difficulties that the geographical distance imposed because of by external factors, we emphasise the importance of practical activities and workshops. These activities and workshops allow the participants to experience realistic situations and have in their hands tangible and immediately exploitable results. The hands-on study cases were very much welcomed as participants felt ready to start a substantial work of redesigning their courses, and that although it "*is a work in progress and it feels like starting from scratch*", P6 is "*convinced and want[s] to put it into practice*".

P3, working on an ongoing project of redesigning a course, validated our belief about the fact that working on a concrete teaching project has an influence while following the trainings can have. He/she explains that the "*2nd and the 3rd synchronous moments came at key moments in terms of reflection: during the 2nd, we had already acquired a background on blended learning and teaching which fed the reflection, especially through the activities. The third [synchronous moment], the practical workshop - crucial - we were able to formalise the projects and use our knowledge to put them into practice*". From our point of view having a tangible project as an individual teacher or as a group has a real impact on the motivation and engagement of the participants because they directly apply the discussed elements on their teachings.

During our discussions with the interviewees about the use of digital tools, P2 underlined getting better at "*using ICT tools*" or "*Integrate Wooclap activities (voting tools) in some of their teachings*" as notes P4. As the situation forced us to redesign our practical workshops in a digital format, we used several collaborative online tools, such as Draft, Padlet, Framapads, Wooclap, etc. It is moreover interesting to say that this extensive use of online tools not only allowed participants to discover new tools but also made few of them confident enough for disseminating their practical use to their colleagues: P2 "*is teaching to some of his/her colleagues now*". For P3 "*the process was set in motion*" and mentioned "*having the input of an experienced trainer and discovering other tools and also experimenting with them as was the case during the trainings*" and "*discovering discipline specific things*" was very beneficial.

Nevertheless, we need to point out that even if the practical collaborative activities conducted online with collaborative tools were appreciated and made sense for the participants, it was expressly mentioned that a face-to-face format would be more effective. P3 mentioned: "*I think it is a pity that the synchronous time was remote. In face-to-face, the interactions would have been better, handling the cards (the draft tool is a good alternative), moving, more lively, easier to grasp at the very beginning*."

All the participants' comments comforted the original pedagogical design of our trainings with the main practical activities conducted synchronously on campus where interactions and collaborative work can be easier and more dynamic. An amelioration suggestion would be the inclusion of more pedagogical videos "*organise interviews, video clips about specific things, what they [teachers] did and how it helped*" (P5). Already conscious about this element we have undertaken actions for enriching our trainings with short pedagogical clips.

After discussing with the participants over their global appreciation of the trainings' animation, is was stipulated that *"[Their] trainers, in addition to being competent, were very friendly, attentive and very sensitive and responsive to the problems specific to each discipline*" (P6) who continues by saying "*Sometimes if there are blockages, the feedback from others and from the trainers [...], makes it easier*". If someone had "*difficulties in exchanges, the stress of being in the thick of things, with other colleagues, we expose ourselves, but once we are at ease, the barrier of a colleague's gaze disappears. Saying that you don't understand something is possible as soon as you feel at ease*". This trusting atmosphere became easier thanks to "*the small room format (online), we can exchange differently, get to know each other, break the ice and give another rhythm*". "*The atmosphere was therefore completely relaxed and left room for the expression of each and every one of us. Real exchanges were able to take place*". During the training sessions, we worked on facilitating the communication and creating a living space, a secure and favourable environment where participants feel safe to discuss and exchange freely ideas, difficulties and questions. This choice was backed by the interviewees who clearly appreciated this way of doing.

Teachers' meta-reflection on their practices

Another observation that emerged from this research was the global influence the blended learning format modules had in terms of teaching position and attitude.

Our teachers experienced academic development trainings in blended format as "students", consequently in a posture of trainee and not trainer, shifting from the position of expert holder of knowledge to that of learners engaged in their learning while working on fundamental questions about pedagogy such as active and student-centred learning, blended learning. They interrogate themselves and question their practices through a pedagogical prism and they seek to facilitate student's comprehension and learning. P5 explains that "Having *taken this course as a student it allowed me to see the advantages and disadvantages and above all to see what was possible*" and P3 insisted on the fact that "*It makes you rethink the way you teach and what's important and how to bring things in, so that at the end the skills are developed*".

Through the comments of all interviewees, we observed an evolution, an enrichment of their teaching approaches and way of being. P4 "*will propose activities like presenting in "3 minutes" (an outcome or an idea) to everyone because there were disparities for more objectivity in the evaluation*". P6 notes that before these academic development trainings he/she "*had vague ideas about the new pedagogies*" and "*the training allowed [P6] to clarify things*". Having proposed flipped learning modalities during our trainings, P6 said having "*appreciate the flipped classroom format […] it brings a lot*" because he/she "*tried it as a student and I liked it*". It was considered as a "*relevant*" format and it will be "*implemented in my classes*" for students to work autonomously before the class on a few theoretical points and be able to work more in depth during the face-to-face moments in class.

It was also the moment to question the effort and investment needed for redesigning a course, for reviewing few practices, change different elements. It is certainly a time consuming process, an iterative work. P6 "*Change takes a lot of time, modesty, humility, and encouragement to know that I am on the right path*", and

pedagogy experts' feedback "*motivates and reassures*". "*You have to go modestly step by step, test, experiment, there may be failures, but that's learning*." Nevertheless, P5 underlines the need for more active top-down encouragement, "*there must be incentives from the faculty, from the dean, for teachers to invest in these training sessions*" and that "*The training must be rewarded by a bonus in terms of service hours*".

Even if all of them were already extremely conscious and familiar with a quality student-centred teaching, they let appear during our interviews a more important meta-reflection process on their teaching methods, "*accept to question ourselves*" as explains P6. The importance of the presence of the teacher was clearly mentioned, not as "sage on the stage" but as a guide and expert throughout the pedagogical activities that encourage peer discussions and exchanges. P4 states: "*It was the content of the training that helped me to change my posture - to become much more aware of a student-centred approach*". P1 underlines that for him/her it is very important "*to explain [to the students] how they can proceed step by step*" after "*putting themselves [the teachers] in their place, as learners, in the acquisition*" process. Our interviewee insists on the importance of students to "put their own spin on the subject in the learning process".

P3 points out the fact that: "*Following a blended course for a blended project has allowed us to implement a lot of things in our own project*" while P5 considers: "*Repeat the model that was shown: there were very useful things*". This validates our strategy and main goal; demonstrate to our participants well-designed blended courses. It is also the reason why we worked in depth the pedagogical design of our trainings by proposing different ways to engage the participants and facilitate learning. For P3 "*present the learning objectives - one of the levers of motivation*" for the students. "*If they don't have what is expected of them, they won't engage*".

A point P5 underlined was the importance of considering the learning time invested by students while studying: "*Especially on the personal work time of the student and its implementation and consideration*".

Additionally, interviewees stressed the importance of accompanying students, especially first year students to the use of digital tools such as Moodle. They emphasised this element because they lived the "Moodle experience" not as teachers with creator's rights, but as "students" that had to follow instructions, a tree structure of a module they have not conceived, a course schedule, assessments to upload, etc. P4 stressed out "*this helped to place myself in a student's position, to explain differently*" while teaching. At the same time P2 says that he/she realized "*it is easier when we are face-to-face with the tools*", but online, if someone has a problem, it can be "*frustrating*" and "*students can be in the same situation*". P3 mentions that it is important to "*guide the students*". "*It's not intuitive, how to progress in the platform, how to use it, the features that can help them and that they don't know*". And the interviewee concludes by saying "*I'm going to make sure that Moodle is better organised - it is important - do something to make it easier [for the students] with a theoretical part tutorial part, a practical part - so that they can navigate more easily*". Having a "*more user friendly*" experience with "*interactive contents*". These statements confirm that the academic development modules lead the teachers to a reflection on their teaching practices.

4. Discussion

To better satisfy our teaching staff needs in a direct link within our university's strategy, the academic development team proposed trainings about pedagogy in a blended and online format. After several sessions, we asked volunteer participants to give us their feedback on previously defined points. We were interested to get their perception on the effectiveness of the trainings, their format, their pedagogical conception, as well as their comments on their "student" role while following these trainings. Their feedback allows us to confirm several of our strategic decisions.

The flexibility-blended trainings offer is very much appreciated and seems to be an adequate answer to a real time and place constraint teaching teams can face. This was confirmed by all participants that declared ready to follow trainings within the same blended format. This modality was equally very much appreciated from participants located at remote sites located miles from Paris, such as Sorbonne University's marine stations. The teaching staff participating located elsewhere was keen to follow blended or entirely online trainings as it was seen as a concrete answer to the real geographical distance. This point was mentioned several times during the training by all participants, who participated or not in this research.

The pedagogical activities we have chosen to put forward were equally validated as participants welcomed the theoretical parts they needed to explore individually. They also appreciated the discussion activities anchored in the reality of their profession that foster a critical exchange as well as the practical and applicative workshops in groups. The pedagogical structure we designed seems to answer the needs our target audience expressed not only from a competencies point of view but also from an intercultural and interpersonal one. Indeed, they identified a collective enrichment experienced within the training's secure and supportive living space.

Teaching staff feedback allows us to bring also few answers to one of our principal questions: how a change in teachers' posture during the trainings, experiencing academic development blended courses as a "student", could influence their way of thinking and acting.

Participants seem to question themselves not only about their assumptions as teachers, but also by comforting their metacognitive process, already in progress, about their way of teaching. They confirm a clearer student-oriented approach for their teachings; students are placed in the centre of concerns. The means and incentives that will facilitate their engagement, participation and motivation are also given more consideration. This preoccupation goes even further on by cross-examining more consciously the way students can experience their blended and online teachings. The development of a set of pedagogical activities appropriate to the teaching objectives is now reinforced and examined. This is also done for the very use of the digital resources made available on the university pedagogical platform. As a result, it appears to them equally important to consider the design and the digital structure of their courses on our Moodle platform.

5. Conclusions

Academic development is part of the intrinsic strategy of our institution and we are engaged to ensure the creation of a rich pedagogical offer tailored to the needs of our target audience, the teaching staff of our university. In this context, we developed a number of blended training courses in order to facilitate their dissemination and to provide effective support to the attending teachers. We conducted a series of training sessions in a blended format and we interviewed some participants over their experience. The initial qualitative feedback we received confirms our hypothesis and decisions.

This is ongoing project aims to study the impact of putting teachers in an authentic 'student' learner situation in a blended pedagogy system. Our teachers provide quality teaching and are already well aware of student heterogeneity and the difficulties that students may encounter. They have been students; they have already experienced "classical" university teaching during their years of study. However, very few have had the opportunity to experience learning as students through a blended device. It is this learning that we wish to support and promote with our project and the first feedback seems very encouraging.

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Building digital teaching and learning capabilities in Higher Education in Ireland with the DigitalEd.ie knowledge platform

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Abstract
In 2019, GMIT along with higher education partners IT Sligo and LYIT in Ireland, were awarded a HEA Innovation and Transformation award to build digital capabilities in the Connacht-Ulster Alliance (CUA). The project is called iNOTE and it provides opportunities to transform the higher education experience in the CUA institutes (2019-2022). GMIT Teaching and Learning Office, is leading the development of DigitalEd.ie Knowledge Platform and digital teaching and learning development initiatives (i.e. Work Package 2 of the iNOTE project). DigitalEd.ie, is a digital teaching and learning knowledge platform, that provides access to professional development pathways and a suite of digital resources, to build digital capabilities and pedagogic expertise, so that educators can design, deliver and support flexible and online learning programmes effectively.

This paper will discuss: the development journey of DigitalEd.ie; building a digital education community; designing digital learning pathways; creating a digital resources directory; insights and impact of building digital teaching and learning capabilities during the pandemic; and the creation of a suite of digital education services and resources, that is transforming the higher education learning experience.

The DigitalEd.ie project is linked to an action research study in GMIT, that is informing a best practice model for developing digital teaching and learning capabilities in higher education.

Keywords: Digital Education, Digital Teaching & Learning, Online Teaching, COVID online learning, Student Engagement, Student Success.

1. Introduction

Galway-Mayo Institute of Technology (GMIT) includes five campuses in the West of Ireland with 8,000+ students including 40 nationalities. GMIT is a member of the Connacht-Ulster Alliance (CUA) with IT Sligo and LYIT, and is working towards achieving Technological University (TU) status. The GMIT Strategic Plan 2019-2023 outlines thirteen goals that place the student at the centre of everything we do. Digitalisation and the use of technology are a key strategic priority for GMIT. In 2019, GMIT along with higher education partners IT Sligo and LYIT in Ireland were awarded a HEA Innovation and Transformation award to build digital capabilities in the Connacht-Ulster Alliance (CUA). The project is called iNOTE and it provides opportunities to transform the higher education experience in the CUA institutes (2019-2022).

In March 2020, the physical closure of all five campuses in GMIT, forced everyone online in a hurry and transitioned our learning, teaching and assessment activities to a new platform. The COVID 19 emergency has

fundamentally changed the way we all live and work, and this is having an enormous impact on the teaching and learning experience in GMIT and the wider CUA. The transition has been challenging, but it has also presented a number of opportunities for developing digital capabilities among the teaching community and alternative strategies for student engagement.

Transitioning to online teaching and learning in GMIT was made possible due to a number of factors including: the advances in education technology globally in recent years, and the seamless integration of Microsoft Office 365 suite and Moodle; Connacht Ulster Alliance (CUA) engagement with a HEA funded digital education development project called iNOTE, and the development of https://DigitalEd.ie; the Teaching and Learning Office's digital teaching and learning online support resources and rapid response digital education workshops; a suite of flexible online learning development courses; the flexibility and dedication of the teaching community engaging with digital professional development; and the creation of the BOLT steering group for GMIT during the emergency in 2020.

A range of initiatives established, that are building digital teaching and learning capabilities in GMIT include: *the development of a digital champion team representing each academic department; Ask Me Anything (AMA) clinics; digital teaching and learning small group workshops; a digital education webinar series; alternative assessment strategies workshops; show and tell insight sessions on digital technologies; recruitment of graduate student mentors; online PASS leadership sessions to support the first year experience; the digital education development pathway at DigitalEd.ie for academic staff; digital professional practice alternatives; and investment in a remote teaching technology toolkit, for all staff working remotely.*

To begin, this paper will explore a literature review on teaching and learning challenges during the pandemic, followed by the development story of DigitalEd.ie knowledge platform, feedback from stakeholder engagement and focus groups with the Digital Champion community, the impact of the DigitalEd.ie initiatives to date, and finally the paper will conclude with a discussion on lessons learnt.

2. Literature Review

Reflecting on the response by higher education institutes to the challenges involved in the sudden relocation of teaching, learning and assessment away from the traditional campus environment, is presented in a variety of reports, and this has guided the transition and digital transformation journey in GMIT over the last 12 months. Key national reports include: the QQI (2020); the National Forum for the Enhancement of Teaching and Learning (2020); the USI (2020); GMIT's annual report to the HEA on the iNOTE project (2020 and 2021); a special GMIT Student Opinion Campaign undertaken in partnership with the GMIT Student Union (2020 and 2021); and an open discussion forum with academic and professional services staff in GMIT, to identify the challenges encountered with remote teaching.

Overall, the reports collectively refer to the enormity of what was achieved through dedication, collaboration and innovation in moving teaching, learning and assessment online. In September 2020, an analysis of the COVID higher education reports, reflecting on the learning, teaching and assessment experience, was prepared by GMIT Teaching and Learning Office and the findings were categorised under eleven themes including: *working and studying at home; teaching and learning; assessment; policies and procedures; college experience; digital skills and academic professional development; communications; health and wellbeing; fees and finance;*

resources, supports and access; return to campus. The findings were considered by Academic Council and the Governing Body and have helped pave the way for the next phase of GMIT's digital transformation journey, including managing the COVID-19 remote learning experience.

Within a very short period (i.e. one-two years) many researchers in higher education institutes both nationally and internationally, have also shared their teaching practice experiences during the pandemic. The main objective of higher education practitioners was to allow their students to achieve the learning outcomes and continue their education during the COVID-19 global pandemic. The pandemic was an opportunity to pave the introduction of digital teaching/technology enhanced learning (TEL) and to introduce new assessment strategies and alternative assessment opportunities. The DigitalEd.ie project was a particularly valuable resource for higher education lecturers across the CUA (Connacht Ulster Alliance), in supporting this.

A relevant and recent study, that reinforces the importance and impact of digital education resources and training, was published by UCD (2021) titled, 'Online Learning Experiences of Irish University Students during the COVID-19 Pandemic'. Responding to pandemic and remote teaching challenges that arose in March 2020, this study investigated 132 full-time Business postgraduate students' online learning experience in an Irish University. Findings from both quantitative and qualitative data provide insights into what worked, what did not and why. This study found, that most students still prefer in-class learning, despite some very positive online learning experiences (Yang, 2021). They felt that the social aspect and the learning benefits from face-to-face interaction with instructors and peers are not fully replicable in the online learning environment. The findings suggest that the foundation for an effective online learning experience is engagement. Synchronous delivery happens in real time, this means students and teachers can interact in a live, virtual place and engage in real-time online communication and discussions regardless of location (Snart, 2010 ; Clark and Mayer, 2016). Students spoke highly of the classes, that have interactive activities, which allow them to engage with their instructors and classmates. These activities were commonly associated with live virtual sessions. Where such activities occurred on a regular basis, students felt more connected to their peers and teachers (Yang, 2021).

The findings from the UCD report, correlate well with the GMIT OpinionX student experience study conducted in June 2020 and February 2021. The OpinionX engagement campaign was organised to understand the experiences of GMIT students during remote learning and assessment. The survey engaged 1,253 students accounting for nearly 18% of the total student body. The OpinionX approach, is an 'open-survey/discussion platform' which means that participants not only submit written responses to a question, but they also vote on each other's submissions. This data was used to surface the opinions that best represent the views of the wider population. The study in 2020 and 2021 explored the GMIT student learning experience during the COVID remote learning period and found that lecturers overall have done a good job during the pandemic using interactive and engaging online learning methods such as quizzes, the digital whiteboard and online polls. Students also shared their views on continuous assessments and online exams, noting their preference for online exams rather than the in-person exam hall experience. Overall, 52% agreed with a statement that they have adapted well to online learning and a further 62% agreed with a statement that they were struggling with online learning. This represents the student experience in higher education nationally (USI, 2020), where students shared their struggles with adapting to online learning, while also recognising some of the benefits gained from digital education experiences.

The UCD study also reported on the technology students most enjoy including a digital interactive whiteboard, Microsoft Teams and OneNote (Yang, 2021). The literature reports on three main factors influencing teachers' use of technology including: the experience of other teachers; availability of technology in the classroom; and availability of in-school training (Yang, 2021). There are also challenges to consider, where some teachers lack confidence in using this technology and this can influence their use. The National Literacy Trust (Picton, 2019),

found most teachers supported using technology but cited lack of training as the major barrier. Almost a quarter (23.3%) had no training in using technology in literacy teaching. Research shows that teachers must know how and when to use technology which, when used appropriately, is an important tool in the classroom (Hollebrands, 2020). Teachers' levels of technological skills and capacity to adapt both the quality and quantity of curriculum, are essential for student success.

Furthermore, a relevant study titled 'The Impact of COVID-19 and Emergency Remote Teaching', outlines the impact of these changes to the practitioner's teaching in the discipline of computer science in the UK. This research is based on quantitative and qualitative results from a large-scale survey of the educational workforce (i.e. approx 2,197 respondents). This study was conducted in the months after institutional closures in March 2020 and the shift to online delivery. This research reports on how educators teaching computer science in various UK-settings (214) show significantly more positive attitudes towards the move to online learning, teaching and assessment, than those working in other disciplines. These perceptions were consistent across other schools, colleges and higher education institutions. Practitioners noted the opportunites of these changes for their respective sector, especially a renewed focus on the importance of digital skills (Crick, Knight, Watermeyer, & Goodall, 2020).

3. DigitalEd.ie Knowledge Platform Development Story

In June 2019, the Teaching and Learning Office (TLO) team in GMIT commenced a digital capabilities audit across eight campus sites in the CUA institutes, and this was followed by an audit of digital education tools available through various online platforms. In parallel to this activity, GMIT established a partnership with the State University of New York (SUNY) (a network of 60+ campuses in New York state delivering online programmes), to learn about their online teaching and learning strategies and approaches in building a student support services model for remote and blended learners. Following the review of SUNY teaching and learning resources for the online teaching community, GMIT TLO began to work on the development of a Digital Education knowledge platform, a Digital Champions programme, an online self-directed course on 'how to teach online' and the creation of a level 9, Certificate in Digital Teaching and Learning, aimed at higher education staff.

By October 2019, the national INDEX digital staff and student experience survey launched in Ireland, and this examined the digital experience of staff and students in GMIT and higher education institutes throughout Ireland. This audit and evaluation of digital capabilities in GMIT and CUA partner sites, provided a strong foundation for the design of the DigitalEd.ie knowledge platform (see Figure 1). The TLO planned to launch the Digital Education platform in quarter 2, 2020. However, when COVID-19 broke out in Ireland in March 2020, this quickly accelerated the TLO plans, and the launch was brought forward by several weeks to support the crisis unfolding. In addition, a suite of specialist online clinics and LTA support services emerged to guide teaching teams and students' engagement with remote learning.

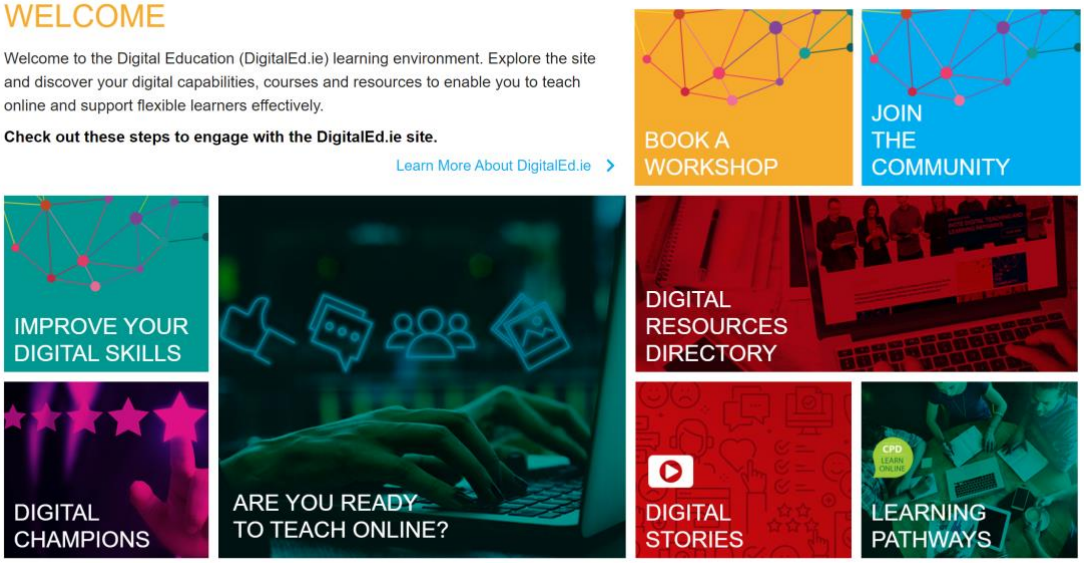


Figure 1: DigitalEd.ie Knowledge Platform

The GMIT Teaching and Learning Office, led out on the design and coordination of a range of rapid response initiatives to support staff and students. This aligned well with the outputs emerging from the DigitalEd.ie Knowledge platform resources and services suite (see Figure 2, Graphic illustration on DigitalEd.ie development). In parallel to this, online sessions were opened up to IT Sligo and LYIT as part of the DigitalEd.ie and iNOTE project.

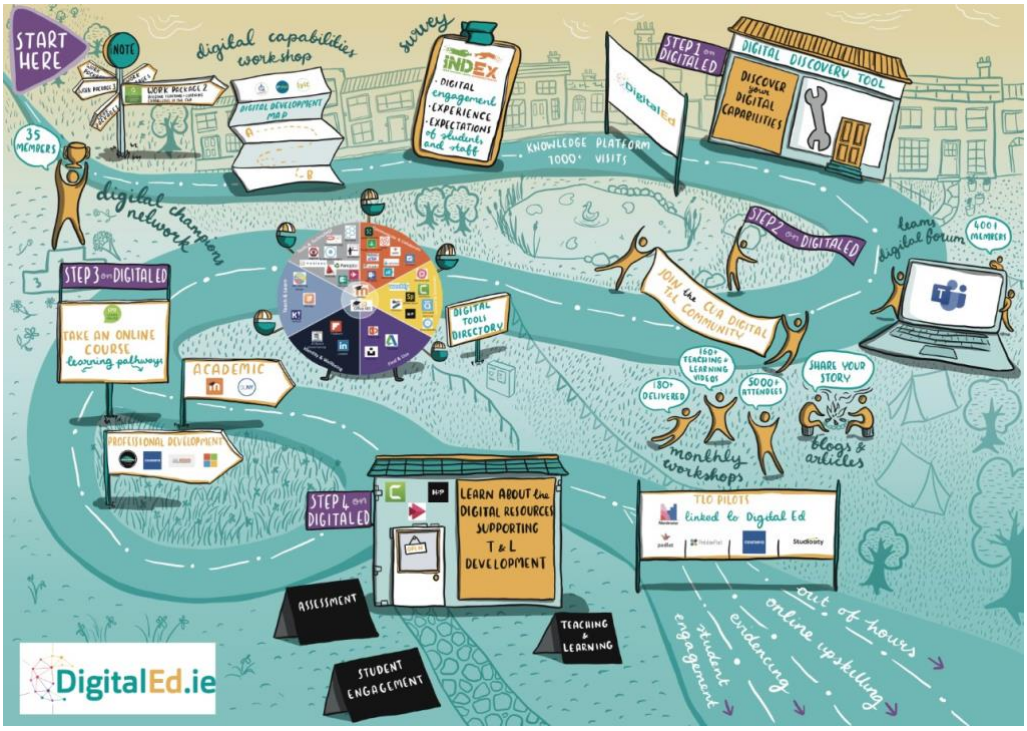


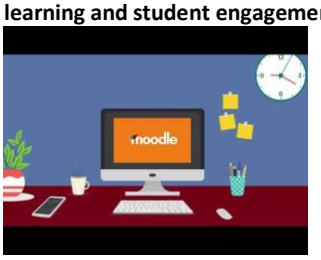
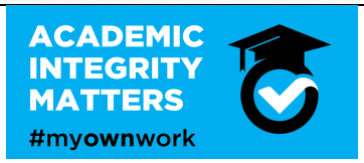
Figure 2: Graphic Story on DigitalEd.ie Developement

During the crisis of March-May 2020, collaborative discipline teams emerged, and a team of Digital Champions supported each other through various online panel sessions, sharing best practice in digital teaching and

remote learning. To further support the digital transformation challenges emerging, GMIT Executive Board {EB) established the Blended and Online Learning Transformation (BOLT) initiative, to provide further COVID-19 rapid response supports, that would impact every functional area in the institute. The BOLT steering group was established in April 2020 to develop a plan for remote learning in the 20-21 academic year commencing in September 2020. The steering group included: A chair, member of the EB; members of various academic departments; academic affairs administration; Teaching and Learning Office; IT Services; and the Student's Union. The rapid response initiatives implemented since March 2020, through BOLT and DigitalEd.ie, that have played an important role in transitioning to teaching, learning and assessment online, are outlined in Table 1 from items 1 to 17.

Table 1: Rapid Response Initiatives implemented in GMIT in response to COVID-19 DigitalEd.ie and BOLT.

Response Initiative	Description	Who benefited?
1. Digital Teaching & Learning Knowledge Platform	A Digital Teaching and Learning education platform (see Figure 2), providing access to digital learning pathways, a discovery tool, digital stories, a digital resources directory, a digital champions network and a digital education forum. The platform can be accessed at https://DigitalEd.ie	Lecturers in GMIT, IT Sligo and LYIT *It is also accessible to the higher education sector under a Creative Commons Attribution-Non-Commercial-Share Alike 4.0 International Licence.* ***9,000+ visitors recorded to date (as at Sept. 2021)***
2. AMA Clinics – Ask Me Anything Clinics	Online One-to-One Clinics with the TLO team of Learning Technologists to troubleshoot online teaching challenges with Moodle, Teams and more and to assist in redesigning of a module or assessment for online delivery.	All Lecturers in GMIT ***400+ AMA clinics to date (as at Sept. 2021)***
3. Graduate Student Mentors	Student mentors to assist the students with online engagement and to follow up where there is lack of engagement.	All Students in each academic Dept. in GMIT **18 Graduate Mentors in place supported by BOLT 2020-2021.**
4. Digital Academic Champions	A programme developed to allow digital champions, who have undertaken formal training in digital teaching and learning to mentor their colleagues in online delivery in each academic department.	All Lecturers in GMIT + 6 Champions established in IT Sligo and LYIT collaborating and sharing practice. **18 Digital Champions in place as a mentor in their academic department since May 2020.**
5. PASS Student Leadership Programme	**Peer Assisted Study Sessions (PASS)** are designed to help first year students cope better with all aspects of life at third level and focus on student integration, engagement, support, empowerment, and leadership to help students quickly adjust to third level life. As a response to COVID, PASS moved to online delivery to include an online PASS Leader Training Programme which included more than 60 student leaders trained to deliver weekly online PASS sessions. A PASS Academic Champion team, mentor PASS Leaders across the institute and first year students promoting engagement with first year PASS study sessions in an online learning environment.	First Year Students **60 student leaders leading weekly timetabled online PASS sessions on MS Teams across GMIT.**
6. Student Hub – Online Portal	From Sept. 2020, GMIT established a central student portal 'one stop online shop' where students can gain access to a variety of student supports and information on studying, online assessments, IT services, campus information, health and wellbeing, student life, finances, student rights and responsibilities, and planning for the future.	All Students in GMIT **Supported by the BOLT initiative serving all students.**
7. GMIT Healthy Campus	A committee of staff and students established since 2019, to promote health and wellbeing throughout the	All Students & Staff in GMIT

	Institute's mission, strategy, policies, plans and practices wherever possible. As a response to COVID, Healthy Campus launched a series of online services and activities that students and staff can avail of to include virtual staff and student choirs, online fitness classes, mental health training programme for staff, online Smart Consent training programme for students, and various online campaigns and promotions addressing healthy eating, physical health, mental health & wellbeing, and sexual health & identity.	
8. Student Success – Online Learning Support Guides	In response to COVID-19 a range of resources were developed by TLO to support students learning online, and include: A short animation explaining the **steps to success in online learning and student engagement in GMIT.**  A short guide for students is also available at this link covering steps to success and some practical advice for GMIT students learning online during COVID-19 (published in March 2020).	All Students in GMIT
9. GMIT's Digital Learning Charter	**GMIT's Digital Learning Charter** outlines our mutual responsibilities and provides a framework for managing our communication and behaviour in a digital world. It should be taken as a statement of our shared values rather than as a rule book. It illustrates the way in which members of GMIT staff and students should work collaboratively so that everyone can benefit. GMIT will aim to support all our learning community to engage in a safe and responsible manner when engaging in digital learning. GMIT Digital Charter is available at this link GMIT Digital Communication Principles animation video is available here. **GMIT Digital Communication Principles** 	All GMIT staff and Students **Supported by the BOLT Initiative.**
10. Academic Integrity, GMIT Student Guide	 Student Guide to Academic Integrity in GMIT is available at this public link and here on the Student Hub	All GMIT Students and Staff
11. GMIT Library Online	**The Library developed an online library support service for flexible online learners:** • LiveChat implemented since April 2020 • Help FAQs implemented since April available 24/7 • Communication via generic library email: library@gmit.ie • Regular online newsletters Note: The online services are staffed by all library staff across four campuses.	All GMIT Students and Staff

12. Remote Teaching Technology Toolkit	Each member of the academic and professional services community in GMIT was supported through the BOLT initiative with a technology toolkit to enable online teaching and remote working and student engagement.	All GMIT Staff **Supported by the BOLT Initiative.**
13. Online Labs/Practicals access via elabs Eiricom	GMIT have investigated and implemented a solution across all our campuses where our physical laboratories including 55 labs to date and incorporating 1140 PC's are **available for online and remote delivery of teaching and learning through the Eiricom Connect Software platform.** https://elabs.gmit.ie/EricomXml/index.html	All students partaking in lab based practicals – allowed students to access computer labs remotely. **Supported by the BOLT Initiative.**
14. Return to Campus Group	A Committee was established to manage the safe reopening of GMIT to include communicating updates with regard the planning for the next academic year to all staff and students, implementing the 3 Step Process prior to returning to campus, and other works (e.g., extra cleaning, installation of extra hand washing stations, completing risk assessment of each area, modifying some workspaces, signage). The aim is to have a safe working environment for staff and students and to keep GMIT COVID-free.	All GMIT Students and Staff **Supported by the BOLT Initiative.**
15. Online Proctoring Project	In 2019-2020 a pilot of online proctoring with PROCTOREXAM (EU company) took place in GMIT School of Business in collaboration with the TLO. The outputs from this pilot were presented in an experience report and case study and this led the way for the Exams Office in GMIT to establish rapid response solutions to high stakes online assessments/exams during COVID-19	GMIT School of Business in 2019/20 and wider impact rolled out in 2020/21 for GMIT high stakes assessments. **Supported by the DigitalEd.ie project and the BOLT Initiative.**
16. First Year Student Induction Course	Developed by TLO and Student Services, GMIT Students completing this course become familiar with GMIT expectations: **who we are; what we do; and how we can help you throughout your time in college.** This course can be accessed here.	First Year GMIT Students **Supported by the BOLT Initiative.**
17. IT Skills Course for GMIT Students	Developed by IT Services, GMIT students successfully completing this course have the **IT skills required to fully engage with distance education in GMIT over the academic year**. The IT Skills course can be accessed here.	All GMIT Students **Supported by the BOLT Initiative.**

4. Feedback from Stakeholder Engagement

By December 2020, the impact on staff engagement and the development of digital capabilities was wide ranging (see Section 5, Impact of DigitalEd.ie initiatives).

In addition, Figure 3 and Table 2 presents overall staff feedback on clinics/webinars provided and how they benefited from the engagement. The majority either agreed or strongly agreed that sessions positively enhanced their knowledge and skills and increased their confidence levels in their ability to teach online or use technology more effectively.

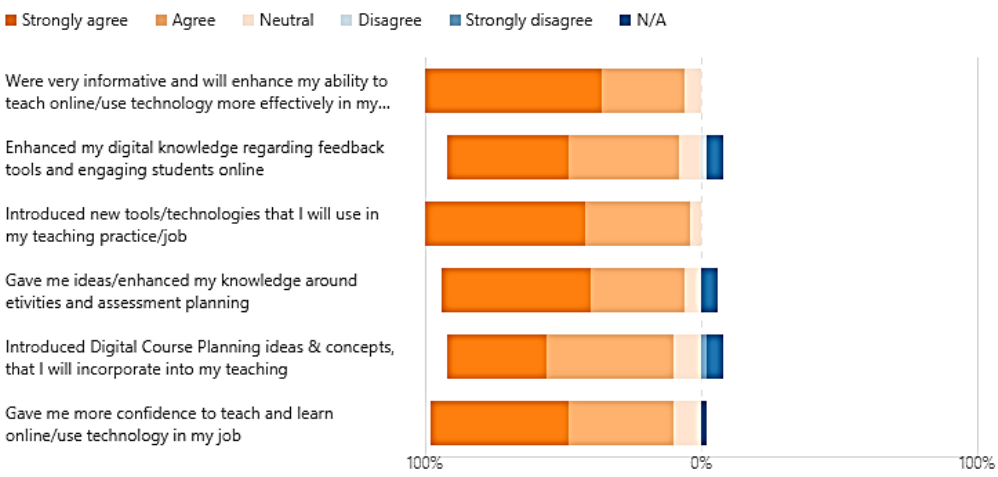


Figure 3: Benefits to attending the DigitalEd development sessions

Further comments are presented in Table 2. The commentary is categorised under the common teaching and learning themes that emerged from the feedback obtained.

Table 2: Feedback commentary and related teaching and learning theme

Teaching and Learning Theme	Commentary
Student Engagement	*"…great variety…atmosphere was very positive and supportive. Some had breakout groups which was great to meet colleagues and discuss…"* *"It was great to get an opportunity to meet other colleagues online and to share their resources and skills. A lot of ideas and tips were also added to the forum and links shared to extra resources was great too. Having the sessions recorded was a positive so the videos are there to go back over…"*
Active Learning Techniques	*"…very well presented and knew the content and how to apply it across disciplines. Also, the opportunity to practise the methods e.g., planning blended learning for modules and spend some time with the technology…Having advice on hand and shared experiences from staff was really useful in getting ideas of how you could apply the methods and technology"*
Peer Learning	*"…highly informative and everyone was very engaged and supportive. I like that nobody felt silly asking the simplest of questions and I hope GMIT continues to host these during 2020/2021 as they are needed"* *"Very good Teaching and Learning Q&A clinics and saved resources provided for follow-up…one-to-one advice would be most welcome heading into Sept 2020 in adapting what we've learned to our modules and individual practices."*
Online Learning	*"…remote access was very convenient and excellent. Content was engaging and input from colleagues highlighted the relevance and application of many elements of the technology to teaching. I felt empowered to engage with online learning technologies in the future"*
CPD Level Communications	*"…well-organised, informative and relevant webinars…there may be value in providing an indication of the level at which each webinar is 'pitched' e.g., level 1, beginner, etc. This might prevent those of us who are just about keeping our heads above water in the digital 'ocean', from that sinking feeling".*
	"even though the courses were fantastic, I found it a bit overwhelming with all the information coming at me from all sides every day. I really wanted to

COVID impact on time and teaching practice	*complete all the programs as they became available, but it was an impossible task with everything else that was taking place at the same time; student needs, school meeting; Team meeting etc…"*
Supportive Online Learning Community	*"Great to be able to partake of sessions via webinar and to have sessions recorded. Very easy to sign up for sessions, presenters were really good…. created a very good sense of community and goodwill. Even by taking a course that was deemed introductory or basic I learned so much. Leads me to believe there is nothing basic. We all learn something."*
Value of CPD in Teaching and Learning	*"…fantastic to have had the opportunity to uptake so many valuable training sessions. I learned something from each one and really appreciated all the guidance on where to find your level in all this. Also, the obvious sense of community support really felt good! I truly don't know how it was pulled together so quickly…"*

In addition, a focus group has taken place with the CUA Digital Champion community (December 2020) exploring the value and impact of the DigitalEd.ie knowledge platform. The focus group session also explored areas for enhancing DigitalEd.ie and the training and mentoring supports provided during the COVID-19 online teaching emergency.

Under the theme of staff support, 'DigitalEd Show and Tell/Showcase' sessions were welcomed, particularly when themed under topics such as 'technology based assessments' or 'student engagement strategies'. Champions noted, "sometimes a live session is needed more than a demonstration recorded video. Colleagues enjoy asking questions and experiencing the live show and tell". In addition, focus group participants (n=10) also outlined the need to have resources which take into account and promote principals such as Universal Design for Learning (UDL), promotion of engagement through technology and even how assessments are designed online:

> *"That extends even beyond the whole digital platform. Even in terms of UDL and you know there's people doing really good stuff, but you only find out about it through networking or media sources"*

Finally, the participants, highlighted a strong preference for an informal workshop in which people share their experience of implementing a certain digital tool or even their teaching practices which have a type of principle which underpin them i.e. Universal Design for Learning, Student-Centred learning:

> *"For the last year and a half we would meet up over coffee (now online, previously in person) and it would be very informal with staff speaking for five minutes about their area and what worked well for them from an online perspective and what technologies they've used"*

Another example from another participant who outlined the similar approach taken on their campus:

> *"About once a month with the use of breakout rooms we would have a breakout room for example: business, another for science, engineering etc. where a couple of people could join each group depending on how many people attend and share teaching practice ideas".*

A word cloud presented in Figure 4, highlights the key discussion themes and topics explored during the focus group session and how Digital Champions play a key role in the ongoing enhancements to the DigitalEd.ie knowledge platform and associated services and resources.

Figure 4: Key discussion topics and themes explored in the Digital Champion focus group (December, 2020).

5. Impact of DigitalEd.ie Initiatives

Through dedication, collaboration, and innovation, GMIT and the wider CUA transitioned teaching, learning and assessment online smoothly. The scale of what was achieved and its alignment to digital transformation strategic objectives, has the potential for transfer of learnings to other higher education institutes in Ireland and internationally.

By June 2021 the impact on staff engagement and the development of digital capabilities was wide ranging and included:

- 300+ Ask Me Anything (AMA) Clinics delivered to academic staff covering digital learning and teaching skills.
- 200+ webinars/workshops delivered online on digital T&L development strategies.
- 7,000+ CUA member registrations across the webinar series
- 100+ teaching and learning office video demonstration video resources produced and available on the TLO channel.
- 50+ Learning, Teaching and Assessment resources/special guides developed.
- 30 GMIT staff completed an accredited level 9, learning pathway in Technology Enhanced Learning or Digital Teaching and Learning, and 18 graduates became Digital Academic Champions, providing one to one and small group mentoring sessions in their academic departments.
- A further 15+ staff across the CUA signed up in June 2021, for the Digital Teaching and Learning (DTL), L9 (10 ECTS) module award.
- 9,000+ visits have been recorded to the DigitalEd.ie knowledge platform enabling self-directed learning and a range of digital education resources. The DigitalEd.ie platform was widely promoted on social media during the COVID-19 emergency, and as a result further higher education institutes have accessed the platform for support and guidance.
- 10 specialist student remote learning support resources and services have been established to help student's engagement with online learning.

- A one-stop shop (online portal) was set up for students called the 'GMIT Student Hub'. There have been 779,339 visits to the Hub since launching in September 2020. The more popular areas of the hub include *Study Skills, Exams/Online Assessment Guides and My IT.*
- 18 student graduates were recruited in August 2020, to provide mentoring and support to students from first year to final year, and create an online sense of belonging to GMIT.
- Top digital T&L topics where academic colleagues sought support and guidance from T&L rapid response clinics and workshops include: *Assessment Design and Set-up; Moodle; H5P; MS Lens; Breakout Rooms; MS Stream; OneNote; Learning Design Strategies; Class Management; Structuring and Online Lecture; Creating Video; TEL tools; Gradebook; online whiteboard; student engagement strategies.*

6. Conclusion

Extraordinary goodwill was demonstrated by those who teach, learn, support and lead in GMIT, and much was learned for the future in our digital transformation development journey. A cycle of continuous improvement in digital education is ongoing in GMIT, through action research studies underway on the initiatives outlined in this paper, and from reflective evidence generated from a wide range of stakeholders. This is critical to our digital transformation journey, which is current today, but it will also be crucial in the post-COVID-19 context, in which the use of blended and online learning is only expected to increase in GMIT and across the higher education sector globally.

Key learnings from the journey to date include:

- Undertaking the digital capabilities audit and evaluation in June 2019, proved invaluable to designing a platform for digital education to support higher education staff.
- Creating a suite of Learning, Teaching and Assessment (LTA) resources for managing the online learning environment, provided much needed support to fill the gaps of knowledge with regards teaching and assessing online.
- Conducting open clinics and discussion forums with colleagues and gaining feedback on where they needed the most help, informed the development of various guides.
- Establishing the BOLT steering group, representing a wide range of disciplines and functional areas in GMIT, resulted in the rapid rollout of a range of supports for staff and students.
- Creating a Digital Champions team co-ordinated by TLO, provided representation across every discipline and 'a mentor' to help navigate the challenges with moving online across 14 academic departments. The network is proving invaluable and has resulted in GMIT gaining a wider reach and increased engagement in building digital capabilities and developing alternative assessment approaches.
- Feedback from colleagues through various studies in 2020 have provided evidence on the value of 'LTA Showcase Events and Forums', where lecturers show and tell what is working well and what is not working well. This peer learning, collaborative forum facilitated by TLO, has proved to be a supportive and collegial network and has helped build confidence among the academic community in teaching and assessing in the online learning environment.
- Recruitment of a team of graduate student mentors has been a great success and each Head of Department (HoD), the teaching teams and the students have benefited from their involvement. Graduate student mentors have played a key role in creating a sense of belonging and retaining students in the online campus. They acted as 'trouble shooters' working with HoD's and student groups from first year to final year.

- Providing for self-directed and directed accredited digital teaching development courses provided 'choice' and 'options' for colleagues and enabled lecturers to engage with learning over the summer months (see Figure 5 & 6).
- Providing for a monthly TLO timetable of workshops and drop-in clinics (140+ workshops and 150-+ AMA clinics to date) has been warmly received by the academic community, and this has led to the development of a 'TLO services module design model' that provides support from concept, right through to the build, design, and implementation stage (see Figure 7).

Figure 5: Self-Directed Digital Development Pathway

Figure 6: Accredited Digital Development Pathway

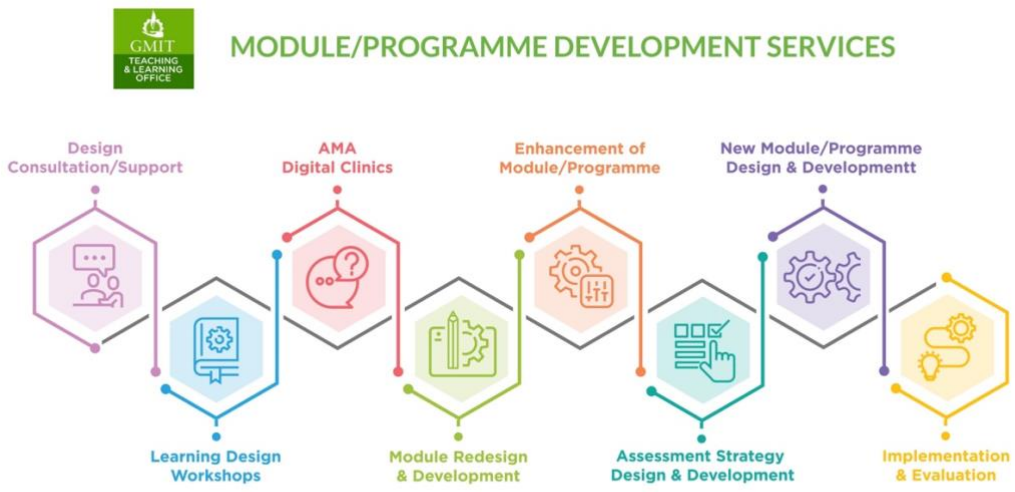


Figure 7: TLO Module/Programme Development Services

To conclude, the DigitalEd.ie knowledge platform and associated COVID remote teaching and learning services implemented in GMIT and across the CUA between 2020-21, has accelerated the rate of teacher engagement with digital education and technology enhanced learning tools. As a result of staff upskilling in digital education, students have also benefited from this, through the range of digital engagement and learning tools (i.e., live class discussions, group work, group discussions, polls, quizzes, icebreakers, presentations, clinics, and social activities), that they have been exposed to, and all of this will support them in further education, employability and the world of work.

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Children's Right to Participate in Early Childhood care and Education settings and relative innovatory supportive digital tools for ECCE professionals' development

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Abstract

Young children's participation is key to developing a culture of human rights, democracy, and rule of law and according to Council of Europe (2017) and United Nations (2005). In these terms, children's right to participate is described as a key aspect in the framework of educational quality, and the positive relationship between children's right to participate and early childhood care and education (ECCE) quality is already documented. Although this concept is not new to ECCE professionals, its application seems to remain a challenge within everyday activities. It is thus important for ECCE professionals to reflect on this right and on the practices towards its promotion, in order to be able to supply high quality education. The paper presents the innovatory attempts regarding the digital tools developed within the PARTICIPA Erasmus+ project (Professional development tools supporting participation rights in early childhood education) aiming to involve three target

group -directors, teachers and teachers' assistants- working in all types of early childhood care and education settings, so that have a digital space to reflect about children's right to participate and its implementation. More specifically, the paper presents (a) a training program targeting the ECCE settings' professionals provided through a massive open online course (MOOC) in 5 languages and disseminated in an online learning platform, focusing on the theoretical and practical aspects of children's right to participate (i.e., state of the art, relevant pedagogical practices), (b) toolkits (i.e., validated self-assessment questionnaires) for ECCE directors and teachers and teacher assistants supported by discrete qualitative studies.

Keywords: children's right to participate, Early Childhood Care and Education, supportive digital tools, professionals' development.

1. Introduction

Participation is a fundamental right of all children (Burger, 2018). The United Nations Convention on the Rights of the Child (CRC; United Nations, 1989) set the legal framework for recognizing children as rights-holders and, more specifically, entitled to the right to participate. According to the CRC, children have the right to express themselves in all matters pertaining to them, from the family to the community context. Thus, participation is described as a complex process, embedded in cultural, social and relational contexts (Lansdown, 2005).

Children's participation and decision-making in society must be protected and encouraged from an early age (Council of Europe, 2017; United Nations, 2005). As such, participation must be implemented in education settings, namely in early childhood education and care (ECEC), as these are fundamental microsystems for children's development (Sylva et al., 2010). Notably, participation has been progressively described as an important criterion for ECEC quality (e.g., Sheridan, 2007).

Participation has been informed by diverse fields of knowledge (e.g., sociology of childhood, social policy, education), and various theories and models (Percy-Smith & Thomas, 2010). This profusion of theories and models, together with important aspects such as professionals' beliefs, curriculum guidelines, or institutional norms, values, and objectives, have been deterrents to the effective implementation of children's participation in ECEC (Samuelsson et al., 2006).

Importantly, professional development initiatives and reflexive practices (e.g., Mesquita-Pires, 2012; Nah & Lee, 2016) are described as facilitators of change towards the promotion of children's participation. Therefore, this paper aims to offer a short overview of PARTICIPA, an innovative Erasmus+ program proposing digital tools for professional development - a Massive Open Online Course (MOOC) and self-assessment tools -, to support ECEC teachers, assistants, and coordinators in promoting children's right to participate from the youngest ages.

2. Children's right to participate: Growing recognition and the critical role of key organizations

Children's participation, an essential element of human-rights-based societies, has gained recognition in society and in research. Participation is dependent on children's agency and competences, and on features of the family, community, and education contexts (Burger, 2018; Hart, 1992; Lansdown et al., 2014). Unfortunately, children seem to be one of the last groups in society to be granted access to rights, and more particularly to participation rights (Franklin, 2002). Nonetheless, over time, and largely determined by the CRC (United Nations, 1989), there have been major changes in the status and space occupied by children in society, accompanied by a shift from a protectionist (i.e., children as dependent on adults, subject to their control, and in need of protection) to participation paradigms (i.e., children as social actors and rights holders, with interests, voice, and competence to participate in decision-making) (Thomas, 2007).

Ratified almost universally, the CRC was crucial for framing and guiding the nature, scope, and implementation of children's participation rights in diverse social spheres. Article 12 is particularly important, as it states children's right to express their own views, but also their right to have them considered. Importantly, the CRC does not set a minimum age, nor does it limit the contexts in which children can express their views and have them heard. Instead, children's participation is recommended from an early age and, therefore, considered indispensable for creating a positive social climate in ECEC settings, with adults described as crucial to support children's participation, through the adoption of child-centered practices (Council of Europe, 2017; United Nations Committee on the Rights of the Child, 2005, 2009).

This right has been legislated at the European level, in the Charter of Fundamental Rights of the European Union (European Union, 2012). In the European Union, the promotion of children's participation in decision making is considered a reflection of investments in children and in their well-being (European Commission, 2013). Therefore, it has been recommended that all member states of the European Union implement mechanisms towards the promotion of children's participation in all decision-making processes affecting their lives, going beyond mere children's consultation, and invest in capacity building for practitioners (European Commission, 2015).

More recently, the European Commission (2021) has launched a new Strategy on the Rights of the Child, becoming committed to undertake actions to empower children to be active citizens and members of democratic societies, and to strengthen expertise and practice on child participation among Commission staff and the staff of EU agencies. Taken together, these initiatives and legal instruments have been important to assure the establishment of links between international and national levels, either defining or fostering the promotion of children's right to participate.

3. Conceptualizing the right to participate

Participation is a multidimensional and polysemantic construct - often understood as involvement, influence, agency, or democracy - that can be conceptualized and exercised in different ways (e.g., Clark, 2005; Shier, 2001; Sinclair, 2004). Understanding children's participation involves considering dimensions such as the level of participation (i.e., the degree of power sharing between the adult and the child), the decisions (i.e., type and focus of decision-making), the nature of the activity (i.e., type, duration), and children involved (i.e., which competences, interests, and characteristics) (Sinclair, 2004).

Participation is frequently described in terms of levels or stages, and diverse models of participation have been proposed. Hart proposed one of the most influential models of participation, suggesting the existence of eight levels of participation, three of which referring to experiences of non-participation (Hart, 1992). Despite influential, Hart's (1992) ladder received criticism (Horwath et al., 2011) and new models emerged suggesting non-hierarchical structures of participation (Treseder, 1997) or different degrees of commitment to the process of empowering children (Shier, 2001).

Moreover, to experience participation, children need to have access to conditions and opportunities to express their perspectives and choices, with appropriate support and information, in a space with the potential for them to be heard and to have their perspectives respected and legitimated (Lundy, 2007). For this reason, Lundy drew the attention of policymakers and practitioners to the distinct, though interrelated, elements of space, voice, audience, and influence (see Figure 1):

- **Space** is based on the premise that children must be given a safe and inclusive space in which they are encouraged to express their views; this is a prerequisite for their meaningful participation in

decision-making. Moreover, the existence of space implies that adults "(…) take proactive steps to encourage children to express their views; that is, to invite and encourage their input rather than simply acting as a recipient of views if children happen to provide them" (Lundy, 2007, p. 934).

- **Voice** involves encouraging children to express their views. Importantly, the right to express their views "is not dependent upon their capacity to express a mature view; it is dependent only on their ability to form a view, mature or not" (Lundy, 2007, p. 935). Thus, sufficient time to understand relevant issues and access to child-friendly documentation and information are important prerequisites to meaningful and effective child participation.
- **Audience** assumes that children's views must be listened to by someone with the responsibility to make decisions. In fact, "children have a right to have their views listened to (not just heard) by those involved in the decision-making processes" (Lundy, 2007, p. 936). This suggests the need to "(…) ensure children at least have a 'right of audience', an opportunity to communicate views to an identifiable individual or body with the responsibility to listen" (Lundy, 2007; p. 937).
- **Influence** means that children's views must be acted upon, as appropriate. Specifically, the model proposes that "(…) at some point, attention needs to focus on the extent of influence; what constitutes the 'due' in the 'due weight'." (Lundy, 2007, p. 937). Lundy adds that the "(…) challenge is to find ways of ensuring that adults not only listen to children but that they take children's views seriously. Even if this is not always possible, children must be told how their views were considered and whether they had any influence or not.

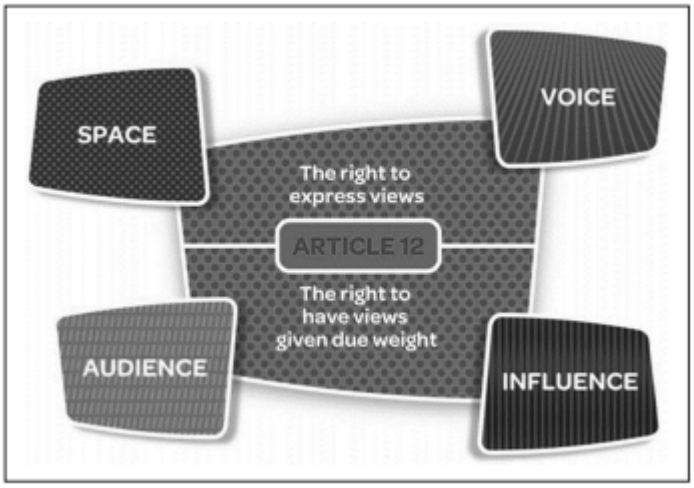


Figure 1 Lundy's (2007) model of participation. Retrieved from the Irish Government National Child and Youth Participation Strategy (2015–2020), based on '"Voice" is not enough: Conceptualising Article 12 of the United Nations Convention on the Rights of the Child'.

Extensively used in policy and in practice, this model has the potential to be applied to the work with children, across distinct fields and contexts. Nonetheless, to our knowledge, it has not been applied to ECEC, nor to professional development initiatives with ECEC professionals. Thus, the tools developed within the PARTICIPA project will be structured taking into account the Lundy model of participation.

4. The right to participate in ECEC settings

Participation is most meaningful when it is rooted in children's everyday lives (Percy-Smith & Thomas, 2010) and since the earliest ages (Council of Europe, 2017). Therefore, there is broad consensus towards the importance of considering children's perspectives in ECEC (e.g., Bae, 2009; Clark & Moss, 2005; Emilson, 2007; Sheridan & Samuelsson, 2001). For instance, children must be able to express their views, preferences, and

choices regarding, for instance, where, when, or with whom to play (Correia et al., 2019); and the assessment of ECEC settings' quality must consider multiple perspectives, namely children's views and experiences (Katz, 2006).

Further, children's right to participate is described as key to frame ECEC daily practice and overall quality (e.g., Moser et al., 2017; Sheridan, 2007; Sheridan & Samuelsson, 2001). Based on this, there is growing interest in how adults can effectively support shared decision-making processes in which children are actively engaged (NAYEC, 2009; Sandberg & Eriksson, 2010; Venninen et al., 2014). In effect, participation in ECEC can be promoted in many ways, through processes such as active listening, consulting children, or giving them the opportunity to initiate and propose their own products or ideas (e.g., Pascal & Bertram, 2009). Nonetheless, sometimes, professionals encounter barriers (e.g., adult–child ratios, workload, and school structures characterized by adult power) to the meaningful implementation of children's right to participate in ECEC (e.g., Koran & Avc1, 2017; Venninen et al., 2014).

Importantly, children's participation in ECEC takes place in the context of relationships and interactions established between children and ECEC professionals, such as ECEC teachers, whose role is crucial (Broström et al., 2015). Thus, to exert their right to participate, children must be capable of making their own decisions within relationships with significant adults that empower them as agents and rights holders (Corsaro, 2005; Lansdown, 2005). Furthermore, research has suggested that teachers' practices promoting a positive climate in the ECEC classroom, through positive relationships, affect, communication, and respect, are positively associated with children's perceptions of their own experiences of participation (Correia et al., 2020).

These distinct agents, roles, and interactions shape children's experiences of participation in ECEC and illustrate the complexity of participatory interactions, suggesting different levels of analysis, from individual values to practices and actions (Vieira, 2017). Together, they contribute to children's participation experiences, with potential benefits for children (e.g., Ebrahim, 2011).

5. Potential effects of the right to participate

Potential child-level benefits of children's participation include increases in children's self-esteem, self-efficacy, communication, negotiation, conflict resolution, and decision-making skills (e.g., Hart, 1992; Sinclair, 2004). The development of citizenship has also been proposed as an outcome of children's participation (Pascal & Bertram, 2009). Notably, participation is considered a key investment in children's wellbeing (e.g., Bradshaw & Mayhew, 2005; European Commission, 2013).

Furthermore, participation improves the organization and functioning of organizations, such as ECEC centres, and enables adults' respect for children's ideas, interests, and needs. (e.g., Hart, 1992). Improved organizational competence in listening to children's and professionals' voices should result in increased levels of perceived procedural justice thus increasing leadership legitimacy (Emler & Reicher, 2005).

Taking into consideration the individual, contextual, and organizational factors pertinent to the implementation of practices supporting children's right to participate in ECEC, and aiming at contributing to long-term improvements in ECEC classroom and centre quality, a multilevel professional development approach targeting ECEC teachers, assistants, and coordinators was designed. Our rationale was that teachers would not be able to address all the factors and barriers that influence children's participation by themselves; assistants also spend a considerable amount of time with children and play a crucial role in supporting and generalizing pedagogical approaches and coordinators are in the position to support teachers' autonomy in

implementing their visions regarding children's participation while mobilizing the necessary organizational resources to ensure their applicability.

Thus, PARTICIPA aims to empower ECEC teachers, assistants, and coordinators': (1) knowledge on children's right to participation; (2) positive attitudes regarding the design, implementation, and monitoring of practices that promote children's participation; (3) ability to identify, design, implement, and monitor practices enhancing children's right to participate; and (4) ability to work together, at multiple configurations of the ECEC centre, to identify, use, and sustain the individual and organizational resources needed to support children's participation.

In order to meet the abovementioned goals, the PARTICIPA project developed two (free, open) professional development resources: (1) a Massive Open Online Course (MOOC) on children's right to participate in ECEC, targeting teachers, assistants, and coordinators; and (2) self-assessment tools designed to support professionals (i.e., teacher, assistant, and coordinator's version).

6. A MOOC on children's right

A Massive Open Online Course (MOOC) was designed and subsequently developed, to support professionals in building competences needed for the provision of high-quality ECEC,. A MOOC is a cost-effective method for supporting the learning of both small and great numbers of ECEC professionals and will allow the provision of affordable (i.e., free), flexible (i.e., self-paced and accessible both at home and at the ECEC centre), inclusive (i.e., open to all; delivered in multiple languages), and interactive professional development. As ECEC staff often struggle to find time and necessary funding for engaging in professional development opportunities, a MOOC tailored to the specificities of ECEC, can be considered as a promising approach.

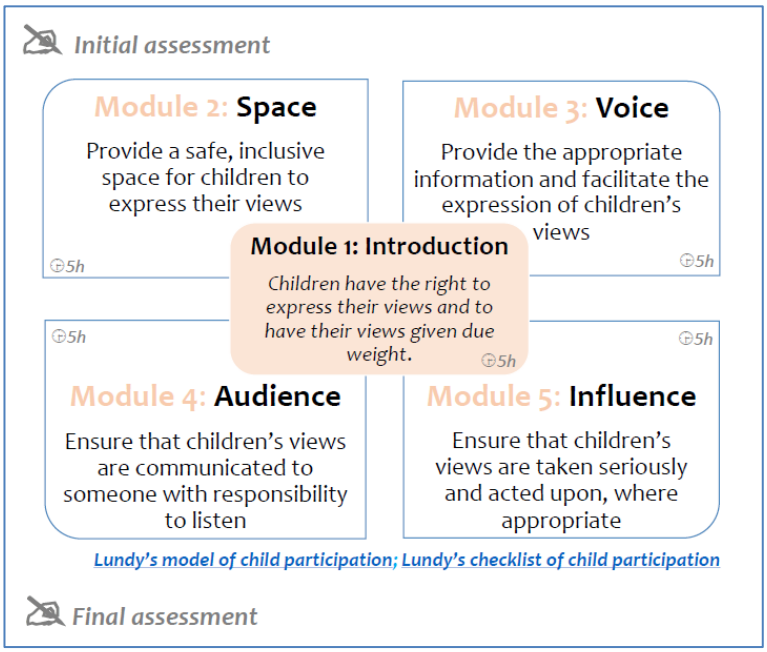


Figure 2 The structural organization of the MOOC.

Special care and effort was given to thesetting up the requirements of the course and to its instructional design. Starting from developing a prototype version of the course in English, we reached a number of aggreements on the instructional methodology, the approach, structure of the course, its content, duration, etc. Based on these, a modular course consisting of five modules was designed (see Figure 2). Prior to these, the MOOC

provides some general information regarding its scope and purpose, the target audience, practical aspects, namely,the duration (8 weeks), the workload (approx. 5 hours per week), the technical requirements, its level (3) according to EQF (see https://europa.eu/europass/en/description-eight-eqf-levels) and the certification a participant could obtain. Additionally, a course outline is available both in short and in detail. Moreover, an announcement forum and a discussion forum for the participants to share their experience and exchange ideas during the course are available.

Each module consists of a short description, the learning objectives and some keywords. It is structured in sections that include the learning material (in video and textual form), the activities, and library resources. Every module concludes with a quiz, that the participants need to successfully complete by obtaining a passing grade of 60% to proceed to the next module.

At the end of each module, participants are invited to participate in the Big Challenge, a project where they can apply participatory practices, collaborate with each other, exchange their ideas, and develop an in-depth understanding of the content of the course, by connecting theory and practice. Participants may choose a project among several options provided or select a project of their own thus improving improve their participation practices.

Throughout the duration of the course, participants have access to a MOOC glossary containing definitions selected or adapted from other sources matching the intentions and context of the MOOC, a common folder acting as a resource center, and the outline of the Big Challenge with options, activities, and tasks, per module.

To begin the course, participants need to complete a questionnaire sharing information about their prior knowledge regarding children' rights to participate. Participants are asked to indicate the level that best describes their current knowledge with the use of 20 statements on a scale from 1 to 5. Participants are asked to fill in the same questionnaire after they have finished the course, as a prerequisite to obtain their certificate of successful participation.

Next came the implementation of the course by means of integrating learning material into a Moodle LMS platform (https://moodle.com/). The course is structured using "topics format" where each page (module) is divided into sub-topics (reading material, video, activity, module evaluation and library resources). An additional topic also appeared in each module for purposes of better organization of the Big Challenge.

Following the evaluation of the course layout and the content by several users, the educational material was updated based on the users' comments and the final version was translated into Portuguese, Dutch, Polish, and Greek. Then, different versions of the MOOC were implemented, one for every language. Participants can opt for the language they wish to use (the international version and the national that corresponds to their country), using a drop-down menu available at the top of their browser.

In Figure 3 one can see an outline of the English version of the course, available at https://child-participation.eu/platform/. At area 1, on the left, we can see the topics of the course, i.e., the units wrapping the related learning objects., some general information, the five modules, and the two topics that participants have to visit before and after the modules. Area 2, at the top center, includes global resources that are available to all participants, no matter their nationality. This also holds for the useful information and the calendar appearing in Area 3 on the right. Area 4, at the center, also contains the Course modules and its learning units, according to the language a participant has selected from the drop-down menu in Area 5. All participants,

except for the managers of the course, are grouped based on their nationality so that they can view the appropriate leaning material.

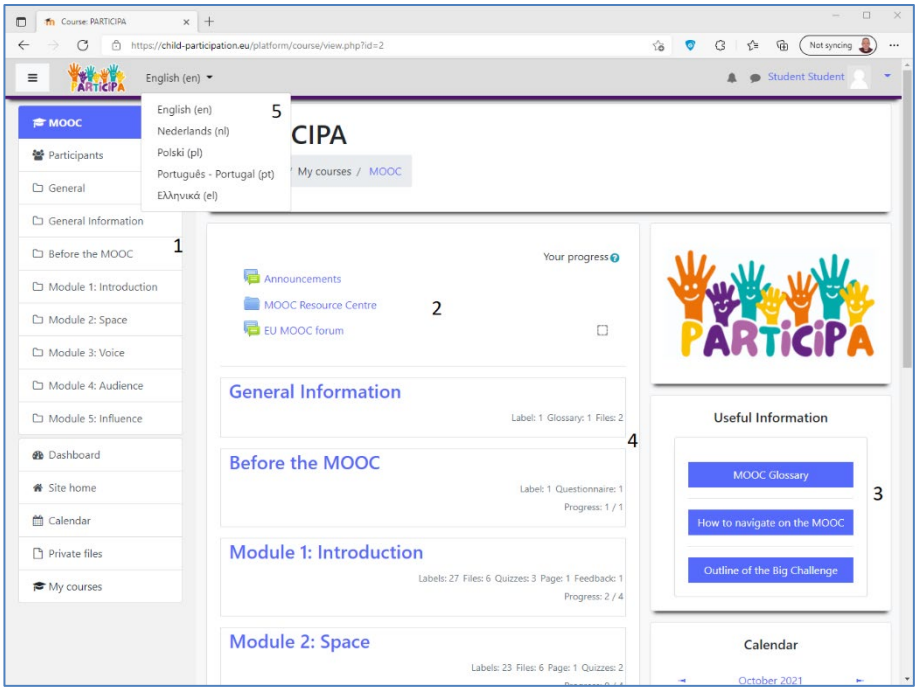


Figure 3 The outline of theEnglish version of th MOOC

The general information topic offers information about the scope and the target audience of the course, as well as the prior knowledge that one must have to participate. Some practical aspects are also discussed, along with the course outline and detailed information regarding the structure of each module. At the end of the topic, the glossary, a guide of how to navigate on the MOOC, the outline of the Big Challenge and a national discussion forum are available (see Figure 4).

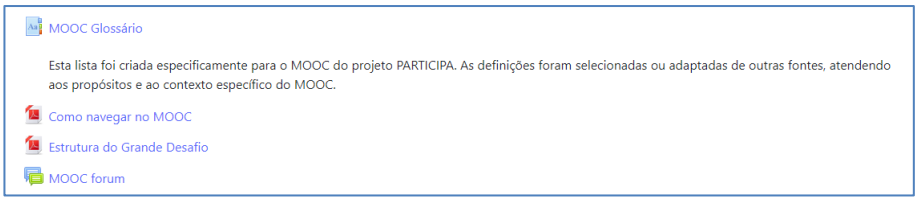


Figure 4 Resources of the General Information topic of the MOOC, in Portuguese

Prior to the first module, participants must fill in a questionnaire with information about their existing knowledge on children' rights to participate (see Figure 5).

Figure 5 Questionnaire with information about children's right to participate, before starting the MOOC, in Dutch.

Modules are organized into sections containing reading material, videos, activities. In the end, the module evaluation and library resources are available, along with the Big Challenge section. In Figure 6 an example on a module of the English version of the course is provided. One can see the reading material, the video and the activities in each section. The module ends with the evaluation section, the Big Challenge, and the library resources (see Figure 7).

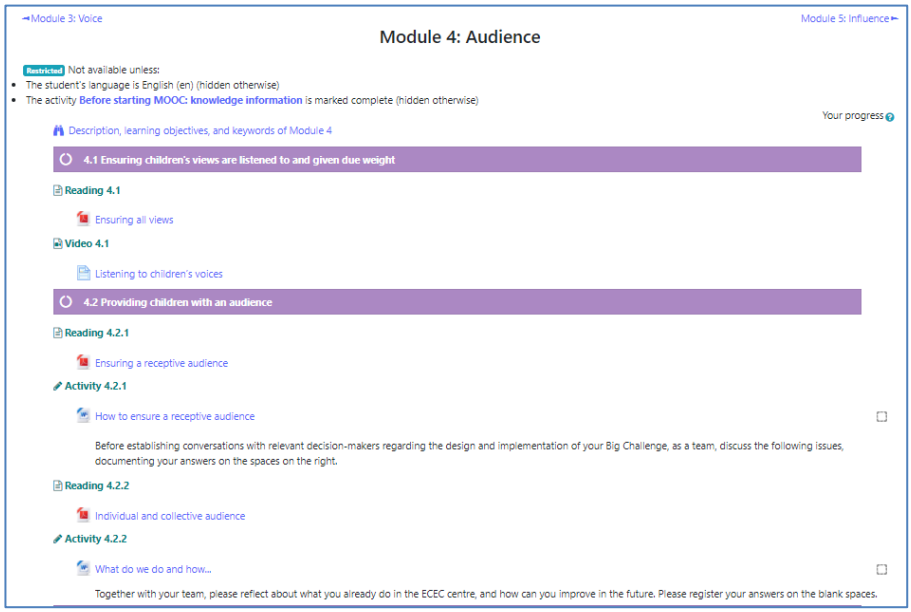


Figure 6 An example of the learing objectis of a module of the MOOC, in English.

Figure 7 An example of the learing objectis of a module of the MOOC, in English (cont.).

Following the final module, the same questionnaire is repeated, as a prerequisite for the certificate of attendance (see Figure 8).

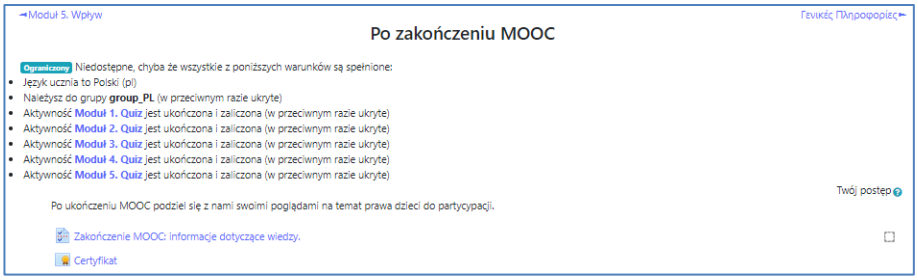


Figure 8 Questionnaire with information about children's right to participate,after finishing the MOOC, in Polish.

7. A self-assessment tool for supporting professionals

The PARTICIPA project consortium has elaborated a self-assessment tool for ECEC professionals to support high-quality ECEC through the implementation of children's right to participate. Two versions aim to support teachers and assistants in delivering high quality ECEC through participatory practices at the classroom level. A third version aims to support coordinators in enhancing participatory practices based on organizational resources and supports.

The self-assessment tool is an independent but complementary professional development resource to the PARTICIPA Massive Open Online Course (MOOC) on children's right to participate in ECEC, targeting teachers, assistants, and coordinators. The self-assessment tool is available free of charge via web.

This self-assessment tool is designed to support participants in enhancing participatory practices, based on their organization's resources. It was inspired by the testimonies of ECEC teachers, assistants and coordinators/managers from Greece, Poland, Belgium, and Portugal about the way they mould child participation in their settings. Children's participation was conceptualized following the Lundy model (Lundy, 2007).

7.1 Structure of the self-assessment tool

All items in the self-assessment concern practices with respect to promoting children's participation. The goals of these practices can be fulfilled through the use of a variety of strategies. The extent to which stakeholders already implement these practices is an indication of the extent to which children can participate in their setting. The items are structured around the five dimensions mentioned above: participative space, children's voice, audience of children's perspectives, influence, and contextual support for participation. Each dimension contains a number of questions that the participant must answer. Professionals who complete the online version receive personalized feedback.

Let us get to know you and your job: At the beginning of the questionnaire the participant is asked to answer some questions about his personal background and his previous work experience. Participation in this part of the questionnaire is not mandatory and if the participant does not wish to answer, he can continue to the next parts of the survey. The answers of this dimension will be used for demographic analysis.

1. Participative space*:* In a participative space, children are comfortable with themselves and feel free to express their perspectives. Professionals can create a participative space by having a respectful attitude towards children and adults in the centre and by promoting respect among children. In addition, in a participative space, they should enable children to act autonomously, for example to be able to create

opportunities for children to freely choose activities or access materials. To promote children's participation, it is important to be aware and responsive to children's needs, emotions, interests, and difficulties. To that end, the participant must answer 6 questions (teacher version, teacher assistant version, coordinator version) in a 4-point Likert scale (1: not at all to 4: to a large extent). Based on the participant's responses an average score is calculated regarding the dimension which corresponds to the specific feedback about the attention he gives to practices enhancing the participative space in his classroom.

***2. Children's voice**:* All children have a voice. However, sometimes professionals need to make additional effort to ensure that children can express their voice. Enabling children's voice requires that they communicate in a child-friendly way, so that children sufficiently understand the topic at hand. In addition, they need to actively identify the topics in which children find most relevant to participate. To enable all children to participate, professionals should facilitate multiple forms for children to express their perspectives, interests, and preferences. They can also support the development of children's skills and attitudes that help them express their perspectives. To that end, the participant must answer 9 questions in the teacher version, 7 questions in the teacher assistant version and 7 questions in the coordinator version in a 4-point Likert scale (1: not at all to 4: to a large extent). Based on the participant's responses an average score is calculated regarding the dimension which corresponds to a specific feedback about the ways for he uses to strengthen children's voice in his classroom.

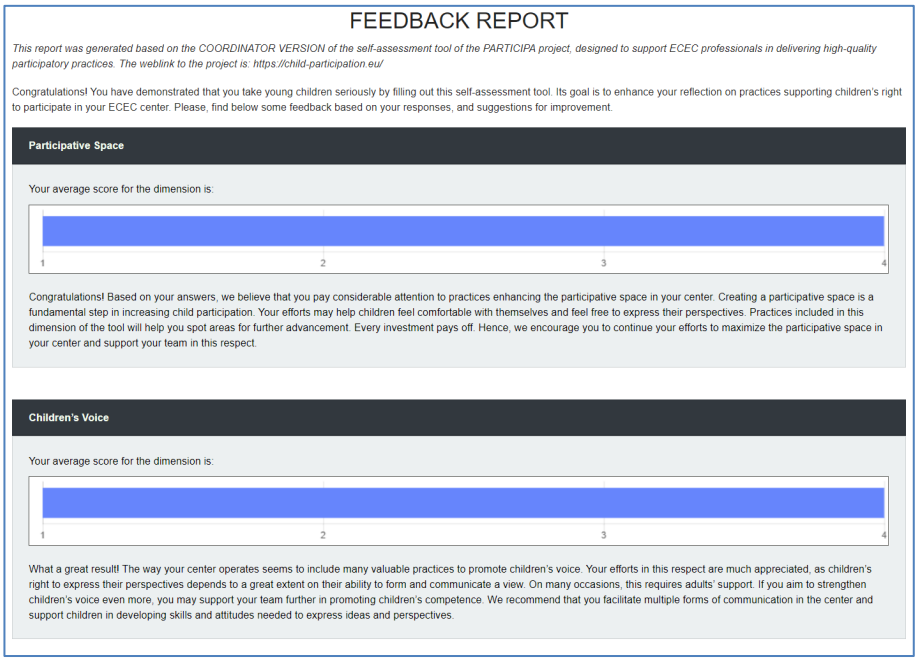
***3. Audience of children's perspectives**:* Audience refers to the people who need to listen to children's perspectives. When children express their views but these views are not addressed to the right person, it is possible that they will never be known, considered, and implemented. An effective way to promote children's participation is to inform the children regarding which people are responsible for making which decisions. In addition, professionals can give children opportunities to communicate their perspectives to the people who are responsible for the topic at hand. They can also make sure there is a process for communicating children's perspectives (e.g., a periodical meeting). In sum, 'audience' means that children's perspectives, needs, interests, and expectations are listened to and given due weight. To that end, the participant must answer 7 questions (teacher version, teacher assistant version, coordinator version) in a 4-point Likert scale (1: not at all to 4: to a large extent). Based on the participant's responses an average score is calculated regarding the dimension which corresponds to a specific feedback about practices that helps them to ensure an audience for the children.

***4. Influence**:* Professionals need to ensure that children's perspectives are acted upon, as appropriate. To achieve that, they may plan, organize, and monitor children's participation in decision-making. No matter how young they are, children's participation in decision making should be effective and meaningful. In some cases, children may be consulted. In other cases, they may collaborate with adults or take the lead. ECEC teachers must provide feedback regarding how children's perspectives have been used and how they have influenced the decisions. To that end, the participant must answer 9 questions in the teacher version, 8 questions in the teacher assistant version and 9 questions in the coordinator version in a 4-point Likert scale (1: not at all to 4: to a large extent). Based on the participant's responses an average score is calculated regarding the dimension which corresponds to a specific feedback about practices that enhance children's influence on their environment.

***5. Contextual support for participation**:* In a participative community, all professionals support children's participation and optimize their practices in close collaboration with each other. Moreover, children's families, visitors, and the local community are invited and encouraged to support children's right to participate. This

dimension is divided into 2 sub-dimensions. The first one concerns professionalization and collaboration within the team and the second one is about communication with the children's families and the wider community. Only for the coordinator version does a third sub-dimension exist, called "my own practices to promote the participation of my team" where the participant has to answer 5 questions in a 4-point Likert scale (1: not at all to 4: to a large extent). For the first sub-dimension the participant must answer 4 questions in the teacher version, 5 questions in the teacher assistant version and 6 questions in the coordinator version in a 4-point Likert scale (1: not at all to 4: to a large extent) and for the second one they must answer 5 questions in the teacher version, 4 questions in the teacher assistant version and 4 questions in the coordinator assistant version in a 4-point Likert scale (1: not at all to 4: to a large extent). The survey calculates an average score of each sub-dimension which corresponds to a specific feedback about a) experiences of professionalization and collaboration within the team and b) involvement of the families and the wider community, towards enhancing children participation and experiences.

***Feedback Report**:* At the end of the survey the participant receives an automatically generated feedback report following its submission, based on the answers they provided by completing the self-assessment tool. This report displays the average of the answers that the participant gave in each dimension in a graphical way and the personalized feedback below (see Figure 9). The participant is able to download the report in pdf format. They also have the opportunity to download a clean printable version of the self-assessment tool if they wish to complete the survey offline.


FEEDBACK REPORT

This report was generated based on the COORDINATOR VERSION of the self-assessment tool of the PARTICIPA project, designed to support ECEC professionals in delivering high-quality participatory practices. The weblink to the project is: https://child-participation.eu/

Congratulations! You have demonstrated that you take young children seriously by filling out this self-assessment tool. Its goal is to enhance your reflection on practices supporting children's right to participate in your ECEC center. Please, find below some feedback based on your responses, and suggestions for improvement.

Participative Space

Your average score for the dimension is:

Congratulations! Based on your answers, we believe that you pay considerable attention to practices enhancing the participative space in your center. Creating a participative space is a fundamental step in increasing child participation. Your efforts may help children feel comfortable with themselves and feel free to express their perspectives. Practices included in this dimension of the tool will help you spot areas for further advancement. Every investment pays off. Hence, we encourage you to continue your efforts to maximize the participative space in your center and support your team in this respect.

Children's Voice

Your average score for the dimension is:

What a great result! The way your center operates seems to include many valuable practices to promote children's voice. Your efforts in this respect are much appreciated, as children's right to express their perspectives depends to a great extent on their ability to form and communicate a view. On many occasions, this requires adults' support. If you aim to strengthen children's voice even more, you may support your team further in promoting children's competence. We recommend that you facilitate multiple forms of communication in the center and support children in developing skills and attitudes needed to express ideas and perspectives.

Figure 9: Feedback report sample

At the end of the survey the participant receives a feedback report which is automatically generated after the submission, based on the answers he gave by completing the self-assessment tool. This report displays in a graphical way the average of the answers that the participant gave in each dimension and the personalized feedback below (see figure 4). The participant can download the report in pdf format. He also has the capability to download a clean printable version of the self-assessment tool if he wishes to complete the survey offline.

***Survey tool technical details**:* For the development and supply of the survey tool an open-source platform called LimeSurvey (https://www.limesurvey.org/) was used. The system was built under the common

infrastructure of the digital tools of the project. The questionnaire is available to the public in the form of a web application (through browsers and devices).

A strong management panel for the administrators to manage the surveys is provided. In this panel the owners of the survey can monitor either in real time or not the answers of the participants. The participants' answers can be exported in many formats for further statistical analysis using all statistical tools available.

The aim of this tool is to encourage and support professionals' reflections. They may complete the tool individually or with colleagues from the center they work. Statements included in the tool may serve them as an inspiration or starting point for discussion. By using this self-assessment, someone demonstrates the intention to improve his practices with respect to promoting children's participation.

8. Conclusions

Children have the right to participate in all matters affecting them, freely expressing their opinion and having it respected and considered. Young children's participation is key to developing a culture of human rights, democracy, and rule of law. Therefore, young people's active participation and decision-making in society must be protected and encouraged from an early age. Even though children's right to participate is key to education quality, its implementation in early childhood education (ECE) remains a challenge. To support high-quality ECEC through the implementation of children's right to participate, we propose a multilevel professional development approach. At the research level, it seems relevant to bridge the gaps between theory and empirical evidence. Considering multiple perspectives, methods, informants and levels of analysis contributes to a fuller understanding of children's participation in ECEC.

By providing ECEC professionals with learning, reflection, and self-assessment tools to support the implementation of children's right to participate, we aim to contribute to individual and organizational change towards participation, thus increasing the well-being of children and professionals. During the project, we will develop three independent but complementary professional development tools focusing on ECEC staff's knowledge, attitudes, and practices (i.e., competence) regarding children's right to participate: (1) a Massive Open Online Course (MOOC) on children's right to participate in ECE, targeting teachers, assistants, and coordinators/managers; (2) a self-assessment tool designed to support teachers and assistants in delivering high-quality ECE through participatory practices at the classroom level; and (3) a self-assessment tool designed to support coordinators/managers in enhancing participatory practices based on organizational resources and supports.

In addition to designing and implementing the learning, reflection, and self-assessment tools (that correspond to our intellectual outputs), we will conduct an examination of their feasibility by focusing on their acceptability, demand, implementation, practicality, adaptation, integration, expansion, and efficacy (Bowen et al., 2009; Orsmond & Cohn, 2015). The examination of these feasibility dimensions involves gathering input from end users (i.e., ECE teachers, assistants, and coordination/management professionals) and collection of in-depth information (including classroom observations). This is an important phase of iterative development of innovative tools/interventions, providing information on any revisions needed to bring the use of the tools to scale, maximizing their implementation and sustainability. Based on this feasibility analysis, upon project completion we will be able to both share innovative professional development tools and provide information on how to use them in an effective and sustainable manner.

9. Acknowledgement

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Re-thinking the ABC LD workshop at 4EU+ Alliance

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Abstract

We present the result of an effort undertaken within the 4EU+ Alliance where six research universities collaborate on current and future pedagogical implementations, research initiatives and solutions on higher education didactics. The ABC LD workshop, based on the research of Diana Laurillard, serves the Alliance's strategic initiatives.

Our previous experience on running ABC LD workshops allowed us to identify our teachers' needs and adapt them accordingly in order to meet the Alliance's academic development objectives. The outcome reflects our ability to handle deep-thinking initiatives in the form of a terrain workshop and therefore characterizes our endeavour for future adaptability.

Towards this goal, we created and digitised resources related to pedagogy, we designed a pre-ABC training and linked this workshop with the 4EU+ educational framework by creating new materials on identified key terms.
The ABC LD workshop was initially designed for physical face-to face meetings, nevertheless, also due to the Covid crisis, we created an online version, keeping its contemporary structure and practices. Real time engaging data are foreseen to come rolling in the months to come via a qualitative beta-testing period.
It was built on the Moodle platform and we chose a collaborative blackboard tool for running the practical workshop allowing interactivity and collaboration for the teachers. This format enables easy engagement that confers flexibility, a durable access to the pedagogical resources and design tools.
We offer the ABC LD@4EU+ tool as a sustainable and creative activity for a developing academic environment taking into account contemporary and future requirements for 21st century education.

Keywords: 4EU+ Alliance, European University, European Universities Initiative, ABC LD@4EU+, 4EU+ educational framework, course & module design, Innovative pedagogies

1. Introduction

The 4EU+ European University Alliance brings together six comprehensive, research-intensive, public universities from four regions of Europe (Sorbonne University, University of Warsaw, University of Milan, Charles University, University of Heidelberg, University of Copenhagen) to strengthen the European vision of deepened cooperation and mutual enrichment by developing a new quality of cooperation in teaching, education, research and administration, leading to the creation of a truly integrated European University System.

This European University Project (EUP), co-funded by the Erasmus+ Programme, reflects the clear paths that Europeans have been committed to follow for several decades now concerning higher education, academia, university research while still reflecting the European University's adaptability and flexibility towards social partners and the strategic role they incorporate into the project.

Being our Alliance's first and foremost academic ambition, we boast to feature it with notions like open education, data literacy, multilingualism, critical thinking, entrepreneurship and societal engagement.

This article aims to present the result of a common effort undertaken within the 4EU+ Alliance where pedagogy experts from the partner universities collaborate on preparing adequate implementations that serve the Alliance's strategic initiatives. The ABC Learning Design (ABC LD) workshop has been identified as an initial solution we can rely on (Laurillard, 2012). We created and digitised resources related to pedagogy, we redesigned the ABC LD workshop, we added a pre-ABC training and adapted this workshop to the needs of the 4EU+ educational framework by creating new materials on identified key terms. Following the first beta-test, we have obtained qualitative feedback and comments from participants.

In the following pages a thorough walkthrough of the tool will be presented. The reader is able to apprehend the basic notions and initiatives behind the creation phase, interacting in the sense of the meaning that the editing team was willing to introduce. The article can be addressed as a guide to a, before mentioned, living experience, that can serve both academic demands and day-to-day faculty objectives and otherwise activities. The importance should be attributed, once again, to the versatile character of the tool and, thus, of the article.

2. Immediate tasks presentation issued from 4EU+ educational strategy

2.1 Task working group objectives

The main objective of the digital teaching and academic support task working group, fulfilled in 2020, was to create a catalogue of innovative activities and tools to support the professional development of academic teachers. In synergy with other working groups and work packages within the European Universities Project, it was decided to focus on providing professional academic support and to prepare a 4EU+ offer of workshops in order to foster better educational cooperation by working together across national borders and cultural and linguistic communities. According to the "4EU+ Mission Statement" (February 2019) even if all the allied universities share similar characteristics and play comparable roles in each of their countries, several differences can be noticed such as student administration procedures, student mobility, lifelong learning, entrepreneurship initiatives, digitalisation, etc. It reflects the structural inequalities of European higher education and the need to ensure a better balance. Thus, one of the key objectives of the Alliance is to improve the quality and efficiency of education and training. Research-based education is a fundamental component of this process with a blended learning approach in mind. In line with this, working groups have been created focusing on delivering key objectives and the academic development task working group was one of them.

The academic support task working group, composed of specialists from all six universities, dedicated its work on delivering two workshops – 4EU+ localisation of Activity Based Curriculum Learning Design (ABC LD), as we renamed it, and 4EU+ Research-based Learning online self-study workshop (this workshop was designed for university teachers of all disciplines, instructional designers and educational developers, it includes theoretical input phases and practical tasks that secure the transfer to specific approaches by different disciplines and diverse academic cultures).

2.2 Gaps & needs analysis

As a starting point, the data on existing trainings for academic teachers and staff at the six allied universities have been collected via a survey. The outcomes have been put together in the form of a structured catalogue for mapping competence building activities throughout 4EU+ partner universities, joined by an overview of the training offer addressed to our academic staff. Our findings have served for gaps & needs analysis in order to find out which competencies are the key ones for innovative pedagogy and what topics should be included in the academic training.

The analysis of the data collected in the survey and the catalogue revealed that the training offer is focused on and well covers the area of tools adapted to the infrastructure of individual universities of the Alliance. However, in reference to the methodological part (instructional design, educational science, etc) the offers were not equal for all partner universities. We concluded that the undertaken activities should focus on further supporting online teaching and learning. The emphasis should be put not only on the technical skills, but on building pedagogical competencies related to online education, including cultural differences in teaching and learning in the online format.

Therefore, we decided to adapt the Activity Based Curriculum Learning Design (ABC LD) method and toolkit for 4EU+ needs, recognised as the most effective in its potential, aiming to help academic teachers prepare pedagogically coherent module designs online and/or in blended formats.

3. ABC LD training within the 4EU+ education framework

3.1 About the original version of the Arena Blended Connected (ABC)

The original ABC workshop is a hands-on engaging training widely spread and used by several European universities and institutions.

It was developed by Natasha Perovic and Clive Young from University College London and it is based on the pedagogic theory of Professor Diana Laurillard's Conversational Framework. The ABC Workshop, licensed under Creative Commons Attribution-Non Commercial-Share Alike 4.0 International (BY NC SA 4.0.), is a user-friendly and student-centred tool.

The ABC method's main goal is to provide teachers and educational developers with a quick and engaging yet in-depth tool for designing curricula, programmes, modules and MOOCs. It is meant to support teachers' skills and integrate teaching teams around shared educational goals. The method is taught via interactive workshops. It allows the participants to design or redesign their module/course/curriculum by creating a visual storyboard. Using this format, teams work together to outline the sequence of learning activities required. It includes both on-line and in-class student activities.

Consequently, the ABC Learning Design workshop (as renamed later by UCL) has been identified as most demanded for all the six allied universities as it meets expectations and needs for designing curricula, courses or modules in a rapid, activity-centred and user friendly manner. Nevertheless, it became obvious for us that we needed to adapt the original version and tailor a localised one that can answer the 4EU+ Alliance needs and key terms. Because of its adaptability, other institutions have similarly brought their own localisations and adaptations (Hasenknopf et. al. , 2019).

To better express the localisations we have chosen for this training within 4EU+, it is important to indicate the elements composing the original toolkit as developed by UCL.

It includes:

- a tweet and shape sheet
- a storyboard
- two-sided cards representing 6 learning activities types with a definition on the front of the card and examples of activities on the back (activities proposed in a "classical way" or by using "digital means")
- an additional online activities sheet
- an action plan
- an appwheel document presenting the different tools that can be used to implement digitally different types of activities

In the original version, ABC was conducted in a face-to-face mode. On a large table, at an in-class setting and during 2 hours, each working group of participants has at his disposal all the elements of the toolkit and uses it for designing or redesigning a module supported by the guidance of the workshop facilitator. Participants worked on refining their course idea. On a big A1 sheet storyboard, the small coloured cards indicating the different types of activities were moved and removed as participants could add manuscript notes.

For more efficient collaborative work, it is recommended to create working groups consisting of teachers, researchers, instructional designers, other professionals and students, but it is essential that at least one of them will be running a real course that may serve as a case study for the workshop purposes.

Our proper experience allows us to underline that for better results and an in-depth design or redesign of a course or module. It is recommended to have members of the team involved in its teaching. It is an important motivational factor for the teaching staff working on their own projects and teachings and guarantees real implication and consensual results that will be concretely implemented.

The method is based on six learning types of activities: Acquisition, Collaboration, Discussion, Investigation, Practice, and Production. Their pertinent association for serving the intended learning outcomes of each module or curricula allows the creation of teaching patterns that enhance a student oriented and research based teaching and learning.

3.2 The 4EU+ localisation of the ABC LD workshop

During our team work for the 4EU+ Alliance, we identified several adaptations and additions needed to be brought to the original version for better serving the educational strategy of our Alliance and the vision of the European University Project. A few of these localised elements and add-ons were already tested in 4EU+ partner universities and had proved their pertinence.

One of the first adaptation challenges we faced was the cultural and language aspect which, although partially set aside as this training will serve a common education strategy and purpose, was an essential point to take into account when designing this ABC LD@4EU+ training.

The chosen language for the joint workshops will be English as well as the courses' language, nevertheless, local translations are available as well as specialised facilitators and pedagogy experts.

The defined learning outcomes of ABC LD@4EU+ training

The pedagogical design, the content, and the feedback were prepared according to the learning outcomes that were inspired by the revised Bloom's taxonomy (Anderson et al., 2001). The participants of the ABC LD for 4EU+ course should be able to:

- Draft the storyboard of the programme, course, or module by mixing, sequencing and stacking cards with the six learning types [*Define and use the six "learning types", namely: Acquisition, Investigation, Collaboration, Discussion, Practice, Production & select both conventional methods and digital technologies suitable for each of the learning types necessary for achieving the learning goals of the course or module*.]
- Define the types of assessments suitable for your course or module, thus matching its learning outcomes and the corresponding learning types.
- Visualize and later on revise the proportions between the learning types in course or module.
- Design collaboratively (ask for and receive feedback) the learning experience of new programmes and modules or when reviewing current programmes
- Prepare the action plan assigning the tasks, responsibilities, and deadlines to individual teachers taking part in designing and preparing the course or module.
- Revise and re-evaluate the curriculum of your programme or module anytime when necessary.

New structure for the ABC LD@4EU+ training

As 4EU+ is an alliance of 6 European universities, we felt it was necessary to create a digital version of the tool and to design an online training that could be followed by participants from all partner members. Since one of the main aims is the creation of a jointed training offer, it was essential to provide solutions that allow the teaching teams to work collaboratively and join their efforts for creating the new joined courses or modules.

At the same time, the worldwide sanitary crisis in 2020 imposed on us the conception of all pedagogical activities in an online format. This constraint became, nevertheless, a strength as we succeeded to find digital tools flexible and adaptable that let us design the practical part of the workshop in a digital format.

Another point we worked on is the structure of the workshop itself for enhancing the Alliance's needs and strategy. While the ABC LD workshop is concentrating on a direct practical application with the use of cards, we opted for adding some pedagogical inputs before the practical part of the training.

Several facilitators having already worked with ABC, identified the need of a pre-workshop that prepares the teaching staff participating in the training. It was important for us to present not only an overview of 4EU+ education strategy but give the necessary tools and inputs to the participants and create a joint and common language and knowledge on pedagogy.

We explicit the definition of several main pedagogical notions and principles such as constructive alignment, summative and formative evaluation or intended learning outcomes and gave concrete application examples as you can see previously. We also introduced, in a flipped classroom model, Diana Laurillard's Conversational Framework and the presentation of the six learning activities among other elements (see figure 1).

These points were taken in account while designing the course on a Moodle platform where the resources were grouped into 6 main modules:

- Introduction: information on the 4EU+ Alliance, overall instruction on how to work during the training, pre-workshop questionnaire for the participants and a Q&A forum;
- About the ABC LD training: a video introducing the ABC LD method, description and general information about the training, its learning outcomes and pedagogical design;
- ABC initiation: explanation of the importance of coherence in course design, video on 4 main guiding principles of the ABC LD method, glossary of terms useful in pedagogy with a "match terms with definitions" exercise, presentation of Diana Laurillard's learning activities concept and 6 learning types description, digital version of the 4EU+ Education Framework cards, video on about ABC LD tools and how to use them;
- ABC practice workshop: information about the ABC practice workshop, step by step description with time estimates and detailed instructions, ABC LD appwheel - an infographic about proposed digital tools;
- References to useful terms in pedagogy;
- Evaluation

Today the localized version of 4EU+ workshop's workflow includes synchronous online moments and asynchronous autonomous work from the participants. We launch the training with an online synchronous meeting for making explicit the expectations and ways of working during this training. Participants are invited to continue autonomously on Moodle and to discover the resources we prepared and do some practical training about the pedagogical notions and definitions we prepared. Facilitators are present and available online through the forum. At the end of this first part we propose a second online meeting for answering any questions and discussing the notions and elements seen until then before recalling the elements needed to be prepared from the groups before the practical part of the training. During the workshop itself, participants work collaboratively on the design of their teachings using the ABC cards. At the end of the workshop, we invite them to use the available tools for finalising the design of their course or module. Afterwards, we

propose a new synchronous moment for discussing and linking the new pedagogical design with the educational framework of the 4EU+ Alliance.

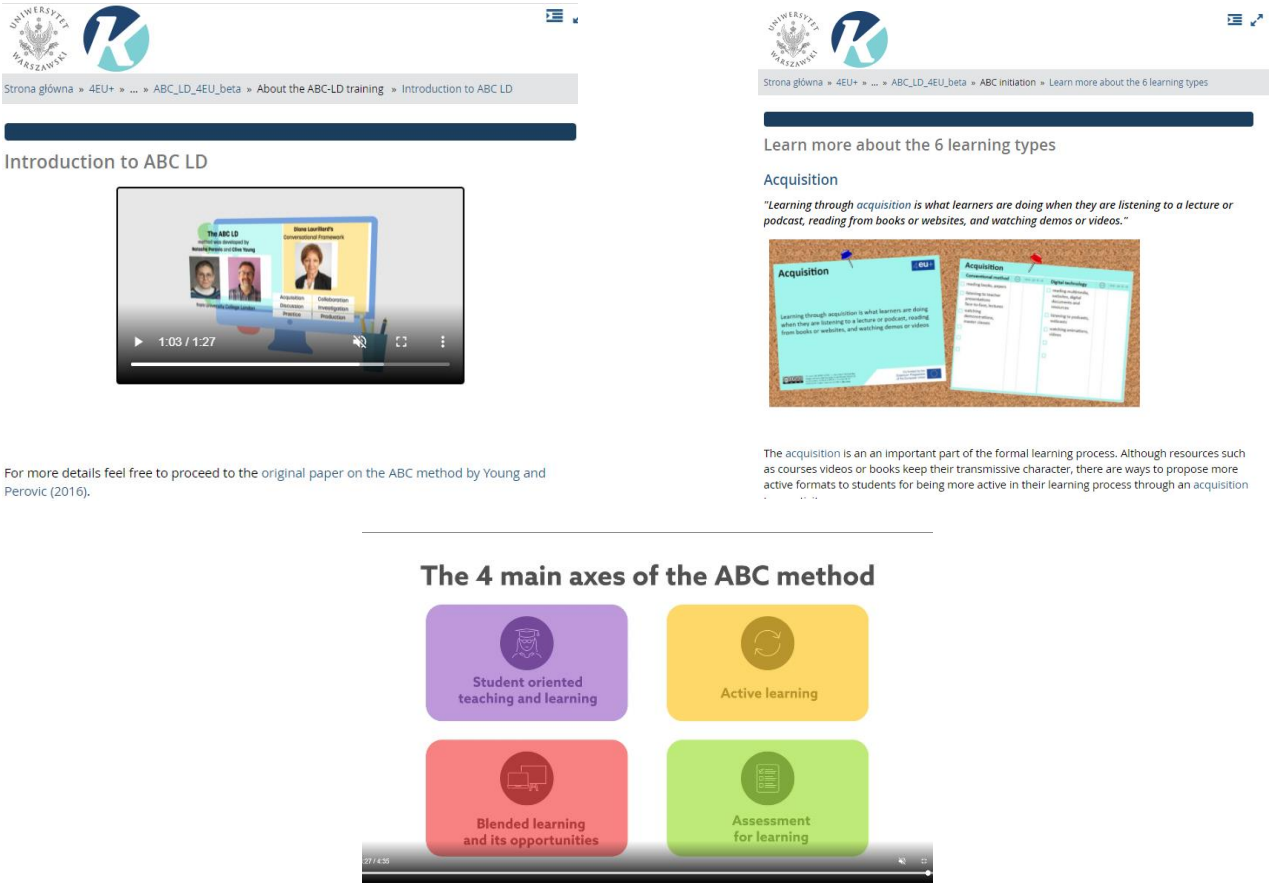

Figure 1 The layout of the self-paced ABC LD e-course with all the necessary materials and instructions, with animated videos and textual resources

3.2 **Additions to the ABC LD@4EU+ training**

In order to facilitate the design of online and blended courses, we added on the back of the 6 learning activities cards the notions of synchronicity and asynchronicity giving the possibility to the teaching team to fine-tune the articulation and modalities of the learning activities they wish to propose to their students.

We also considered that the notion of the “necessary working time” for students to cope and finalise the pedagogical activities put in place by the teaching team, an element already added on the version of the workshop running at Sorbonne University, was important to integrate. By taking in account this element, we can design courses and modules in line with their equivalents in terms of ECTS, giving a clear view to the designers and students of the expected effort and engagement.

We likewise decided to give the possibility to the teaching team to choose the storyboard layout they wish to use for their design, the original version and a second one facilitating visually the design of blended courses.

The 4EU+ main educational key terms

A new input and major addition was the link of ABC LD with the general educational framework of 4EU+. The 4EU+ partner universities collaboratively developed a general and innovative framework for conceiving teaching within the Alliance and supporting the 4EU+ academics in designing the educational activities in such a way to offer students a transformative learning experience. The 4EU+ innovative education framework thus created is centred around five key pedagogical strategies and approaches that form the minimum standard for 4EU+ education:

- Research and transfer-based education
- Active learning
- Intercultural and inclusive education
- Self-directed learning
- Critical thinking as a meta-competency

These educational strategies trigger the skills and competencies required for the 4EU+ student to deal effectively with the learning process.

To help instructors engage students in ways that foster the intended 4EU+ competencies, the Alliance has developed a repository of good practices and examples that are efficient and well-suited for promoting the kind of thinking and learning worthy of a 4EU+ student.

This repository took the shape of user-friendly, quick-to-consult cards inspired from ABC's learning activities cards (see figure 2), one for each teaching strategy or approach. The front of the card defines the term, while the back of the card presents a non-exhaustive list of examples of different learning approaches and techniques for how to incorporate the 4EU+ values into 4EU+ classrooms, e.g. one-minute paper or fishbowl for fostering active learning or discussing logical fallacies to support critical thinking.
The cards were then prepared in H5P format that allowed for linking inside the document, embedding videos and adding pop-up information with references.

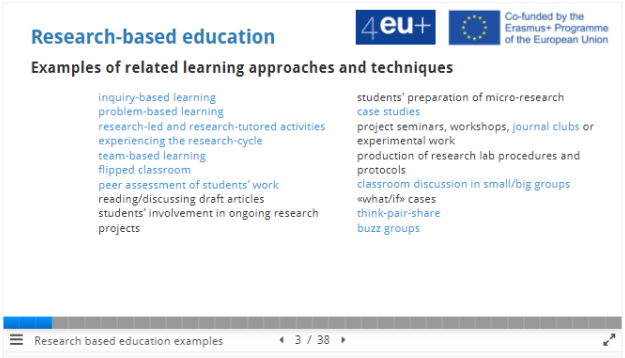

Figure 2. Example cards from the "4EU+ Education Framework - examples of good practices in teaching and learning" digital resource. Additional references for each of the different methods, and (at times) short explanatory videos have been added to the backside of each card.

The participants of the workshop can thus validate the learning activities they designed and link them directly with the key pedagogical strategies of the Alliance.

Fostering a common terminology / Glossary of useful terms in pedagogy

As no previous pedagogical training is expected from the participants, some might benefit from being supported by a glossary, created in Moodle (see figure 3) of important terms occurring throughout the course. We provided such a glossary with definitions and examples of more than 60 terms. The glossary was accompanied with a game puzzlet matching the terms with their definitions and examples. A brief insight into the glossary entries is provided in Table 1.

Table 1. Examples of entries in the glossary of terms useful in pedagogy.

Category of glossary entries	**Examples** (not an exhaustive list)
General pedagogy	Evidence-based teaching; Learning goals; Learning outcomes; Conceptual knowledge and understanding; Constructive alignment; Course syllabus;
Teaching and learning types and strategies	Research-based education; Academic debate; Oxford-style debating; synchronous vs. asynchronous learning; Case studies; Classroom discussion; Flipped classroom; Inquiry-based learning; Jigsaw; Journal club; Problem-based learning; Scaffolding method; Self-directed learning; Spider web model; Webinar;
Collecting feedback	One minute paper; the start/stop/continue technique; Diagnostic assessment; Formative assessment; Classroom observation protocol; Expert blind spot; Logical errors, fallacies, and faulty reasoning;
Testing	Summative assessment; Reliability of a test; Validity of an assessment; Quiz structure analysis; Discrimination index; Facility index; Peer assessment of students' work;
ABC LD related terms	Storyboard; Acquisition; Investigation; Collaboration; Discussion; Practice; Production;

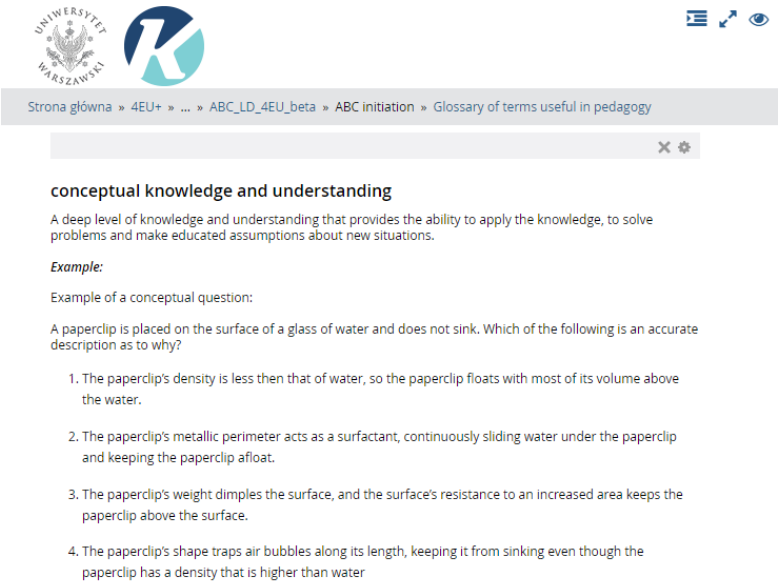

Figure 3. The glossary of useful terms on pedagogy we created in Moodle.

3.3 Online tools and solutions

We have chosen to implement the ABC LD @ 4EU+ training pedagogical design on Moodle as the majority of our universities use this platform. The University of Warsaw Moodle platform has been hosting this training (see figure 4).

Figure 4. The layout of the self-paced ABC LD e-course with all the necessary materials and instructions, which are the basis for running the workshop.

Besides the tools Moodle offers, we used also external tools for enhancing collaboration. After extended testing of available tools (free as well as commercial) we decided to settle with draft.io. Thus, the workshop

itself, its practical part was designed with draft.io. This last one is a commercial solution designed especially for project management and designing workflow but also can be used for collaborative online work. Nevertheless, the possibilities offered allowed us to design an ergonomic and friendly space of work where participants collaborate for designing their teachings by using the ABC cards as well as the 4EU+ key terms cards.

The tool itself is basically an infinite surface where various types of elements can be placed. Users can add text boxes (that can be collapsed to save screen estate), draw basic shapes (lines, arrows, circles), insert images. All changes are being saved automatically and synchronised between logged in users in real time.

The tool enables preparation of the templates therefore we could prepare a database of resources that could be used by participants during a live session (Figure 5).

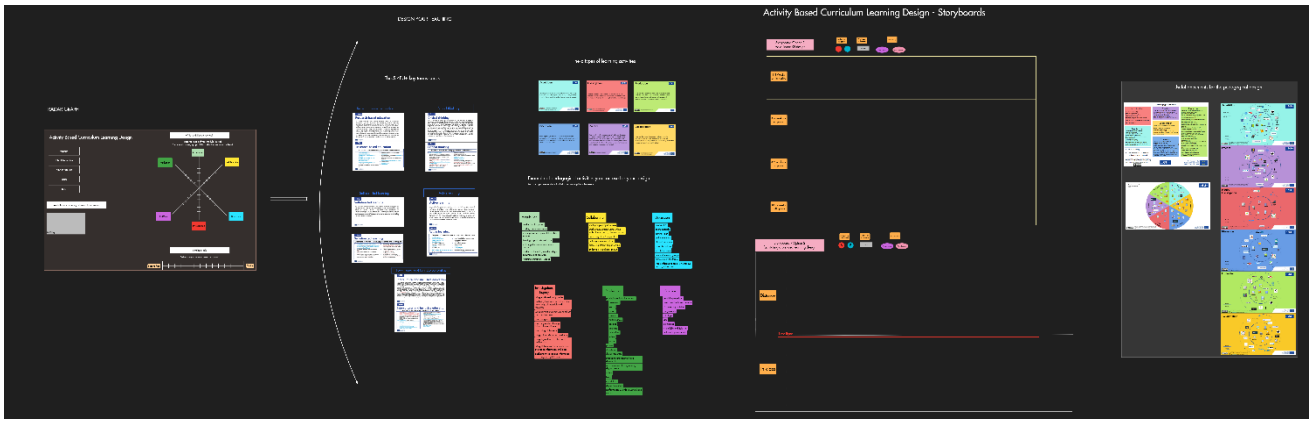

Figure 5. Work surface prepared for the participants in draft.io.

For verbal communication our participants opted for use of Zoom as best known in this environment but any type of software can be used.

3.4 Time investment

Besides this over all digital format, we questioned the time length of the workshop by proposing a more complete training that better answers our needs.

It was clear for us that 2 hours wasn't enough for designing a whole teaching unit, a module or a curriculum. The training we designed envisages a time investment from participants around 8 hours, allowing participants to work in depth aver their teaching.

Within this time frame, we include personal work, synchronous meetings and discussions as well as the practical workshop.

4. Evaluation and first feedbacks

Our project to create joint training about course design for the teaching staff of our universities is an ongoing project that follows a normal iterative cycle. After the analysis, conception and implementation of our first version of this training, we proceeded to a beta-test and evaluation of this proposal. For a more qualitative approach we asked a few volunteer teachers from all six partner universities to follow and experience our training. Eleven (11) participants from all 6 partner universities took part to this first beta-test. We willingly

limited this test in time frame that have been adapted for an evaluative benchmarking at the start of the ABC-LE@4EU+ procedure.

This work is for as an ongoing research project, in a pilot ongoing institution that is 4EU+ Alliance.

4.1 Evaluation questionnaire and qualitative feedback from beta testing

The evaluation questionnaire that was prepared for the course participants can be found in Annex 1. In contrast to the evaluation questionnaire, where we are waiting on the participants' feedback once the course will be launched, we collected extensive feedback from our beta-testers during an overall meeting devoted to this effect. The most important points are summarized in Table 2 in the form of a SWOT analysis.

Table 2. **SWOT analysis of the feedback collected from the beta-testers.**

Strengths (what are the advantages and what was done well)	• The workshop was tiring and required very focused work, but the participants were surprised and pleased that it was actually very effective. • The draft.io collaborative whiteboard was intuitive even to most beginners. • The presence of facilitators in each group was greatly appreciated. They guided the participants and re-energized the groups when there was a tendency to stop working or when the attention turned away.
Weaknesses (what were the testers lacking)	• Downloadable PDF versions of the course cards and booklet should be provided in advance. It is easier to work with the virtual cards when each participant has his/her own printed version on the desk. • A short introductory training on the collaborative virtual platform with a walkthrough of all the required steps should be provided. A more straightforward navigation throughout the course. Some participants felt lost or unsure, what was already done and what remains to be done in the very next step. • More time was needed than expected (8-10 hours instead of the expected 6-8 hours). • Examples of well-designed storyboards should be presented at the beginning to inspire the participants. Also some badly designed storyboards should be presented to avoid common mistakes during the learning design.
Opportunities (how to increase the potential impact of the course)	• Adding more research papers to the references will increase the engagement of teachers with scientific background. • Demonstrating the time costs of the whole learning design would prevent some participants from underestimating the time costs necessary for a fruitful cooperation during the course itself. • Adding a short quiz after each section and part of the course would provide more feedback and self-confidence to the participants before they proceed to the next section. • Putting all the additional content that is not necessary for the course itself to a separate section would make the course clearer.

Threats (what could endanger the successful running of the course)	• A group of participants got stuck in the process without previously clearly formulated learning outcomes. • Some participants without previous experience with collaborative virtual whiteboard platforms were struggling with the workflow and therefore not focusing on the course merit. • More members of each team should be made co-hosts of the virtual meeting to be able to solve unexpected technical problems with breakout rooms, sharing content etc. However, only one person in each group should share the screen and moderate the session to prevent confusion.

4.2 Contributions of the newly adopted online form of the ABC course

Both the face-to-face course as well as the online course have the same idea, strategy, and content. However, the comparison of these two forms is summarized in Table 3.

Table 3. Pros and cons of running a face-to-face vs. an online ABC course

Viewpoint	Face-to face ABC course	Online ABC course
Requirements	Requires previous formulation of learning outcomes of the course.	Additionally, a preliminary training in mastering the online collaborative tools might be required.
Social aspect	Makes more fun to the participants and provides a lively working atmosphere spontaneously.	Needs more effort to keep and revive the connections among the participants and to maintain their working engagement. In the self-paced part, the participants can choose their own tempo.
For the facilitators	One facilitator can easily handle more working groups. More groups can benefit from discussing the same points when working in the same room.	Each online room requires its own facilitator. Communication between the virtual breakout rooms is not feasible and they work as isolated groups.
Financial aspects	Requires physical meeting of the participants (travel costs if applicable) and printing of the materials (storyboards, cards).	Can occur even when travelling is restricted. All the working materials can be easily stored, shared and edited among the participants from various Universities. No travelling costs are required.

5. Conclusions

We have prepared and tested an online course for designing courses for teachers from six European universities. Our first experience showed that those teachers who wanted to get connected with their

colleagues to build up courses for international students were feeling safe to learn from each other within the course, they could catch up with the ABC learning design method and provided feedback on how to facilitate this unprecedented and ongoing work.

The development and manipulation of the various and autonomous aspects of the ABC LD workshop have and will permit in the near future the sustainable development and the comprehensive procurement of the elements necessary in the EUP framework. Our ambition to train the trainers in the ABC LD method will be working in parallel with our scope and goal to produce, share and evaluate pertinent and up to date courses for our Alliance, courses into which students and our teaching staff can find the will and ability to engage in future education.

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7. Annex

Annex 1. Evaluation questionnaire

No replies were recorded so far, therefore we present just the structure of the questionnaire:

1. At my University I am a part of: Teaching staff / Organisation?
2. How much time did it take you to finish the course, including all assignments and assessments?
3. Was the duration of the training appropriate for the content?
4. Were training objectives clearly stated before you started the course?
5. Did you find the workshop content useful? (1 - not useful at all, 5 - very useful)
6. Was the material presented in an interesting way?
7. Was the language easy to understand?
8. Please rate the following statements (1 - strongly disagree, 5 - strongly agree)
    - The training will allow me to be more efficient in your teaching profession, especially in designing my courses
    - The training made me want to know more about pedagogy (principles and practices)
    - The training led me to consider collaborative thinking about teaching in my department or university
    - The training will allow me to be more efficient in your teaching profession, especially in designing my courses
    - The training made me want to know more about pedagogy (principles and practices)
9. The training led me to consider collaborative thinking about teaching in my department or university
10. Are there elements of the training that you are willing to implement in your work? Which ones?
11. What is your overall assessment of the training? (1 - very poor, 5 - excellent)
12. How likely would you recommend this training to a colleague? (1 - definitely not, 5 - definitely)

Annex 2. Draft.io detailed view

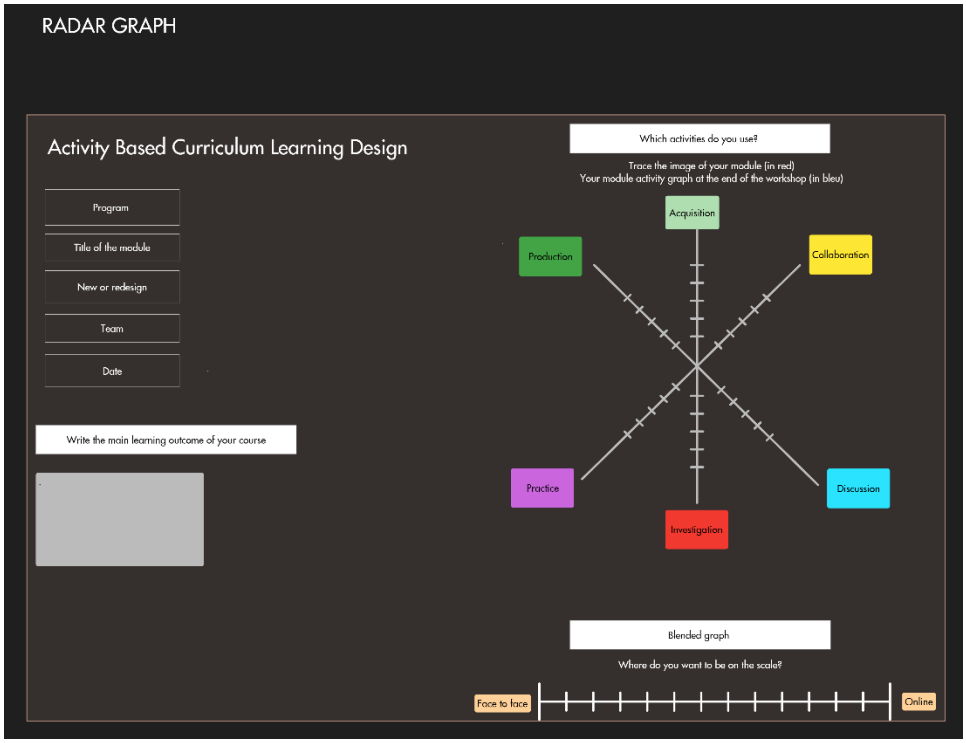

Figure 6 : the Radar graph as designed on draft.io

Figure 6 : The 4eu+ key terms cards as they appear on draft.io

Figure 7: Activity cards, backside options and pedagogical activities examples as designed on draft.io

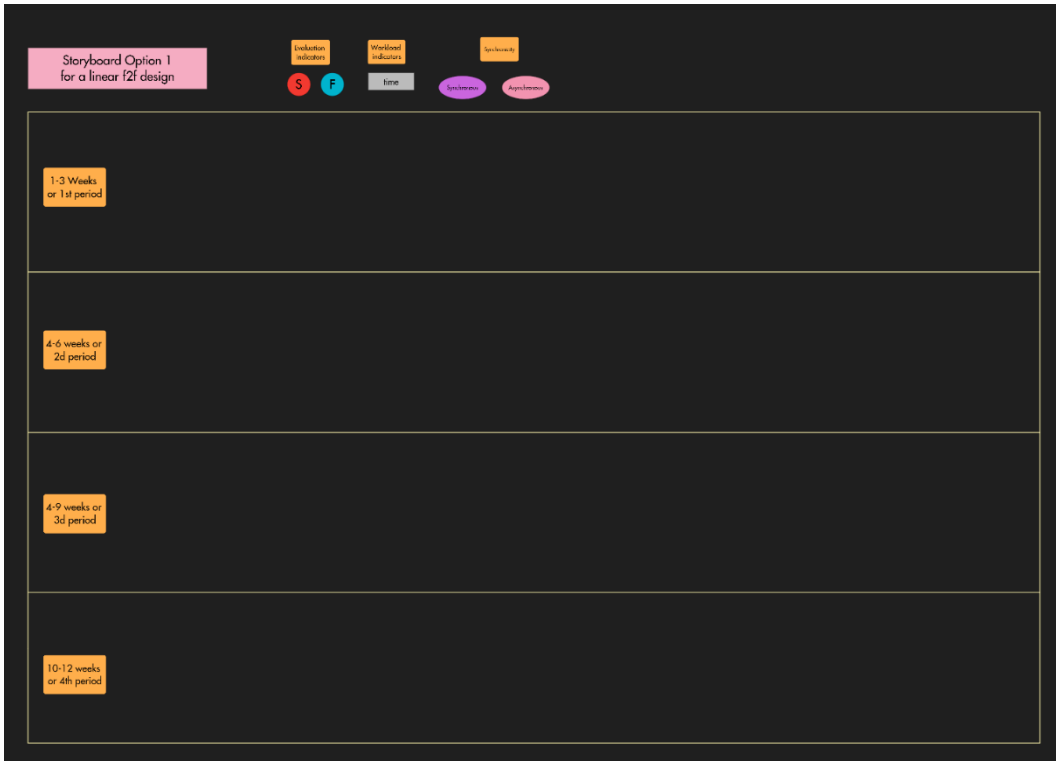

Figure 8: First storyboard layout option designed on draft. This representation is based on the ABC' original design

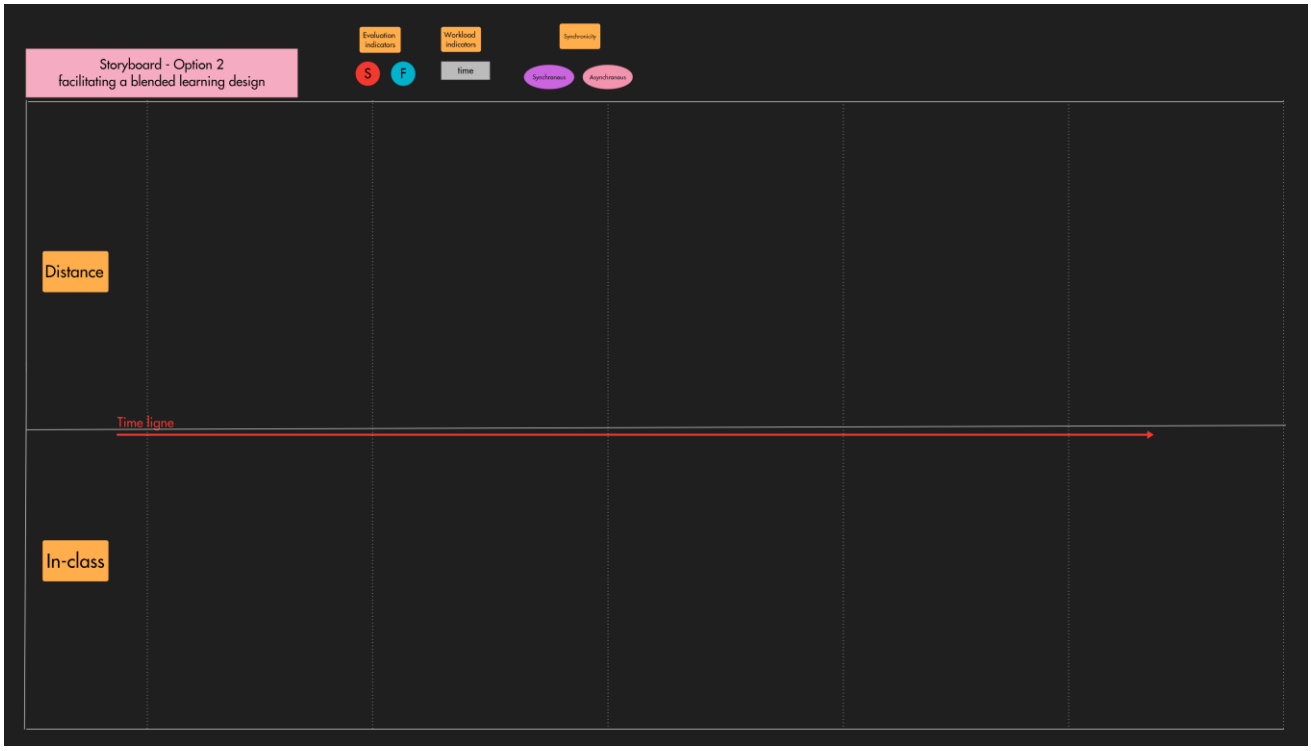

Figure 9: Second storyboard layout option designed on draft. This representation is done for facilitating the design of blended courses by allowing the separation between in-class and distance activities

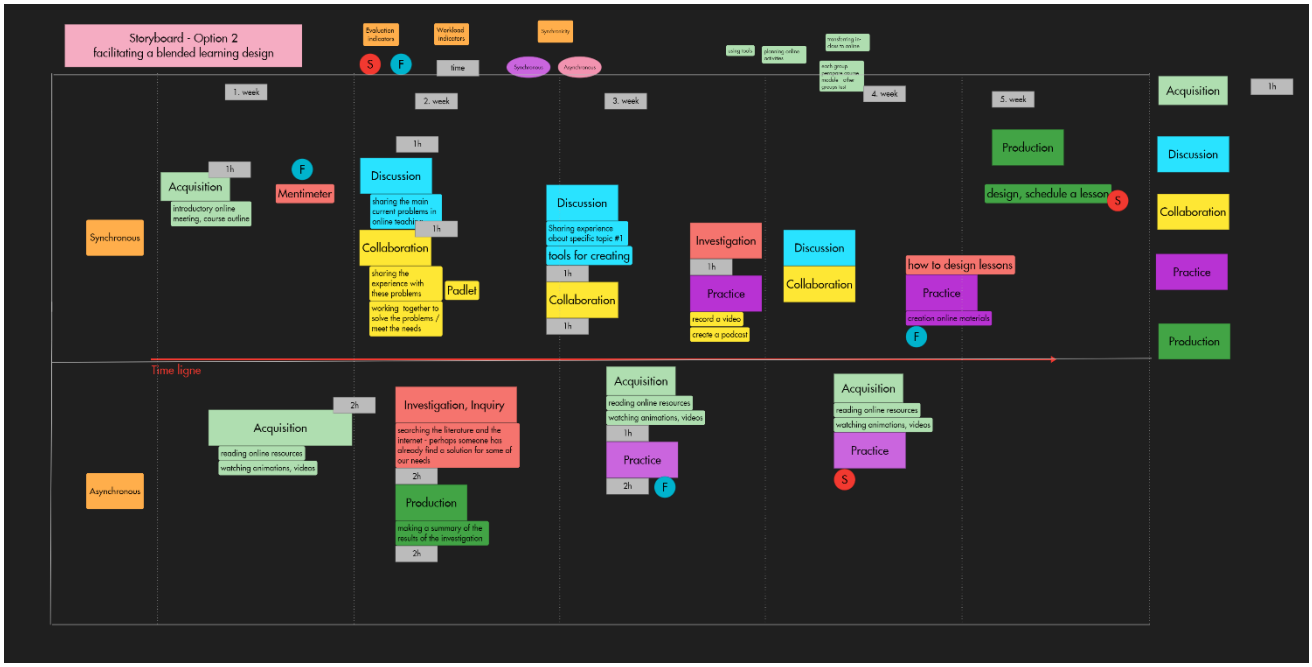

Figure 10: An example of a course design

Teachers´ experiences of success in remote learning

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Abstract

Finnish universities of applied sciences have been co-developing online learning for years. This is the reason why we wanted to work together to ascertain the experiences of teachers in remote teaching. An online questionnaire was directed at all universities of applied sciences (n=22). There were 1531 responses, which is about 31% of the teaching staff of the universities of applied sciences.

In this presentation we examine how prior experience with online teaching and the field of education related with teachers' experiences of pedagogical success. What kinds of teaching practices work, and which ones not? Connections between the variables were examined using statistical analysis, and the answers to open questions were analysed through content analysis.

The results show that collaborative work helps teachers to cope. The key sources of support were colleagues. Tips and experiences were shared with others regardless of previous experiences of online teaching.
All respondents felt that they had received new working methods. On the other hand, teachers with little or no prior online teaching experience felt that they had received the greatest amount of new online tools.

The teachers experienced that the most functional pedagogical practices were the various webinars, group working, online guidance and feedback. Instead, spontaneous communication, interaction, student involvement and activation and sense of community did not work as well. Prior experience in online teaching helped teachers to adapt and they felt that they had succeeded better in remote teaching. The special features of different educational fields were also reflected in remote teaching during the COVID-19 pandemic.

Keywords: higher education, Covid-19, remote learning, remote teaching

1. Introduction

The global COVID-19 pandemic has challenged higher education in many different ways. The ability of higher education institutions to provide teaching, the experiences teachers and students have had of remote work and the growing need for support services have been hot topics in the higher education community. Experiences during the pandemic have created new expectations for the future and a need to develop various forms of flexible teaching, guidance and learning. This is why it is important to examine teachers' experiences of success in a situation that has required rapid changes in the everyday routines of teaching.

Online teaching and teachers' pedagogical digital competence have been undergoing development for years, both in individual Finnish universities of applied sciences and in cooperation between higher education institutions. At the start of the pandemic in spring 2020, their digital skills were nevertheless put to the test as higher education institutions suddenly shifted to remote teaching and learning. As the digital leap was massive and collective, universities of applied sciences felt it necessary to work together on examining teachers' experiences of remote teaching during the exceptional situation caused by the COVID-19 epidemic. It was felt that the results would benefit the development of digitalised teaching at individual universities of applied sciences, cooperation between higher education institutions and the preparation of the national Digivision 2030 program (Digivision 2030) alike.

The key factors in the success of the digital transformation were considered to be the organisation's experience in online teaching, the network connections and equipment in use, online teaching software as well as skills in its use, pedagogy and the fact that not all fields are equally well suited for online teaching, and the accessibility of various support services and issues related to well-being, equity and equality (Cesco et al. 2021).

2. Experiences of remote teaching during the COVID-19 pandemic in universities of applied sciences

In recent years, Finnish universities of applied sciences have collaborated on developing a digital course portal (Campusonline.fi/en) that brings together online courses from all 24 universities of applied sciences in Finland. At the same time, common quality criteria for online implementations have been drawn up, online implementations have been developed in cooperation and teachers' pedagogical digital competence has been expanded. As such, the digitalisation of teaching is familiar to universities of applied sciences, and for years, different forms of blended and online implementations have been available alongside ordinary degree programmes.

However, teachers' skills in and previous experience of online teaching are varied, and many teachers were unfamiliar with hybrid models of teaching as well as the need to deliver all teaching remotely during the pandemic. As has been noted in various contexts, teaching remotely during a pandemic is very different from participating in a well-planned and high-quality online or blended implementation.

According to a report by the Trade Union of Education in Finland (OAJ 2020), Finnish teachers of applied sciences have felt that their competence was sufficient, and most of them were familiar with the online tools used. While students have also mainly been satisfied with their teachers' competence, they have felt that some teachers' skills are inadequate. Students have mainly also been satisfied with their personal capabilities for e-learning, and only one fifth felt that their capabilities were somewhat insufficient or insufficient (SAMOK 2021).

As a rule, the network connections used by Finnish universities of applied sciences and their teachers and students worked well even during a pandemic. Higher education institutions were already using various tools that enabled remote teaching, such as learning platforms (e.g. Moodle) and tools that enabled real-time online

work (e.g. Zoom, Microsoft Teams, Collaborate). Our study found that almost 90% of teachers were at least fairly satisfied with the functionality of the tools offered by universities of applied sciences in remote teaching. In addition, universities of applied sciences offered various enhanced support services for online teaching during the pandemic (Laitinen-Väänänen et al. 2021).

Students felt that Finnish universities of applied sciences mainly coped well with the state of emergency (FINEEC 2021; Akava 2020; SAMOK 2020 and 2021). However, students had varying personal experiences of shifting to remote learning. Students felt that remote learning brought more flexibility to their studies and facilitated the reconciliation of studies and other life. However, they found that interaction, guidance, study motivation and well-being were affected negatively. This experience seems to have been affected by the student's stage of studies, study mode (full-time, blended or online study) before the transition to remote learning, their life situation and their capability of studying online. Research has also emphasised the importance of study motivation, e-learning skills and self-direction for the smooth running of studies (FINEEC 2021; Ruhalahti et al. 2021).

In this article, we will look at the successes experienced in remote teaching by university of applied sciences teachers during the COVID-19 pandemic and examine which types of pedagogical solutions were effective and which did not work as hoped. We will also examine how the teachers' previous online teaching experience and field of education are linked to their experiences of success.

3. Data and methods

The target group of the study was the teaching staff of universities of applied sciences (n=22) in Finland. The survey was carried out online in May 2020. Each university of applied sciences was responsible for distributing it to its own teaching staff. Responding to the survey was voluntary. A total of 1,561 responses were received, which is about 31% of the total teaching staff of the universities of applied sciences (Vipunen 2020). The respondents represented all universities of applied sciences and different fields of education.

When preparing the questionnaire, both national and international surveys and reports related to experiences during the COVID-19 pandemic were used (OAJ 2020; SAMOK 2020; Watermeyer et al. 2020). The research team drafted a questionnaire that was sent to the universities of applied sciences for comments. Taking the comments into account, the team prepared a final questionnaire. The questionnaire contained both structured and open-ended questions.

For quantitative data, the linkages between the variables were examined using the chi-squared test and the differences between the groups with the Kruskal-Wallis test. Qualitative data were analysed using inductive content analysis (Schreier 2012). The analysis was carried out collaboratively by a team of researchers.

Teachers were asked what share of their teaching was implemented online in 2019. Based on the responses, three groups were formed to describe the teacher's online teaching experience (Table 1). Little or no previous online teaching experience (n=503), less than 30% of the teacher's instruction. Some previous online teaching experience (n=413), 30-49% of the teacher's instruction. A lot of previous online teaching experience (n=503), more than 50% of the teacher's instruction.

Table 1: Teachers' prior online teaching experience by field of education

Field of education	Prior online teaching experience			All N
	Little online (0-29%)	Some online (30-49%)	Much online (50 -100%)	
Information and communication technologies	28 %	29 %	43 %	75
Engineering, manufacturing and construction	47 %	25 %	28 %	307
Health and welfare, social sciences	35 %	34 %	31 %	423
Services	40 %	31 %	29 %	58
Business, administration and law	27 %	27 %	46 %	294
Agriculture, forestry and natural sciences	32 %	36 %	32 %	47
Humanities, education and arts	34 %	27 %	38 %	204
Total	**36 %**	**29 %**	**35 %**	**1408**
Chi-square = 44.121, df = 12; p < 0,001 (Missing value 153, N=1561)				

4. Results

4.1 **Teachers coped with the help of their colleagues and the support services**

The results show that collaboration and peer-support help teachers cope. Colleagues and the services and support provided by the teacher's higher education institution were the most central source of support when shifting to remote teaching: personal support provided by the e-learning support personnel, IT support services, support from the supervisor as well as online meetings and instruction sites (Figure 1).

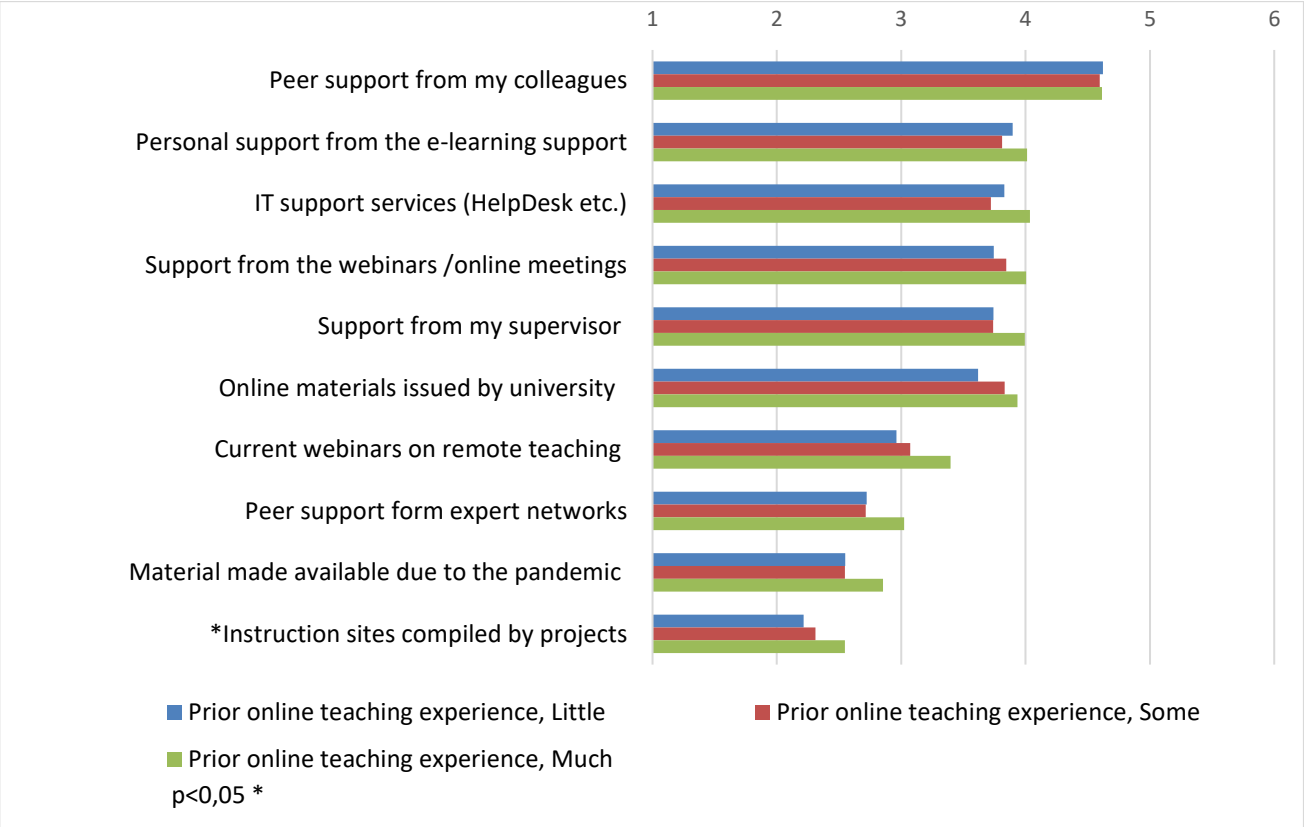

Figure 1: Support during the COVID-19 pandemic (1= not at all, 6= very good)

Regardless of how much online teaching experience the teacher had, in the rapidly emerging situation they sought support primarily from their colleagues and higher education institution. Those who had a lot of online teaching experience utilised services provided outside the higher education institution more than other groups. Those who had a lot of online teaching experience also thought more often than other groups that, rather than the exceptional situation changing anything, online teaching was familiar to them and teaching continued as before.

4.2 **New online teaching practices and tools**

Collegiality was also reflected in the fact that tips and experiences were shared with colleagues regardless of previous online teaching experience (Figure 2) or field of education. The group that felt they had gained the largest number of new tools was those with little or no online teaching experience. For those who had taught online before, the tools were familiar and already in use, while those who had little experience took them up them during the pandemic. On the other hand, every teacher felt they had gained some new online teaching practices; in this respect, there was no difference between the groups.

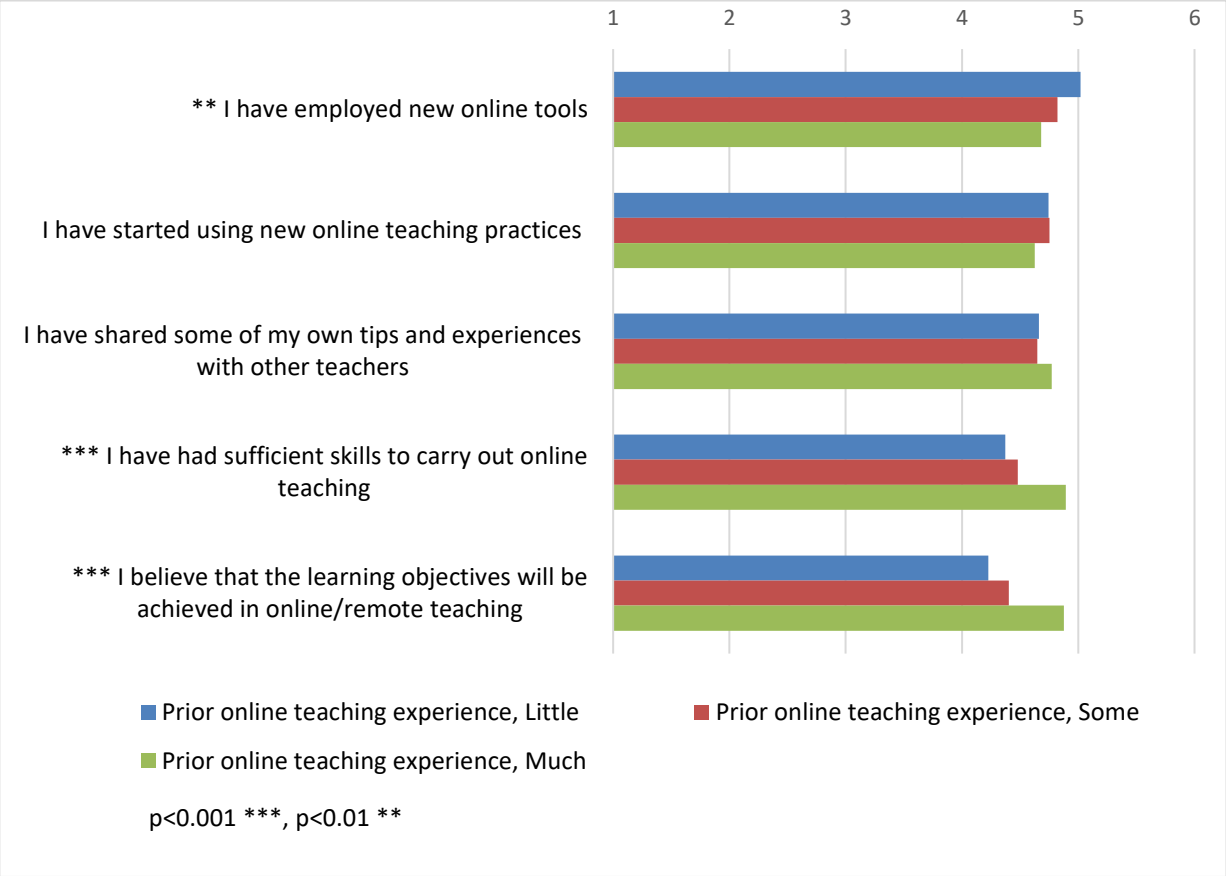

Figure 2: New online tools, teaching practices and competence (1= completely disagree, 6= completely agree)

Those with a large amount of previous online teaching experience also believed in their own competence and the possibility of achieving the learning outcomes online more often than others. Similarly, teachers in the ICT sector, business and administration as well as education and culture had more confidence in their and their students' adequate skills in remote teaching and studying than teachers in other fields.

4.3 **Effective pedagogical practices**

In their open responses, teachers reported that the most effective pedagogical solutions had been various practically oriented webinars, working in small groups using different tools, and both real-time and asynchronous online guidance and feedback. In addition, teachers reported on online teaching practices they found effective, learning design and their insights into new implementation methods. The practices that were most often reported as not working were interaction and spontaneous communication with students as well as student engagement, activation and communality.

4.4 **Previous online teaching experience helped teachers cope**

Teachers with a large amount of online teaching experience rated their success in all teaching activities higher than other groups (Figure 3). The areas of online teaching in which teachers felt they were the most successful were scheduling the online teaching and learning, online lectures and webinars, real-time guidance, preparing assignments as well as assessing and producing online learning material.

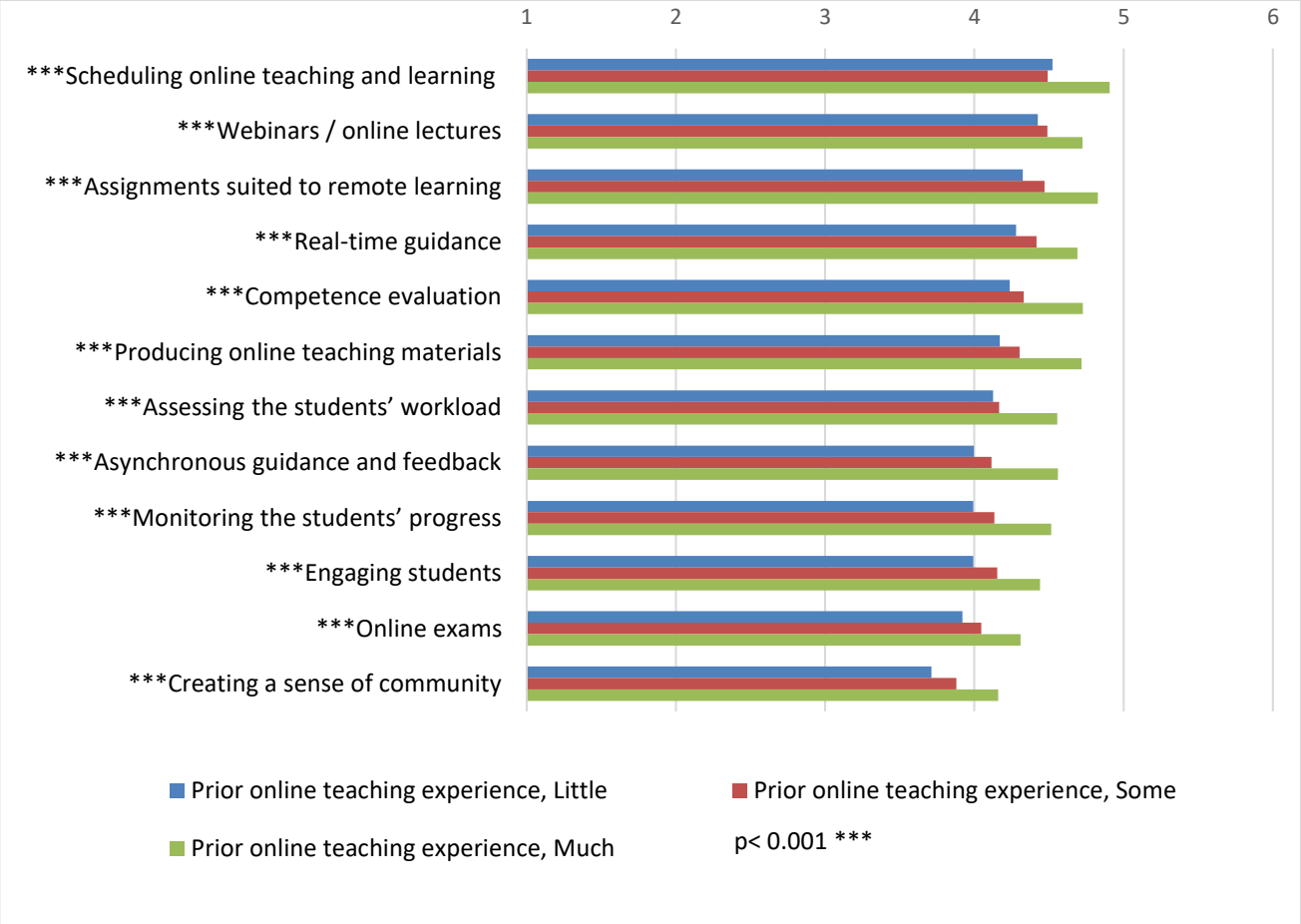

Figure 3: Success in teaching activities (1= not at all, 6= very good)

Creating a sense of community in teaching and guidance situations as well as online examinations were considered the most challenging aspect of online teaching, even though experienced online teachers estimated that on average, they had also succeeded fairly well in these situations. In addition, those who had previously taught less online felt that they had not succeeded very well in engaging the students and monitoring their progress.

4.5 **Differences between fields of education**

The amount of e-learning included in a degree varies by field. Of the teachers who responded to the survey, business and ICT teachers had the most previous online teaching experience and engineering teachers the least (Table 1). The chi-square test shows that the differences between fields of education are statistically significant (chi-square = 44.121, df =12; p<0,001).

The differences between fields of education were also significant in terms of the success of all teaching activities (Figure 4). In general, teachers in the ICT field, business and administration as well as education and culture felt they were the most successful and the teachers in technology and services the least successful. In the areas of student guidance, monitoring the students' progress and student engagement as well as creating a sense of community, teachers in education and culture felt they were the most and engineering teachers the least successful. In the areas of scheduling teaching and learning online, webinars, online learning materials and learning assignments, the highest level of success was experienced by ICT teachers.

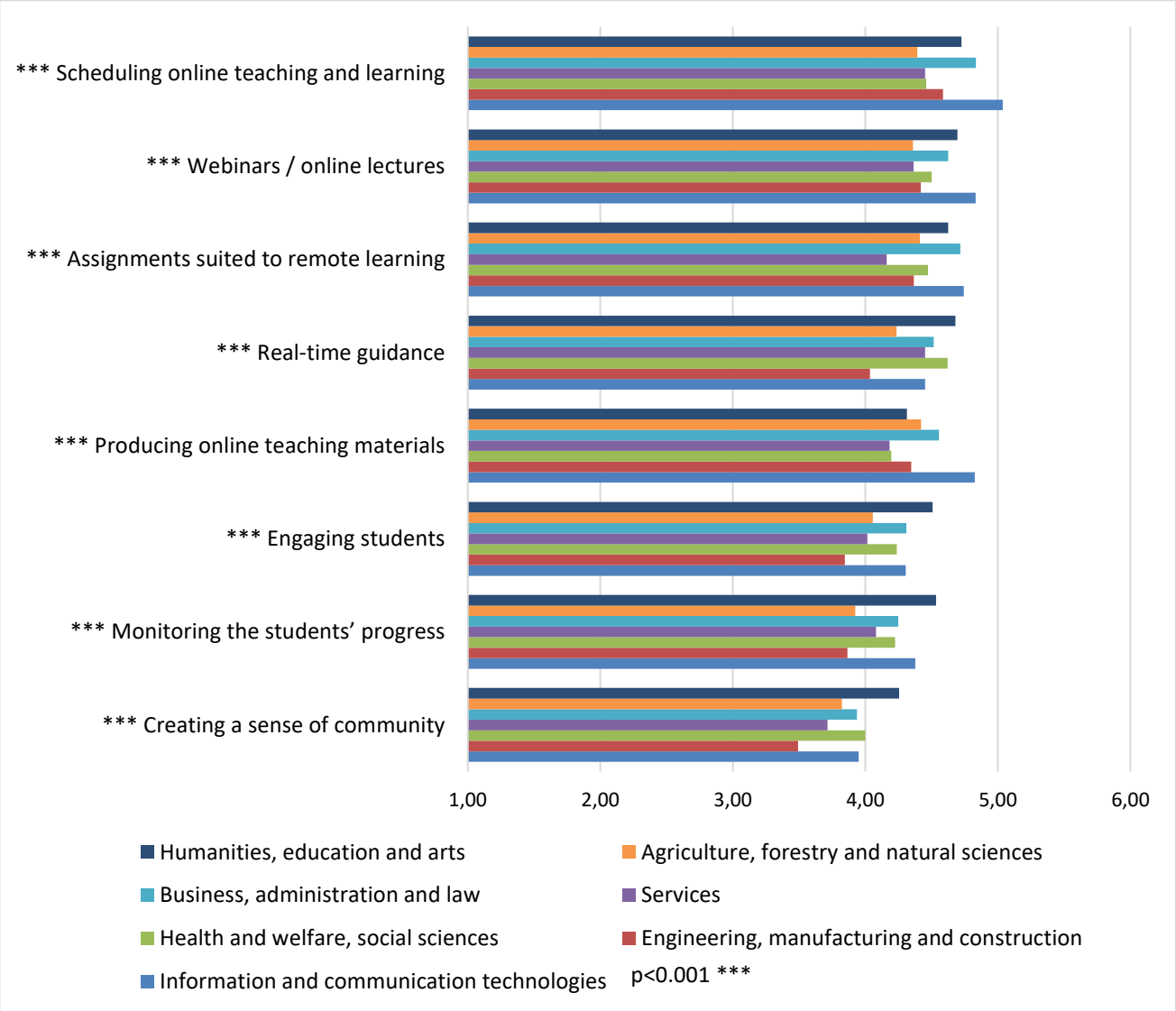

Figure 4: Success in teaching activities by field of study (1= not at all, 6= very good)

5. Conclusions

Universities of applied sciences in Finland reacted quickly to COVID-19, and teachers received support from their institutions in many different ways. Collegiality and previous experience of e-learning helped teachers cope. Open responses also highlighted the fact that previous collaborative projects have created collegial networks and developed competence and preparedness to transfer teaching online.

The preparedness to transfer teaching online was higher in some fields than others. Field-specific pedagogical working methods were also reflected in experiences of success. During the pandemic, teachers creatively employed different solutions for practical exercises, and those solutions should be further developed. In order to develop the digitalisation of teaching, it is consequently necessary to also come up with sector-specific solutions and effective pedagogical working methods to support the achievement of field-specific learning outcomes.

Teachers had employed new online tools and developed working methods for online teaching. Experiences of success were mainly fairly common. However, remote teaching during the pandemic has strengthened the need for developing a collaborative and active learning culture and for a learning design which will in the future enable different ways for students to participate in education.

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OER Competences Framework & self-assessment Questionnaire for "Digi-Teachers"

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Abstract

There is no doubt that the covid-19 has dramatically disrupted all education systems. According to UNESCO (UNESCO, 2020) during the first half of 2020, around 91% of the world's enrolled learners were obliged to continue their education remotely. This sudden shift away from the classroom didn't find all teachers prepared to cope efficiently with the new online teaching challenges such as the ability to create or find and adapt online teaching material. In fact, UNESCO (UNESCO, 2019) had already discussed the need to train teachers on accessing, using, adapting, creating, and sharing Open Educational Resources (OER). But how easy is it for teachers to acquire the adequate skills to use OER efficiently? The truth is that teachers need new skills and knowledge to make the most of OER (OECD, 2020).
This paper aims at presenting an OER competences framework that can successfully address todays' teachers' needs to use OER efficiently in their teaching practice. This framework proposes a set of competences that include theoretical knowledge, practical skills, and specific attitude that the "digi-teacher" should have in order to be able to explore, evaluate and select an OER as well as to use, create and share an OER under the right OER open license.
The paper will also present a questionnaire based on the proposed OER competence framework that could be used by the "digi-teachers'' as a self-assessment OER competence tool. Finally, the paper concludes with the future research steps.

Keywords: oer competences, framework, open education, open educational resources, teachers' competence, teachers' digital competence, teachers' digital skills, teachers' professional development, teachers' skills

1. Introduction

In the age of digitization there is a growing need for teachers to acquire new sets of skills and competences in order to face the new digital challenges that they encounter in their work and in their daily life. One of these competences is the digital competence which is one of the eight key competences for lifelong learning needed in the 21st century, according to the Council of Europe (EU, 2006). During the covid-19 emergency 91% of teachers were constrained to deliver all their courses online (UNESCO, 2020), but also to create their own digital material or use, adapt and create openly accessible digital teaching material. This was not an easy process because not all teachers were prepared to cope efficiently with the new online teaching challenges. In fact, UNESCO (2019) had already discussed the need to train teachers on accessing, using, adapting, creating, and sharing Open Educational Resources (OER). In the same report (UNESCO, 2019), Open Educational Resources (OER) were defined as "teaching, learning and research materials that make use of appropriate tools, such as open licensing, to permit their free reuse, continuous improvement and repurposing by others for educational purposes". But how easy is it for teachers to acquire the adequate skills to use OER efficiently? The truth is that teachers need new skills and knowledge to make the most of OER (OECD, 2020).
Integrating efficiently OER in the teaching practice is more than knowing where to search and discover OER. Teachers should understand the pedagogical philosophy behind the use, creation and share of digital material. OER are innovative and valuable not just because they are free but because teachers can creatively adapt them taking under consideration the needs of their students and then re-share them to a wider teaching community. In this way, teachers transform OER to Open Education Practices (OEPs) embracing the "Open Education

Philosophy" and the "worldwide OER movement" which is rooted in the human right to access high-quality education. Open Education Practices (OEPs) is more than using OERs but they are teaching techniques that draw upon OERs in order to facilitate collaborative and flexible learning (Beetham et al., 2012). According to OER commons (OERcommons.org) "OEPs leverage open educational resources to expand the role of educators, allowing teachers to become curators, curriculum designers, and content creators. In sharing teaching tools and strategies, educators network their strengths and improve the quality of education for their students". In fact, via the OEPs learners, teachers, and the at-large community work as co-creators on a shared resource or toward the achievement of a common real-world goal (Campell, 2017). Hegarty (2015) has also sustained that OEPs encourage connectedness, trust, and innovation and proposed eight main OEP attributes that include among others creativity, sharing, participatory technologies, peer review and learner-generated content. Wiley (2017) has also described what teachers can do with the OER proposing the "4Rs framework" which describes the four most important OER rights:

1. *Reuse*: the right to reuse the content in its unaltered / verbatim form;
2. *Revise*: the right to adapt, adjust, modify, or alter the content itself;
3. Remix: the right to combine the original or revised content with other content to create something new;
4. *Redistribute*: the right to make and share copies of the original content, your revisions, or your remixes with others.

Perifanou & Economides (2021) explained that an OERs & OEPs competent teacher should be able to find, evaluate, use, create, and share OERs & OEPs, communicate and collaborate with students and peers using open digital technologies as well as utilize open pedagogies, teaching, and assessment methods. Open educational resources and practices are fully interconnected and this is important to be defined. The need for teachers to acquire new sets of skills and knowledge in order to make the most of OERs is growing continuously and this paper is proposing a framework which analyses the competences that teachers need in order to overcome OER-related barriers and integrate them successfully in Education. In order to answer this research question, the paper briefly presents a related literature review and then continues with the presentation of the research methodology. After this, the author describes the process adopted to design the proposed *OER framework for the "Digi-teacher"* as well as the *OER questionnaire for Self-Evaluation of the "Digi-teacher"* which is based on the framework. Finally, the paper concludes with the major conclusions of this research and suggests future research steps.

2. Background Literature and concepts

The first step of the research was to identify the basic skills and knowledge that a teacher should possess in order to be able to integrate OER in his/her teaching and to explore if there is any related research in this area.

2.1. Defining Competence

During the last 50 years there are numerous definitions as regards to the term "competence" as it is a term that has been discussed and investigated in many domains from different perspectives. In fact, there is such confusion and debate about the concept of competence that it is impossible to identify one definition (CEDEFOP, 2006). White (1959) brought up the term competence for the very first time as a concept for performance motivation while later Hayes (1979) described competences as a blend of knowledge, motivation, social characteristic and roles, or skills of one person in accordance with the demands of organizations of their clerks. According to Draganidis & Mentzas (2006) competency is a combination of tacit and explicit knowledge, behaviour and skills that gives someone the potential for effectiveness in task performance. More recently, European Commission (2018b, p.1) has defined competences "as a combination of knowledge, skills and attitudes appropriate to the context, and where: a) knowledge is composed of the facts and figures, concepts, ideas and theories which are already established and support the understanding of a certain area or subject; b) skills are defined as the ability and capacity to carry out processes and use the existing knowledge to achieve results; c) attitudes describe the disposition and mind-sets to act or react to ideas, persons

or situations". This last definition has inspired the design and development of the "digi-Teacher" OER competence

2.2. Competence Frameworks on OER

Before the design of the OER competence framework for the "Digi-Teacher", a literature review study was carried out in order to explore and map any previous research related to competence frameworks on OER. Results have shown that there is no previous research that specifically focuses on the creation of any OER-specific competence framework for teachers. Instead, this study has found that there is an extensive literature on teachers' digital competences, digital literacy frameworks and digital assessment tools (Bundy, 2004; DBE, Republic of South Africa, 2015; Falloon, 2020; Government of British Columbia, 2015; Kelentrić, Helland & Arstorp, 2017; Hinrichsen & Coombs, 2013; International Society for Technology in Education, 2017; Klebansky & Fraser, 2013; Krumsvik, 2014; Mishra & Koehler, 2006; NAACE, 2021; JISC, 2014; OECD, 2018; Puentedura, 2006; Reedy & Goodfellow; 2012; UNESCO, 2008; UNESCO 2011, UNESCO, 2018). But how is defined digital competence? According to Ferrari (2012) "Digital Competence is the set of knowledge, skills, attitudes [...] that are required when using ICT and digital media to perform tasks, solve problems, communicate, manage information, collaborate, create and share content, and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socializing, consuming, and empowerment." The ability to use, create and share properly OERs is described as one of the basic digital skills in most of the digital frameworks and assessment tools. For example, the well-known "Digital Competence Framework for Educators" (DigCompEdu) classifies the main components of the digital competence in twenty-two (22) various competences and in six (6) basic areas: i) Professional Engagement; ii) Digital Resources; iii) Teaching and Learning; iv) Assessment; v) Empowering Learners and vi) Facilitating Learners' Digital Competence (Redecker, 2017). The area that focuses on digital resources analyses the skills that a teacher should possess in order to use, create, manage and share OER properly. More concretely, we have defined specific areas of OER competences that could be included in an OER-specific competence framework for teachers based on the exploration and analysis of more than 20 digital competence frameworks and digital assessment tools for teachers such as the SAMR framework by Puentedura, 2006; the Teacher Digital Competency (TDC) framework by Falloon, 2020; the Jisc's Digital Literacies Framework by JISC, 2014; the Professional Digital Competence Framework for Teachers in Norway by Kelentrić, Helland & Arstorp, 2017; The framework for ICT literacy proposed by the American Educational Testing Service, 2002; the Technological Pedagogical Content Knowledge TPACK Framework by Mishra & Koehler, 2006, the UNESCO ICT Competency Standards for Teachers by UNESCO, 2008; the Common Digital Competence Framework for Teachers by INTEF, 2017; the UNESCO ICT Competency Framework For Teachers by UNESCO, 2011 & 2018; the 2digi Digital Literacy Assessment Tool created by the 2digi project, 2018; the TESOL technology standards framework, TESOL, 2009, the CPD Framework for Teachers of English by the British Council (2011) and more

3. Methodology

The methodologies adopted in order to define the OER competence framework for "digital teachers" was based on the Action Design Research (ADR) method (Sein et al., 2011) (Figure 1), which according to literature is a well-suited methodological basis for the development, implementation and evaluation of frameworks (Voß et al., 2018) but also for organizing the research process in projects of several disciplines (Haj-Bolouri, et al., 2018).

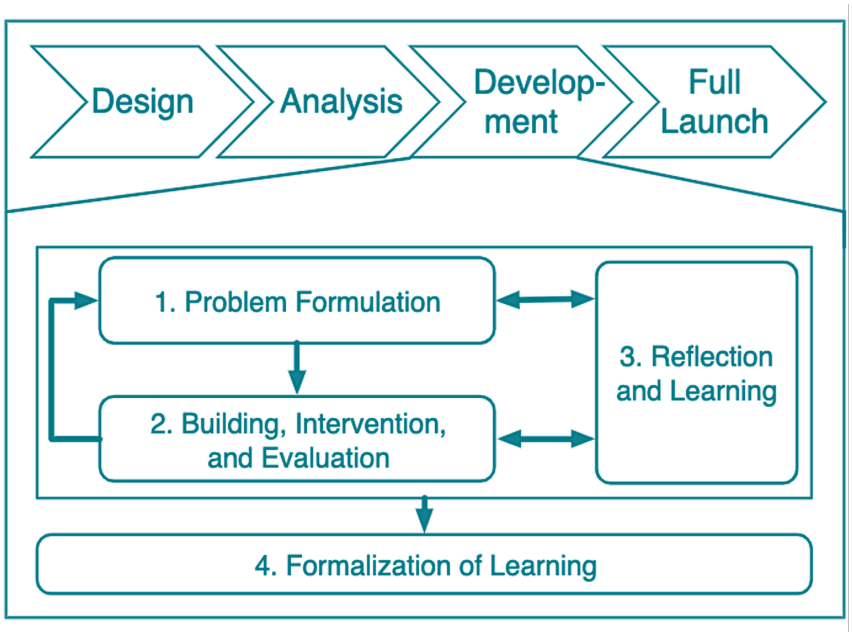

Figure 1: Action Design Research (ADR) method (Sein et al., 2011).

The ADR method (Sein et al., 2011) enables the creation of innovative (IT) artifacts to solve a problem in the organizational context. It follows a design pattern that includes four distinct design cycles: 1) diagnosis, 2) design, 3) implementation, and 4) evolution. Each ADR cycle moves through activities of problem formulation, artefact creation, evaluation, reflection, and learning. (Mullarkey & Hevner, 2019).

- *1st phase-> Diagnosis:* As far as the first research phase is concerned, we defined the research question as described previously: Is there any OER competence framework for teachers? After a systematic literature review, which was also described in the previous section, the results have shown that there is not any OER competence framework addressing the OER needs of teachers and students. This is the problem that needs to be resolved.
- *2nd Phase-> Design:* The main objective of this phase was to design the "Digi-teacher" OER competence framework. In order to define the components of this framework, first we analysed the 20 digital competence frameworks that were selected during the systematic literature review (Section 2). This analysis was done based on specific criteria that were exploring the different skills needed by teachers in order to use, create, manage and share OER. All identified OER knowledge and skills were grouped in six (6) different OER competency categories based on their content: 1) OER technical competence, 2) OER quality competence, 3) OER licensing competence, 4) OER teaching, 5) OER assessing, and 6) OER community. Based on these competence categories it was designed the "Digi-teacher" OER competence framework which analytically presents all the OER knowledge and skills that a teacher should possess and include as well three (3) levels of OER competences: a) novice, b) proficient, c) expert.
- *3rd Phase-> Implementation:* The main aim of this phase was to evaluate the proposed framework. This was done through the organisation of two mini online focus groups. Focus groups constitute a research method that researchers use in order to collect qualitative data, through interactive and directed discussions. We adopted a specific guideline on how to conduct focus-group online discussions that included criteria such as the relaxing atmosphere created by the moderator, homogeneity of the group video recording, support by the note taker, use of a list of questions with evaluation criteria as well as specific discussion topics. The duration of each mini group did not exceed 60 min. The author acted as the moderator and an external collaborator acted as the observer and note-taker. Each focus group consisted of 6 participants. In the first one participated in service teachers and researchers and in the second one future teachers. Initially, the focus groups' participants were introduced to the concept of OER and the purpose of the focus group discussion. During the first part

of the discussion a short list of questions triggered discussions among the participants (i.e, what skills do you need in order to find educational resources? What skills do you need in order to manage and use OER? What skills do you need in order to share educational resources?, etc.). In the second part, all participants were invited to evaluate a first draft of the OER framework for the "Digi-Teachers" based on specific evaluation criteria that tested its clarity, accuracy, precision, consistency, feasibility, and its logical and practicality following the Likert scale.

- *4th Phase*->Evolution: During the fourth and last step of the ADR method, it was developed a self-assessment tool which any teacher can use in order to control his/her OER competences using the Likert scale. Both the literature review and the focus group findings inspired the design of the OER Framework as well as the self-assessment OER questionnaire for the "Digi-Teachers", which are presented and analyzed in the following sections.

4. The OER Competence Framework for "Digi-Teachers"

In this section, it will be presented and analysed in a more detailed way the proposed *OER Competences Framework for the "Digi-Teachers"* (Figure 2). Based on literature review findings and the feedback received from the focus groups it was designed a final version of the framework of the OER competences for the "Digi-Teachers". The profile of an OER competent "Digi-Teacher" should encompass various competences which refer to specific knowledge and skills. These are grouped in six main categories (yellow frame): *1) OER technical competence, 2) OER quality competence, 3) OER licensing competence, 4) OER teaching, 5) OER assessing, and 6) OER community.* The activities that are presented in the green column describe all the OER activities that a "Digi-Teacher" should be able to do while the blue column provides information about the context in which the OER activities take place or define the OER type.

The framework also proposes three proficiency levels, as not all OER activities require the same degree of expertise.

- The *OER Novice "Digi-Teacher"* possesses basic OER competences and is a quite good OER user, evaluator, and creator. More concretely, the OER Novice: can search for OER and discover a specific OER using search engines and basic metadata in OER repositories; can make a simple OER quality control; can integrate OER in his/her teaching practice as well as in the assessment of his/her students; The OER novice has a basic knowledge of open licenses and can create a simple teaching OER (ppt presentation or video).
- *The OER Proficient "Digi-Teacher"* possesses advanced OER competences and is a very good OER user, evaluator, and creator. More concretely, the OER Proficient can do all the above OER activities in a more efficient way and additionally can evaluate OER using advanced evaluation criteria; can retain OERs (make, own, and control copies of the content such as download, duplicate, store, and manage), can reuse an OER (use the content in teaching and students' assessment in a wide range of ways such as on a website, in a video); can revise OER (adapt, adjust, modify, or alter the content itself and share OER created by others in teaching and students' assessment); can remix OER (combine the original or revised content with other material to create something new for teaching or students' assessment); can create any type of OER using a variety of digital tools; can share OER copies with extra revisions, or remixes; can use all open licenses efficiently and can motivate and/or help students to use, create and share OER.
- *The OER Expert "Digi-Teacher"* possesses highly advanced OER competences and is an excellent OER user, evaluator, and creator but is also an OER trainer and pioneer that will continually try to evolve through professional development and research. More concretely, the OER Expert can do all the above OER activities in an exceptional way and additionally can offer OER training to other teachers; can apply innovative ways of using and creating OER in teaching and students' assessment; can share and show innovative ways of how to use and create OER for teaching and assessment in a wider teaching community or in his/her educational community; can advance the OER field conducting research on OER and producing innovative section.

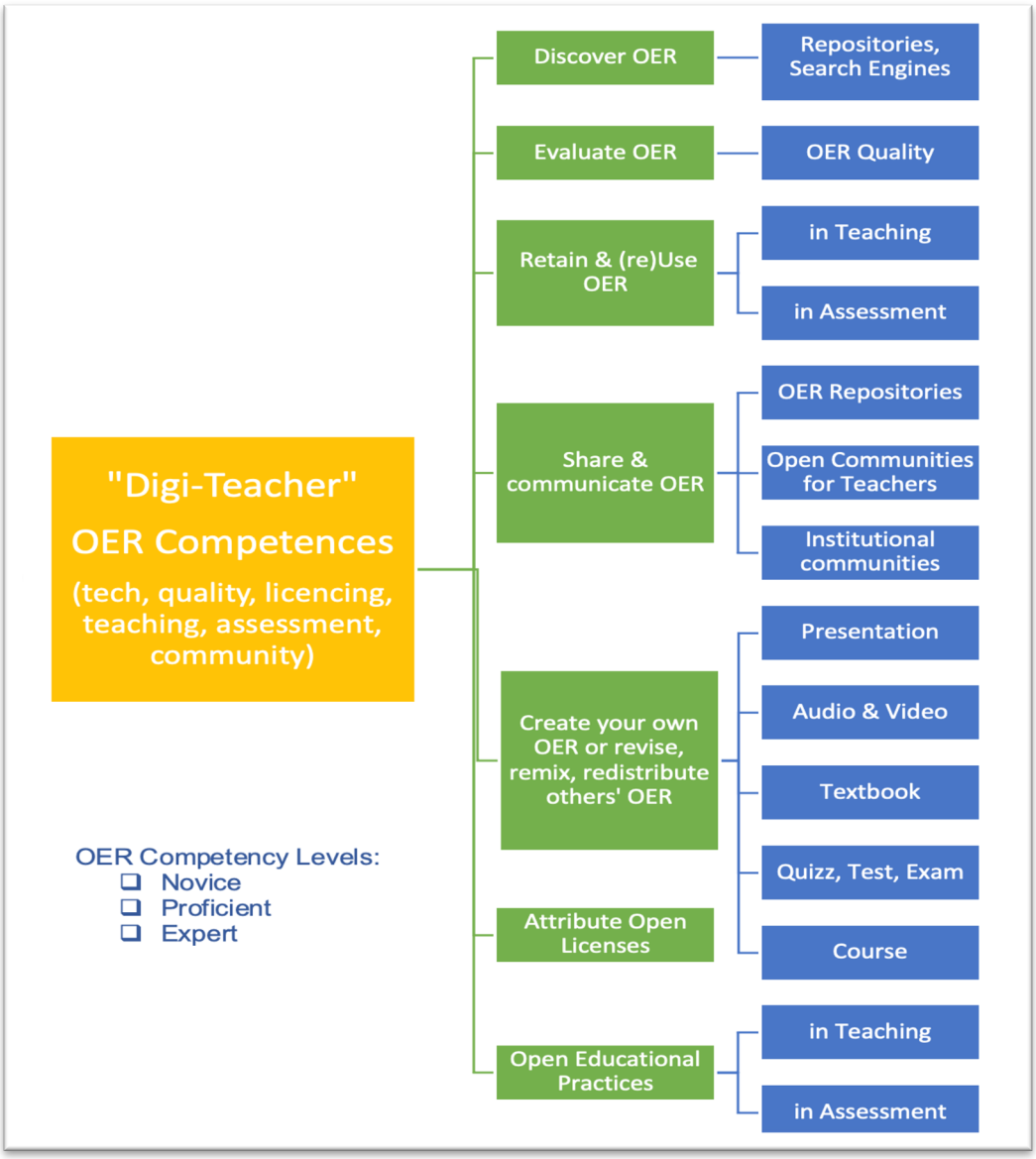

Figure 2: The OER Competences Framework for the "Digi-Teachers".

5. Questionnaire: The OER Competences Self-Assessment Tool for the "Digi-Teachers"

As it was aforementioned during the fourth and last step of the ADR method, it was developed an OER competences self-assessment tool for the "Digi-Teachers" which any teacher can use in order to evaluate and reflect on his/her OER competences. The questionnaire is using the Likert scale and teachers can mark how confident they feel to do the following OER activities: 1 *="not at all confident"*, 2*="Only Slightly Confident"*, 3*="Somewhat Confident"*, 4*="Moderately confident"*, 5*="very confident"*. The questionnaire comprises six (6) different categories: *1) OER technical competence, 2) OER quality competence, 3) OER licensing competence, 4) OER teaching, 5) OER assessing, and 6) OER community* and describe a variety of OER activities that teachers may feel competent to do or not. This self-assessment tool is interconnected with the framework and it can also serve as an OER competence guide for teachers that could be used in OER teachers' training courses.

Table 1: The OER Competences Self-Assessment Tool for the "Digi-Teachers".

OER Technical competence	**1**	**2**	**3**	**4**	**5**
I can search for and find a specific OER using search engines (advanced research metadata) and OER repositories.					
I can search and find a suitable OER for a specific educational objective using keywords and filters (e.g., material type, media format, educational level, open license) in search engines and repositories.					
I can monitor OER repositories for newly available OERs that are appropriate for my teaching.					
I can download an OER and install it in my computer or smartphone					
I can use an OER either in my computer or mobile phone or the cloud.					
I can modify, adapt, revise, translate an OER to create a new OER.					
I can combine, mix OERs to create a new OER.					
I can create an open presentation.					
I can create an open audio & video.					
I can create an open textbook.					
I can create an open quiz, test, exam.					
I can create an open course.					
I can create my own OER using an open author of an OER repository (i.e., *oer commons*).					
I can create and manage my own OER group/hub in an OER repository					
I can use web tools that assist users of CC material to properly attribute open licenses to an OER (i.e., *"Open Attribution Builder"* by *Open Washington*)					
I can attribute the open license in different formats (website, video, photo, text).					
I can share an OER in an appropriate open repository using the right metadata and tools.					
OER Quality competence	**1**	**2**	**3**	**4**	**5**
I can use OER quality tools and frameworks					
I can review an OER on a repository.					
I can evaluate the quality of an OER using appropriate quality criteria.					
I can create a medium quality OER					
I can create a high quality OEP					
OER Licensing competence	**1**	**2**	**3**	**4**	**5**
I can identify the open license of an OER.					
I can attribute open licenses to an OER.					
I can inform others about the pro e cons of different open licenses.					
I can support the adoption of OER policies and initiatives.					
OER Teaching competence	**1**	**2**	**3**	**4**	**5**
I can discover an adequate OER for teaching a specific topic.					
I can use OERs of different formats in my teaching practice.					
I can create and share teaching material based on OER that is related to the subject I teach (re-use, revise, remix, create & share).					
I can create my own list of OEPs.					
I can create and apply student-centred OER-based teaching methodologies.					
I can create and apply collaborative OER-based teaching methodologies.					
I can promote the idea of OER being an advocate and ambassador of OER.					
I can apply innovative ways of using and creating OER in my teaching					
OER Assessment competence	**1**	**2**	**3**	**4**	**5**

I can use an OER in students' assessment (pre/ continuous /post assessment).					
I can orientate students to use OER for Self and Peer-assessment.					
I can apply innovative ways of using and creating OER in students' assessment					
OER Assessment competence	**1**	**2**	**3**	**4**	**5**
I can share an OER in an appropriate open community.					
I can share an OER in my educational community (i.e., school).					
I can inspire, motivate and/or help students to use, create and share OER.					
I can inspire, motivate and/or help teachers to use, create and share OER.					
I teach others on how to discover, evaluate, use, create, and share OER.					
I can share my OEP with a wider teaching community or with my local teaching community.					
I can share and show innovative ways of how to use and create OER for teaching and assessment in a wider teaching community or in my educational community.					
I can share and show innovative ways of how to use and create OER for teaching and assessment in a wider teaching community or in my educational community.					
I can do research on OER and produce innovative result.					

6. Conclusions and future research

In the digital era, Open Educational Resources (OER) can offer opportunities for systemic change in all levels of education, engaging educators and learners to embrace a new participatory way of teaching and learning. The aim of this article was to develop an OER competences framework for the digital teachers, the "Digi-Teachers", that could explain and define what knowledge and skills they should possess in order to make the most of OER. Furthermore, this paper proposed an OER competences assessment tool that could facilitate teachers not only to assess their OER competences, but also to explore further the potentials of OER in their teaching practice.
The future research aims to continue testing the OER Competences Self-Assessment Tool for the "Digi-Teachers" in future training sessions on OER with teachers of different subjects and from different levels of education. The main idea is to improve the tool but also to invite more teachers to join the wonderful OER movement that can transform teachers' way of teaching and training forever.

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Online Assessment

Can e-assessments be more than just an 'emergency solution'? - Higher education readiness for online assessments versus room for improvement.

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Abstract
At the FHW University of Applied Sciences for Management and Communication, the Vienna Competence team for the Digitalisation of Communication has researched digital trends and development in Communication and Higher Education since 2019. Therefore, the COVID-19 pandemic, with its tremendous consequences and impact on peoples' lives, has further strengthened an existing research trend towards more online learning in higher education. Within this project, two surveys were conducted in 2020 and 2021. Students and lecturers from all study programs (10 BA- and 10 MA programs) participated in evaluating their experiences during the COVID-19 pandemic. Of particular interest in this study were their opinions about 'e-assessments' to work on, develop and improve the e-assessment and online assessment experiences in future higher education.
In line with the 'I-HE2021 EADTU' conference "Higher education in the new normal, the role of online, blended and distance learning", this proposal attempts to develop further, so-called "emergency solutions" for e-assessments and online assessments. Based on the insights of this study, this proposal discusses students' and lecturers' experiences while putting them together with existing 'security trends' in other industries. Different scenarios will be created which might contribute to the quality of the assessments, ensure the identification of the participants, and open new possibilities for using e-assessments as reliable tools in Post-COVID-19 times.

Keywords: higher education, e-assessment, students, lecturers, online teaching

1. Introduction
The COVID-19 pandemic has brought not only a global health crisis but also a shift towards a more digitalised work environment. The pandemic has had a tremendous impact on all parts of society. Particularly interesting for this research paper is the education sector, which has been forced to change and adapt due to the closure of many higher education institutions (Al-Kumaim et al., 2021, Holzer et al., 2021, Taga et al., 2020, Mohamed et al., 2020). The transition to Online Learning had to happen fast and therefore caused many challenges and difficulties linked to the sudden changes. Mental health problems and digital inequality were just two elements named by various scholars (Berghoff et al., 2021, Marczuk et al., 2021, Al-Kumaim et al., 2021, Pokhrel & Chhetri, 2021, Walwyn, 2020, Rashid & Yadav, 2020).

The pandemic led to a major push towards the digitalisation of higher education. Even though the concept was not new, it was accelerated (Hargitai et al., 2021, Al-Kumaim et al., 2021, Kreulich et al., 2020). The sudden need for digital competencies impacted many institutions. However, the implementation of Distance Learning still varies greatly (Holzer et al., 2021, Farnell et al., 2021, Berghoff et al., 2021, Kreulich et al., 2020). Now that the COVID-19 pandemic has been going for more than 19 months, many advantages of Online Learning have

been recognised, such as flexible study modes, streaming sessions, eLearning platforms, etc. (Pokhrel & Chhetri, 2021, Marczuk et al., 2021, Berghoff et al., 2021, Kreulich et al., 2020).

At the FHW University of Applied Sciences for Management and Communication, the City of Vienna Competence team for the Digitalisation of Communication has conducted research on digital trends and development in Communication and Higher Education since 2019. Due to the COVID-19 pandemic, four surveys were conducted in 2020 and 2021. Students and lecturers from all different study programs (10 BA and 8 MA programs) participated. The purpose of the studies was to evaluate students‘ and lecturers‘ experiences during the COVID-19 pandemic.

In line with this year’s I-HE 2021 conference ‘Higher Education in the New Normal, the role of Online, Blended and Distance Learning’, the particular interest of this study was higher education experiences of ‘e-assessment’. Based on the insights of the surveys conducted by the Competence team, this research paper discusses the different experiences of ‘e-assessment’ while combining the insights with existing ‘trends’ in other industries. Different processes and approaches will be discussed which might contribute to the quality of e-assessment to open new possibilities of using e-assessments as a reliable tool in post-COVID-19 times.

There is an awareness that the results of the conducted surveys represent short-time consequences rather than long-term consequences (Farnell et al., 2021). Taking this into consideration, they are still considered to be relevant to improve the Online Learning experience for higher education students and to understand how e-assessments work (Marczuk et al., 2021, Walwyn, 2020).

2. Methodology

Due to the sudden transition to Online Learning caused by the COVID-19 pandemic, both students and lecturers at the FHW were obliged to change their modes of working. The Competence team for the Digitalisation of Communication aimed at gaining insights from these experiences and developed a series of COVID-19 surveys for students and lecturers at the FHW. While the focus of the surveys conducted in 2020 had a more general approach to understand students’ and lecturers’ experiences throughout the first weeks of the COVID-19 pandemic, the surveys conducted in 2021 attempted to explore issues that had arisen in detail.

Within the survey conducted in 2020, students mentioned that there is still improvement when it comes to the clarity and goals of Online Learning and that provided material was sometimes insufficient to process given tasks. What was also striking was that students stated that some lecturers do not estimate the workload for independent assignments correctly. Most of the students also agreed that the quality of Online Learning varies greatly from one course to another. Furthermore, it was surprising to see that dividing students into full-time and part-time students and the general Distance Learning agreement was lower for part-time students. The disagreement from this group was significantly higher than for full-time students.

Taking into consideration the feedback shared by students, an attempt was made to explore the different issues that have been mentioned by students in more detail. Amongst the topics mentioned was ‘e-assessment’. To optimise how e-assessment was conducted during the COVID-19 pandemic and beyond, a focus was therefore set within the next survey, which was conducted with lecturers in 2021. While being part of a bigger survey, this focus aimed to understand the ‘e-assessment’ situation from lecturers’ perspectives to gain knowledge that could then be used for optimisation.

Therefore, it is necessary to define the term ‘e-assessment’ and how it was used for the purpose of this study. For this, the definition of Weleschuk et al. (2019) was chosen. This study group elaborated a similar research

interest to the one of this paper in pre-COVID-19 times. Putting their definition into the context of COVID-19, this paper aims at developing the existing insights. As Weleschuk et al. (2019, 5) state: "We consider online assessments to be any means of evaluating student achievement, providing feedback, or moving the students forward in their learning process […]. These assessments can be completely online (such as online exams) or just require online submission (such as essays). Assessments can be either formative, designed to monitor students' progress in a low or no stakes environment, or summative, designed to evaluate students against a standard or criteria". Even though this definition might seem broad, it was chosen because it leaves space to understand different approaches to e-assessment and is not limited to study-specific platforms. After having defined the term 'e-assessment,' it is necessary to look at the research questions of this paper.

As the overall research question, the following question was defined: **Based on the experience with e-assessment and the data survey during the Covid-19 pandemic, what could be the processes and approaches that contribute to enhancing students and teaching staff experiences with e-assessment?** This research question will be answered based on the data obtained during the surveys. The description of the sample will be explained in the next section.

3. Description of the sample

This research paper is based on the outcome of two surveys – one with students of the FHW University of Applied Sciences for Management and Communication and the other with lecturers of the same institution. The survey with students was conducted from March 2nd, 2021, to March 20th, 2021. It was a follow-up survey to another one conducted between April 8th, 2020 and April 22nd, 2020. The survey with lecturers was conducted from June 3rd to June 17th, 2021, as a follow-up survey to one conducted from April 20th 2020, to April 22nd, 2020. All surveys were created with UniPark.

The completion rate of the survey for students was 66.3% in 2021, with 561 students participating. The completion rate of the survey for lecturers was 70.35% in 2021, with 159 participating lecturers. During the student survey, the distribution of gender was 69.1% female and 30.9% male in 2021. During the lecturer survey, 56.6% were male participants, and 43.3% were female participants. The online surveys were sent out to all students and lecturers of the FHW University of Applied Sciences for Management and Communication. This university offers ten different Bachelor programs and eight different Master programs. In the student survey, mainly students from the Bachelor studies participated, with most participating students doing the BA in Management & Entrepreneurship, the BA in Finance, Accounting & Taxation and the BA in Tourism & Hospitality Management in 2021. In the lecturer survey, mainly lecturers from the BA in Management & Entrepreneurship, the BA in Corporate Communication, the BA in Human Resources Management, the BA in Marketing & Sales and the BA in Journalism and Media Management took part.

Regarding the survey for lecturers of the FHW, it needs to be added that 81.6% of the participants work as 'external lecturers' at the university, while the others, with 18.4%, are 'full-time employees' of the university.

4. Results of the survey

In the following, the results of the study will be presented. First, the results of the lecturer survey will be presented and put into context of the results of the student survey. After doing this, a variety of chosen processes and approaches will be presented, which might contribute to an optimisation of the current e-assessment situation.

4.1 E-assessment modes

Based on the research subject 'e-assessment', this research paper will present the empirical results which are relevant to answer the research questions. The outcome of the surveys went beyond the presented results.

In this survey, lecturers were asked about their opinion regarding the appropriation of existing e-assessment modes for 100% Distance Learning[1]. Existing e-assessment modes were defined as (1) individual presentations, (2) group-work presentations, (3) individual concept creation, (4) group-work concept creation and (5) written online examination alias Moodle quiz. Participants were given a range from 1 to 5, meaning (1) very appropriate, (2) appropriate, (3) partly appropriate, (4) less appropriate and (5) not appropriate at all. Even though the answers were quite similar, some differences could be detected. 67.9% found the individual concept creation very appropriate to appropriate (average of 2), while 65.8% found the individual presentation very appropriate to appropriate (average of 2.2). Very close to that, 60.1% stated that the group-work concept creation is very appropriate to appropriate. 64.5% of the lecturers found the group-work presentations very appropriate to appropriate, while 18.7% found them less appropriate to not appropriate at all (average of 2.3). 51% found the written online examination alias Moodle quiz very appropriate to appropriate, while 23.8% found them less appropriate to not appropriate at all [*See* Figure 1].

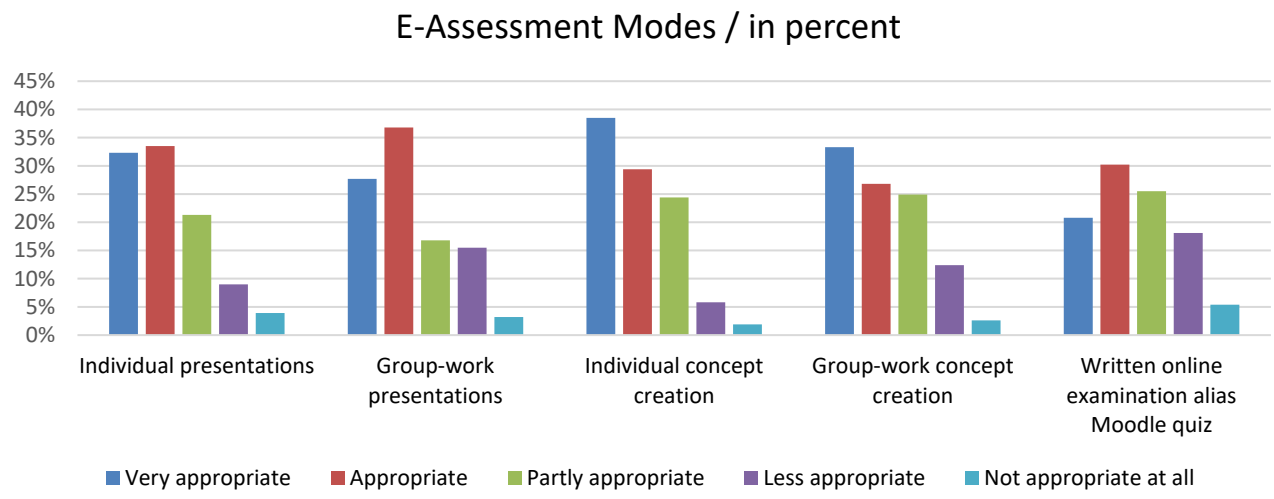

Figure 1: E-Assessment modes (Source: Compiled by the authors)

4.2 Usage of e-assessment modes

The lecturers were also asked which of the earlier mentioned e-assessment modes they have already used. E-assessment modes were defined as (1) individual presentations, (2) group-work presentations, (3) individual concept creation, (4) group-work concept creation and (5) written online examination alias Moodle quiz. Participants were given a range from 1 to 5, meaning (1) very often used, (2) often used, (3) partly used, (4) less often used and (5) not used at all.

58% of the participants very often or often used 'group-work presentations', while 27.1% stated to have used them less often or not used them at all (average of 2.6). 61.2% stated to very often have used or often used 'group-work concept creation', whereas 28.8% stated to have less often used or not used them at all (average of 2.6). 46.9% very often used or often used 'individual concept creation', 38.7% stated to less often used or not used them at all (average of 3). 35.5% stated to very often or often used 'individual presentations', contrary

[1] Even though the term 'Distance Learning' was used during the survey, in this paper it will be interchangeably used with the term 'E-Learning' or 'Online Learning'

to that, 48.2% to less often used or not used them at all (average of 3.3). Written online examinations alias Moodle quiz received an average of 3.6, and 29.5% stated to very often have used or often have used them, while 46% stated to not have used them at all [*See* Figure 2].

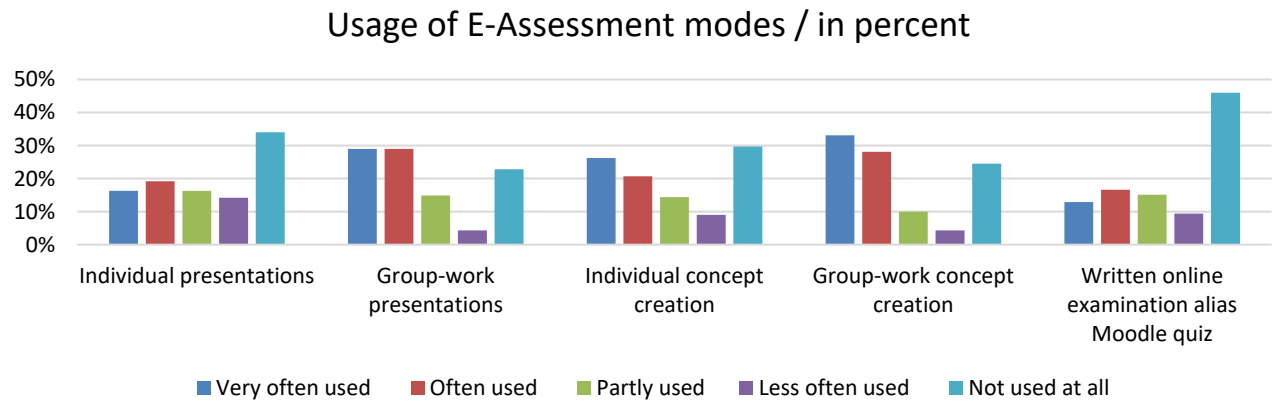

Figure 2: Usage of E-Assessment modes (Source: Compiled by the authors)

4.3 E-assessment possibilities

Participants of this survey were further asked about their preferences regarding e-assessment possibilities. E-Assessment possibilities were defined as (1) synchronous written exam with obligatory attendance (via Zoom/open book), (2) synchronous written exam without obligatory attendance (via Zoom/open book), (3) asynchronous written exam with delayed submission (from 12 hours to a couple of days) and (4) oral exams (1:1 between students and lecturers via Zoom). Participants were given a range from 1 to 5 (1) very appropriate, (2) appropriate, (3) partly appropriate, (4) less appropriate, (5) not appropriate at all. 55.9% of the participants found 'synchronous written exams with obligatory attendance (via Zoom / open book)' very appropriate to appropriate, whereas 19.1% found them less appropriate to not appropriate at all (average of 2.4). 59.3% found 'oral exams (1:1 between students and lecturers via Zoom)' very appropriate to appropriate, whereas 21.3% found them less appropriate to not appropriate at all (average of 2.4). 33.7% found 'synchronous written exams without obligatory attendance (via Zoom/open book)' very appropriate to appropriate, whereas 40.3% found them less to not appropriate at all. 37.7% found 'asynchronous written exam with delayed submission (from 12 hours to a couple of days)' very appropriate to appropriate, and 40.2% found them less appropriate to not appropriate at all (average of 3) [*See* Figure 3].

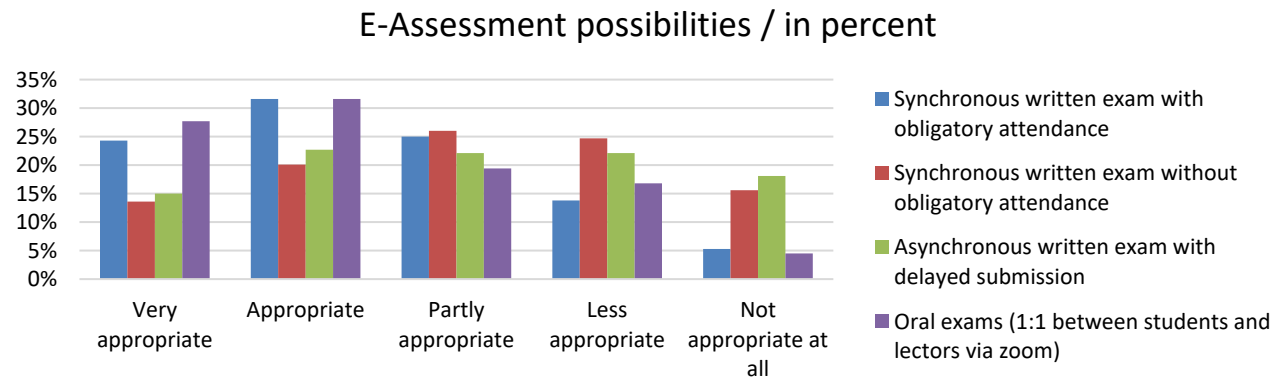

Figure 3: Usage of E-Assessment modes (Source: Compiled by the authors)

4.4 Usage of e-assessment possibilities

The lecturers were asked which of the earlier mentioned e-assessment possibilities they had already used. E-Assessment possibilities were defined as (1) synchronous written exam with obligatory attendance (via Zoom/open book), (2) synchronous written exam without obligatory attendance (via Zoom/open book), (3) asynchronous written exam with delayed submission (from 12 hours to a couple of days) to (4) oral exams (1:1 between students and lecturers via Zoom). Participants were given a range from 1 to 5, meaning (1) very often used, (2) often used, (3) partly used, (4) less often used and (5) not used at all. 43.6% stated to very often have used or often have used 'synchronous written exam with obligatory attendance (via Zoom/open book)', while 42.9% explained not to have used them at all (average of 3.3). 35.1% stated to very often have or often have used 'oral exams (1:1 between students and lecturers via Zoom)', whereas 44.5% stated not to have used it at all (average of 3.5). 33.1% stated to very often have used or often have used 'synchronous written exam without obligatory attendance (via Zoom/open book)', and 53.2% stated not to have used them at all (average of 3.6). Only 22.6% stated to very often have used or often have used 'asynchronous written exam with delayed submission (from 12 hours to a couple of days)', and 64.2% stated not to have used them at all (average of 4) [*See* Figure 4].

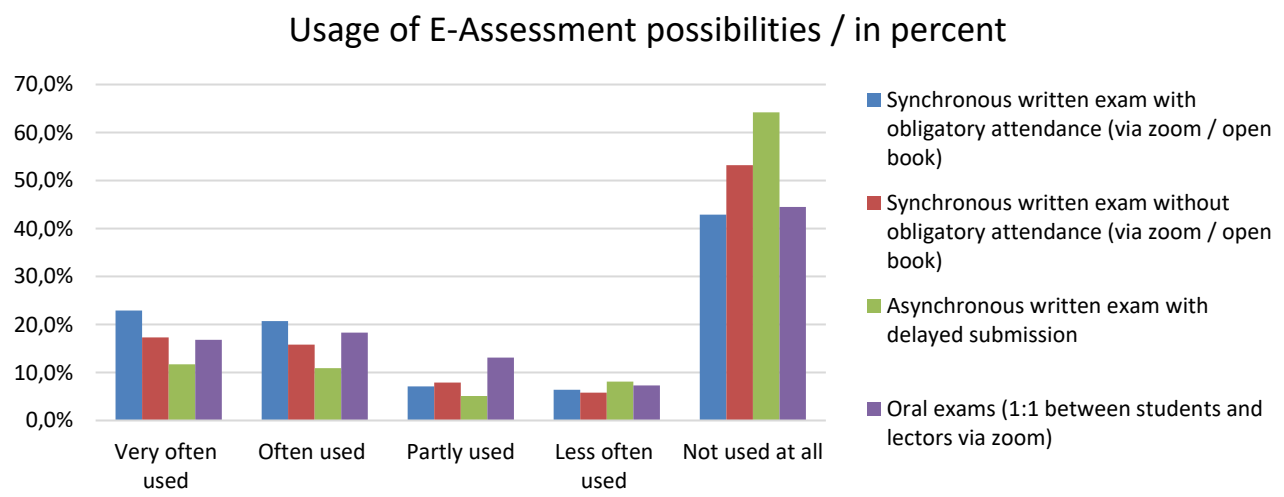

Figure 4: Usage of E-Assessment modes (Source: Compiled by the authors)

4.5 E-assessment additional learning material

Participants of the survey were also asked about the additional e-learning material they provide for students before and during assessment time. Additional e-learning material was defined as (1) additional e-assessment exercises practice before the e-assessment, (2) additional learning material before the e-assessment, (3) providing audio and video material in preparation for the e-assessment and (4) preference to do 2-3 tests to control the study progress before the written exam. The lecturers were given a range from 1 to 5 (1) full agreement, (2) more likely agreement, (3) partial agreement, (4) less likely agreement and (5) no agreement at all. 80% of the participants stated to fully agree or more likely agree to provide students with written material (presentations, PDF documents, articles, studies, etc.) in preparation for an online exam (average of 1.9). 72.6% fully agreed or more likely agreed that it makes sense to provide students with additional e-assessment exercises (average of 2.0). 41% fully agreed or more likely agreed to prefer 2-3 tests to control the study progress of students, whereas 13.9% disagreed with that (average of 2.9). 36.2% fully agreed or more likely agreed to prefer contributing audio and video material in preparation for an e-assessment, while 19% disagreed (average of 3.1) [*See* Figure 5].

Furthermore, the participants of the survey were asked whether they prefer (1) one single final exam, (2) one written exam compared to presentations or written concepts and (3) whether they think open book exams are easier than written final exams or (4) open book exams have more practical importance compared to written present exams. 39.1% of the participants fully agreed or more likely agreed that they prefer one final written exam for the overall performance evaluation of students, 22.5% stated not to agree to them at all (average of 3.1). 33.5% fully agreed or more likely agreed to prefer online exams to the submission of presentation or written concepts, 16.8% of the participants did not agree at all (average of 3.1). 33.7% of the participants fully agreed or more likely agreed that open book exams are easier than written final exams, 18.5% of the participants did not agree at all (average of 3.1). 37.2% of the participants fully agreed or more likely agreed that open book exams are more relevant to practice than written present exams. 14.6% of the participants stated that they do not agree at all (average of 2.9) [See Figure 6].

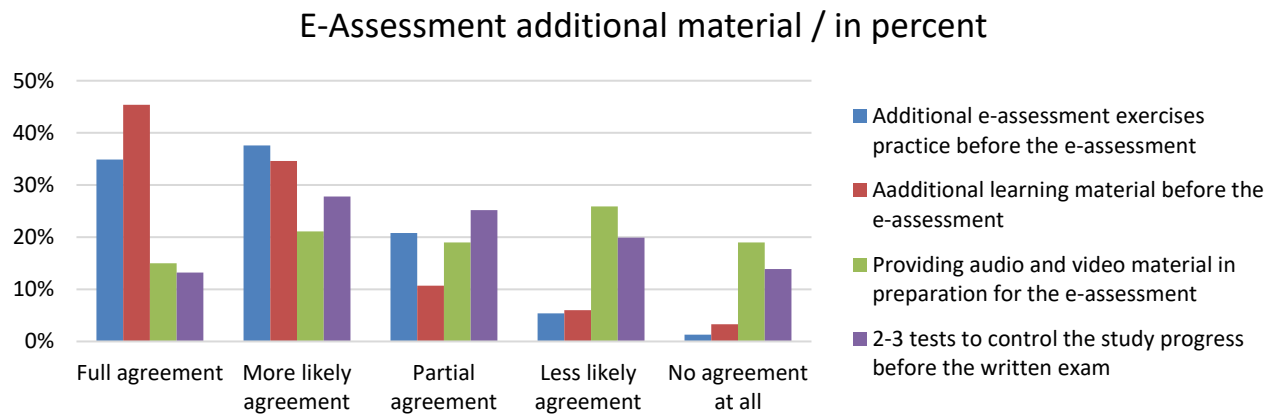

Figure 5: E-Assessment additional material (Source: Compiled by the authors)

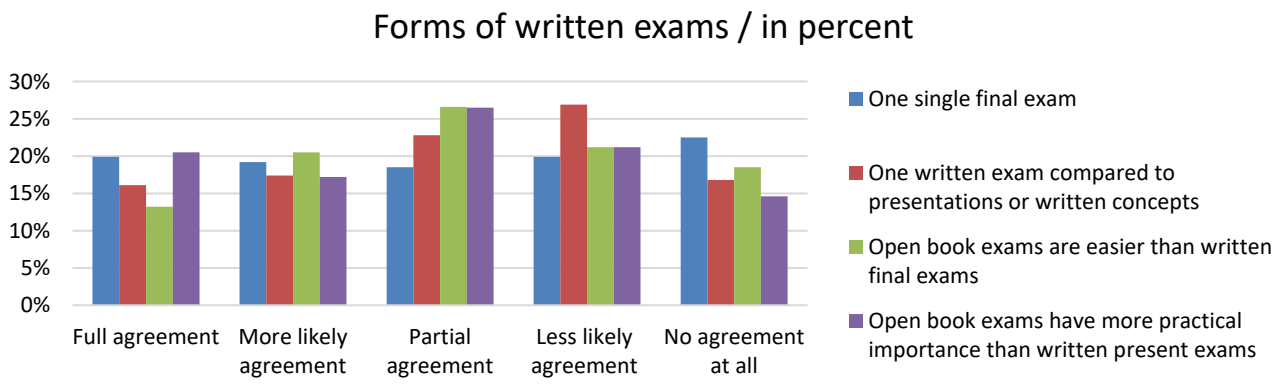

Figure 6: Forms of written exams (Source: Compiled by the authors)

4.6 Switch to Distance Learning

The participants of this survey were also asked about the consequences of the switch to Distance Learning. Consequences of the switch were defined as (1) quality of the submissions comparing asynchronous to synchronous teaching, (2) student cooperation in synchronous Distance Learning compared to present classroom teaching, (3) the difficulty of teaching digitally compared to classroom teaching, (4) the efficiency of independent studying and (5) Distance Learning contributes to independent studying. The lecturers were given a range from 1-5 (1) full agreement, (2) more likely agreement, (3) partial agreement, (4) less likely agreement, (5) no agreement at all and (6) don't know. The results of the surveys show that only 8.9% of the participants fully agree or more likely agree that the quality of the submissions of asynchronous distance learning is higher

than classroom teaching. 24.2% state that they do not agree at all with this, and 23.6% state that they don't know (average of 3.8). Only 10.2% of the participants fully agree or more likely agree that student cooperation in synchronous Distance Learning is more active than in classroom teaching. 43.6% think that this is not the case, and 8.3% state that they do not know (average of 4). 47.8% fully agree or more likely agree that it is more difficult to teach digitally compared to classroom teaching, 18.5% state that they don't think so (average of 2.9). 58% of the participants fully agree or more likely agree that it takes longer to teach content digitally than in classroom teaching. Only 12.7% of the participants disagree with that (average of 2.5). 29.4% fully agree or more likely agree that Distance Learning improves independent studying of students, while 17.7% do not agree (average of 3.2) [See Figure 7].

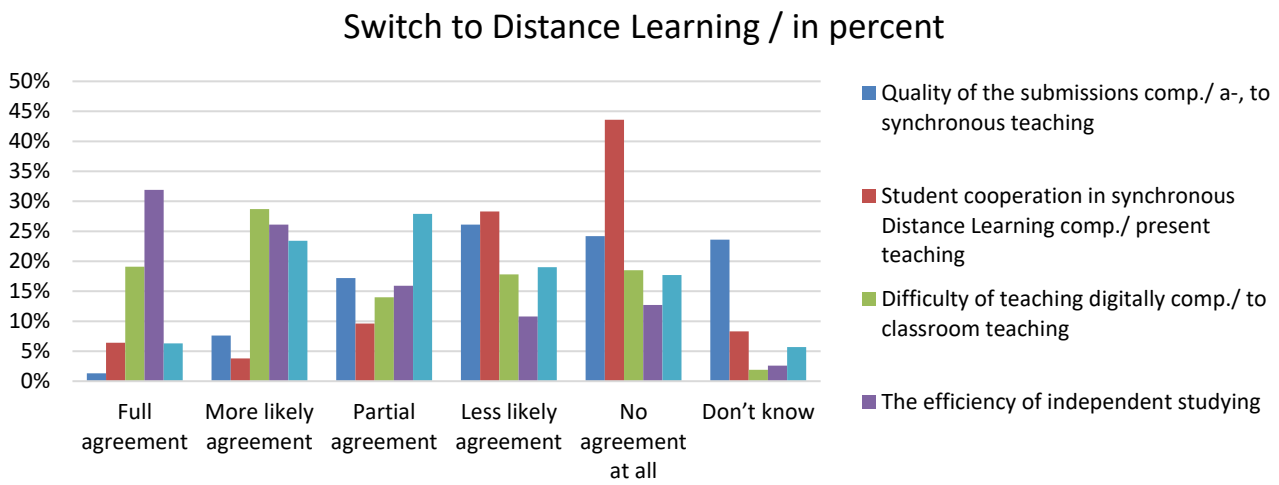

Figure 7: Switch to Distance Learning (Source: Compiled by the authors)

4.7 Comparing Distance Learning to Classroom Teaching

Within the survey, lecturers were also asked whether (1) students are equally active in Distance Learning as in classroom teaching, (2) students have deactivated the video function during Zoom calls, (3) distance learning worked well without technical issues and (4) student attendance in distance learning and classroom teaching was the same. Participants were given a range from 1 to 5 (1) full agreement, (2) more likely agreement, (3) partial agreement, (4) less likely agreement, (5) no agreement at all and (6) finally don't know. Only 21.5% of the participants fully agreed or more likely agreed that students were equally active in Distance Learning units than in classroom teaching, 28.5% didn't agree at all (average of 3.6). 64,8% of the participants fully agreed or more likely agree that students deactivate their video function during Zoom calls. Only 10.8% of the participants did not agree at all (average of 2.2). 84,3% of the participants fully agreed or more likely agreed that Distance Learning worked without technical issues. Only 1.9% stated that they did not agree at all (average of 1.8). 49.6 of the participants fully agreed or more likely agreed that students' attendance during distance learning and classroom teaching was almost the same, whereas 12.6% of the participants did not agree at all, and 7.6% stated that they do not know (average of 2.7) [See Figure 8].

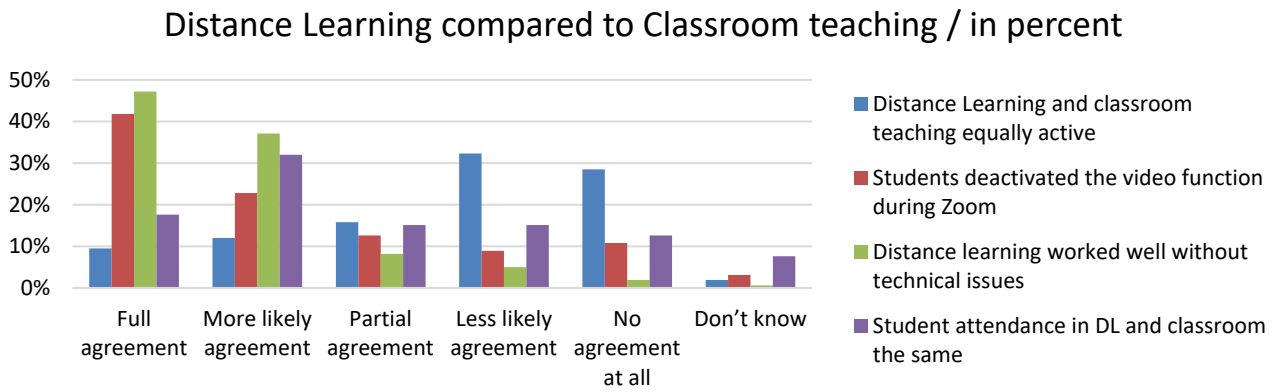

Figure 8: Distance Learning compared to Classroom teaching (Source: Compiled by the authors)

4.8 Co-working with students in Distance Learning times

The lecturers were also asked about co-working with the students during COVID-19. Co-working is defined as (1) student motivation during Distance Learning compared to classroom teaching, (2) the improvement of collaboration with students due to online communication tools and (3) equal obligatory attendance for distance learning and classroom teaching. Participants were given a range from 1 to 5 (1) full agreement, (2) more likely agreement, (3) partial agreement, (4) less likely agreement, (5) no agreement at all and (6) don't know. 56.6% of the participants fully agreed or more likely agreed that the motivation of students is less in Distance Learning compared to classroom teaching. 10.7% of the participants did not agree at all, whereas '6.9%' stated that they do not know (average of 2.4). 20.2% of the participants stated that the collaboration with students has improved due to the usage of online communication tools (such as WhatsApp, Facebook, Zoom, Microsoft Teams, etc.). 47.5% of the participants were less likely to agree or not agree at all, whereas 8.9% stated that they do not know (average of 3.5). When lecturers were asked whether they wanted Distance Learning to have the same obligatory attendance as classroom teaching (which means 75% of the classes), 68% fully agreed or more likely agreed, whereas 14.7% less likely agreed or not agreed at all, 9.6% answered with a don't know (average of 2) [See Figure 9].

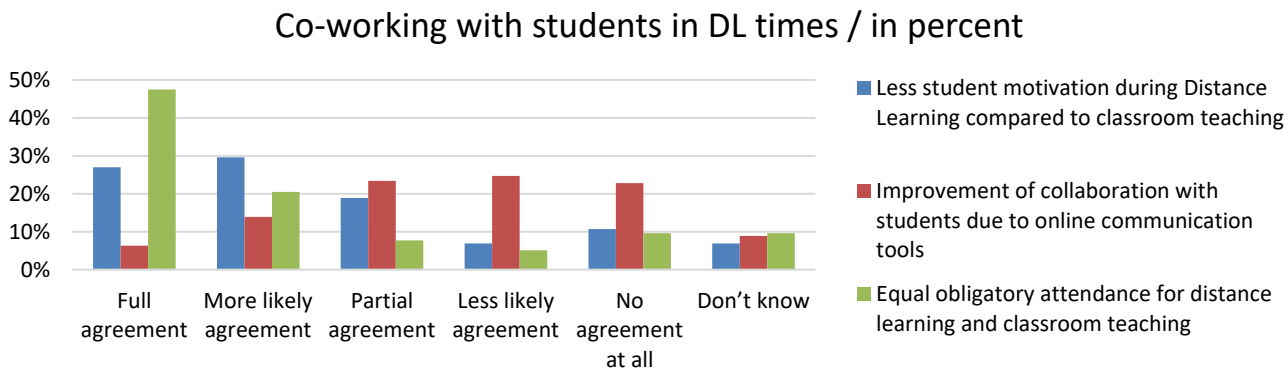

Figure 9: Co-working with students in Distance Learning times (Source: Compiled by the authors)

After presenting the survey results, the following conclusions can be drawn: There is a general agreement amongst lecturers that teaching and assessing online is more difficult than in classroom teaching. According to the shared opinions, this might be caused by a lack of motivation by students. It could be influenced by other factors, such as missing interaction between the lecturers and the students (no direct contact, as students do

not switch on their videos during Zooms). There is an understanding amongst lecturers that the quality of Distance Learning is less than in classroom teaching.

Even though lecturers agree that individual presentations and individual concept creations work well during Distance Learning, in reality, group works are carried out more often. Lecturers are aware of the importance of providing students with additional learning material, especially for exam preparation. Opinions about e-assessments that work well vary greatly. Some lecturers prefer one single exam, while others prefer open book exams.

The outcome of this survey shows that a more general approach towards e-assessment is needed, as the modes and forms of e-assessment used by lecturers vary greatly amongst each other. Because of that, this research article aims to provide different solutions, which might help give e-assessment at the FHW more structure and efficiency.

5. Didactical approaches

Many attempts have been made to define the role of media in education. However, so far, there has been no agreement on its importance and influence. On the one hand, different forms of media have played and continue to play an important role in learning. On the other hand, only when new media emerges and influences learning are they considered significant in education practice and research. One form of media, digital media, particularly highlights those discrepancies. Its importance for education has been a highly controversial discussion (Rohs, 2017, p.232). Such controversies interfere with decision-making processes. However, during the pandemic of 2020, there was no time for controversies. Traditional assessment processes had to change into e-assessments or online assessments very quickly. These changes still remain today.

During this period, higher education institutions – including the FHW – had the chance to learn and understand the different opportunities and challenges these changes involved. In this paper, the opportunities and challenges posed using digital media in students' assessment processes will be addressed to find out how to improve them within the use of digital technology. As the research objectives of this study, e-assessment process improvements were defined with the following characteristics (a) they achieve a higher rating on the lectures' survey questions, (b) students view the changes positively, and (c) they are affordable (the costs of implementation are within the budget of the respective institution).

Based on the FHW experience with e-assessment, in this paper, it will be suggested that four basic areas should be considered when traditional processes in higher education undergo a digital transformation:

1. Technology (proper devices and digital services),
2. Organisational structure (time slots, data security, transparency of the process, etc.),
3. Information Communication Technology (ICT) literacy of students and teachers, and
4. Design and adaptation of teaching materials to digital formats.

Hereinafter a closer look will be taken at these four areas focusing on the possibilities of improvements for e-assessment processes.

5.1 Digital Technology

Although technologies are the foundation to enable e-assessments at a first stage, this paper focuses on examining the options higher educational institutions have to improve the assessment process. This includes investigating didactical and structural options, which could help the e-assessment process change into a more accessible and welcoming practice.

Nevertheless, technological solutions also need to be considered and analysed regarding their pros and cons and whether they are affordable. For the purpose of this paper, this research paper focuses on how the FHW deals with the demand on technical solutions.

Due to the constant development of new digital technologies and services, it is a challenge to keep up to date on all trends and innovations. Consequently, the FHW instituted the Competence Centre for E-Learning, which also has the duty to stay current with new developments and better understand students' and lecturers' needs regarding digital technologies. It also supports teachers at FHW in the conception and implementation of different teaching and learning formats, developing future-proof learning opportunities, and promoting the acquisition of the necessary skills with media-didactic supply.

For the transition to widespread distance learning during the first weeks of the pandemic, the Competence Centre for E-Learning also provided various recommendations in addition to ongoing support and advice for internal and external lecturers. Multiple levels of experience with online tools led to different recommendations so that each lecturer could identify their ideal option.

In addition, the Competence Centre for E-Learning set specific measurements adapted to the situation, a Covid-19-specific Moodle Help Course, a weekly Distance Learning Q&A session, co-moderation for live online teaching, early roll-out of the Panopto video system, and guides for online exams. Furthermore, internal projects aiming at the digitalisation of communication also collaborated to keep this institution up to date with the latest developments on digital technologies.

Currently, the digital learning environment at the FHW is based on (a) Moodle as a central learning management system; (b) Zoom – in use for synchronous distance learning units since 2020; (c) Panopto as the (learning) video platform, which was made available to students thanks to a Moodle integration; and for the creation of shared documents, both lecturers and students can use (d) Microsoft 365.

Considering technology issues from a student's perspective, the goal of educational institutions should be to embrace inclusive and affordable technologies, which contribute to equal chances for all students in terms of attendance and participation in classes. However, a certain level of digital proficiency is a requisite to engage in a course of study at the FHW. After all, "digital media are increasingly determining our everyday lives. Technological developments are constantly enabling new products and services. Today, digital media education and the acquisition of digital media skills are therefore not only a requirement for continuing education but turns out that being comfortable with digital technology could be a lifelong task." (Rohs, 2017, p.203)

5.2 Organisational Structure

During the conducted survey, instructors were able to report any concerns that were important to them regarding e-assessment. In this context, there were complaints about the amount of time and effort needed to prepare and realise e-assessment sessions. In fact, the preparation of an e-assessment session requires more groundwork than traditional assessments.

Usually, traditional assessments require attention to the context of the course, the workload of students, the availability of adequate rooms, the alignment with learning outcomes and reasonable time slots. However, by planning an e-assessment, one also has to consider the physical distance and the - for lecturers and instructors - inaccessible student's environment, where students take the exam. Finally, different modalities to verify

students' knowledge, and technological requirements must be considered. (Weleschuk et al., 2019, p.11) In summary, the preparation of online assessments is similar to those for online courses:

"Online courses tend to be 'front heavy', meaning they require instructors to invest a lot of time and effort at the start of the course […]. All of [sic!] the course materials need to be prepared ahead of time, the LMS ['Learning Material System] needs to be well organised, and measures for communicating with students need to be in place before students have access. This work is necessary, as it is crucial to make sure all information is easily accessible to students throughout the course […]." (Weleschuk et al., 2019, p.9)

Ashley Weleschuk, Patti Dyjur, and Patrick Kelly compiled a guide for Online Assessment in Higher Education in which they listed some general recommendations for online assessments. Among various ideas, they recommend lecturers and instructors to start planning and designing assessments early, provide students with clear and complete instructions and expectations, reserve a time slot for students to ask questions, use a variety of assessment types and allow students the opportunity to demonstrate their competencies in different ways as well as to provide students specific, detailed feedback. In this context, it would also be essential to pursue a contingency plan for submitting or completing assignments in case of technology issues. (Weleschuk et al., 2019, p.11)

Nonetheless, because students can access e-assessments from anywhere, some institutions are reluctant to implement e-assessments for examinations (Appiah/Tonder, 2018, p.1456). A possible approach to dealing with these insecurities is to strictly follow the recommendations of the European and Austrian General Data Protection Regulation. At the FHW, this means that decisions on new procedures or software must be first audited by the IT and the Legal Departments. For instance, this process impeded the FHW in implementing online proctoring right away. If the data issues were not clear, the FHW had to get along with other monitoring solutions.

Online assessments also require a fundamental shift in the procedures of verification of students' acquired knowledge. Typical knowledge-seeking questions asked in an online context (with no control of the physical environment of the students) could distort their performances during the examination. That is why the FHW lecturers were urged to adapt the assessments to verify students' competencies rather than their knowledge.

5.3 Information Communication Technology (ICT) literacy

Although one cannot foresee which digital tools will prevail in the educational sector, dealing with digital literacy in schools or adult education means "reflecting on what personal and social structures will be suitable for the construction and organisation of knowledge in the coming years." (Calvani, 2010, p.158). That implies that dealing with digital literacy in higher education institutions also means engaging in pedagogical issues. In general, students at Universities of Applied Sciences have usually reached their age of majority. Some of them already have years of working experience. That is why this paper focuses on the methods and issues involving adult education.

There are three central didactic principles for dealing with adult education the focus on the target group, the focus on the course's participants, and the focus on the participant's biography (Rohs, 2017, p.226). Therefore, the pupils and their various experiences and competencies acquired during their lives should be implemented into the teaching approach.

Regarding digital competencies, there is an understanding that the younger, so-called "net-generation" is more competent in digital media use than the older generation. In this context, Prensky (2001) distinguishes

between the so-called digital natives, the generation that has grown up with digital media, and the digital immigrants.

However, empirical studies on the digital competencies of young people clearly state that, usually, they are not proficient in the digital aspects of their devices, neither technically familiar with the hardware or network systems nor can they code. Despite these insights, the assumed generation-specific media experiences and practices seem to influence forms and styles of acting towards new technologies (Rohs, 2017, p.227).

The younger generations differ significantly from the older generation, especially in the frequency of using digital services and devices and their openness to new technologies. Digital products and services themselves can pose obstacles to the seniors' use of digital facilities. However, differences in usage are also influenced by education, socioeconomic factors, and living environment. (Siebert, 2017, p.138)

Information and Communication Technology (ICT) literacy involves more than just access to the internet and the consumption of social media content. According to the Educational Testing Service's (ETS) report on Digital Transformation, Information and Communication Technologies literacy is "Using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information in order to function in a knowledge society." (Educational Testing Service, 2002, p.16)

5.4 Design and adaptation of teaching materials to digital formats

To support the benefits of e-assessment and prepare students for the demands of digitalisation in their daily work, students and lecturers should be familiarised with modern digital tools and methods. Therefore, the structure and design of assessments should be revised as well as the design and implementation of digital content in the classroom. The challenge is to create learning materials that link technological and content-related topics together with knowledge of digital communication and critical thinking. In addition to the specific teaching of specialist knowledge, the materials should aim to support a sustainable improvement of the students' competencies and methodological skills. Furthermore, there should be a focus to promote independent critical thinking, a willingness to discuss, and problem-solving skills in students. New developments in the field of digital tools should be integrated over the course of time – but only after considering whether they might contribute to the didactical goals of the specific institution.

Taking into consideration that subjects that include the use and/or the understanding of digital technology constantly change their content and technology focus, the adaptation of teaching materials to current formats and media must adjust to new, faster procedures. In the field of software development, agile methods are revolutionising the way of working. In literature and practice, there are already suggestions on how the insights of agile working could be implemented into the educational system (Kamat, 2012; Krehbiel et al., 2017). For instance, in agile processes, the collaboration between the development team and the client is essential. In higher education institutions, closer working between teaching staff, students, and the industry (possible future employers) could accelerate and improve the process of adapting teaching material to the respective current demands (Kamat, 2012, p.231).

Agile principles such as continuous feedback, learning from the previous iterations, and improving the next steps could help keep teaching materials up to date. Regarding e-assessments and regular assessments, Krehbiel et al. (2017, p.97) state that "as educators, we should strive to use assessment primarily as a tool to advance student learning and student mastery of disciplinary knowledge and skills. We should aim to move students from a short-term focus on doing what is needed to achieve a grade to a longer-term focus on how course material can be applied in each individual's future endeavours."

Digital technologies have surely contributed to the implementation of continuous assessment, which praises frequent assessments as a feedback mechanism to ensure students are properly aligned with the learning process. Related to the continuous assessment concept, embedded assessment emphasises the context in which the assessment is delivered. This includes assessment techniques and technologies such as clickers, in-class polls, 1-minute papers, tablet-based activity monitoring, etc. (Gary/Xavier, 2015). Both assessment varieties can be well adapted to agile principles and e-assessment methods.

6. Conclusions

Fast changing times require adaptation skills and also creativity and innovation. The COVID-19 pandemic has put educational systems and students through a tough test. However, at the same time, opportunities and new horizons have emerged. With the experience throughout the pandemic educational institutions now have the chance to change their processes for the better. Answering the research question, this paper's intention is to contribute to improvements in e-assessment methods and processes.

As demonstrated in the present paper, the results of students' and lecturers' surveys have offered the following insights:

(1) A greater amount of work for both students and lecturers could be observed during Online Learning. Especially lecturers mentioned challenges due to the additional work obligations. Because of that, it is recommended to have one central entity coordinating and guiding Online Learning for lecturers at a specific higher education institution or University. The eLearning Competence Center at the FHW showcases how well such a collaboration could work.

(2) Based on the principles of agile methods, which focus on fast adaptation due to the current work or study environment, it is recommended to constantly include students' feedback when preparing e-assessments. There is a need to be flexible and tolerant to keep up with the constantly changing environments.

(3) Rather than focusing on creating a fictional situation that simulates local presence during e-assessments (e.g. proctoring), learning from the actual environment and situation is recommended. Furthermore, there is a need to create new concepts which work for students and institutions rather than rebuilding an environment that does not match the reality of students.

(4) Finally, an attempt should be made to move away from the traditional and (maybe) more conservative approach of standard knowledge query to a more competency-based knowledge. That also includes promoting out-of-the-box thinking, critical thinking, and link-building thinking competencies.

Reflecting ongoing e-assessment practices during the COVID-19 pandemic and linking them to ongoing trends in the industry has brought insights that can contribute to an optimisation of e-assessment processes. Learning from these 'emergency solutions' and implementing them as 'long-lasting solutions' into online learning education strategies in the future, these examples are just a starting point for a much bigger discussion which could only be slightly touched in this paper.

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Experience with an Online Assessment in a Lecture about Fundamentals of Electrical Engineering

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Abstract

This contribution summarizes some experiences with a summative assessment or preliminary examination in a two-semester engineering course. An online assessment with numerical or multiple-choice questions was chosen, which required an elaborate preparation, especially in question design, but reduced the correction effort enormously. This investment is worthwhile for larger groups of more than 50 to 100 students. In contrast, online assessments with such simple question types cannot map and test all competencies that are possible via handwritten assessments. Therefore, other types of formative assessments such as personalized assignments with anonymous peer review for rapid feedback should be used along the semester. Another experience is that students cannot have enough information about the upcoming innovative online assessment, especially those with little experience in such formats to prevent ambiguity, queries, and frustration. Therefore, the same learning management system, similar types of tasks, the same input interface, and comparable scoring algorithms should be used for the summative assessment as along the whole semester. During the assessment, students should have multiple, low-threshold, redundant opportunities to ask questions, if possible (e. g., via a videoconference meeting, by phone, by email). The fear that students would perform much better in pure online assessment or that it would be much more difficult to evaluate their individual performance due to the usability of the Internet, numerical calculation tools or circuit simulation programs as well as the possibility of communication via online media, has not been confirmed, because the average score was very comparable to previous assessments in presence.

Keywords: online assessment, Moodle, electrical engineering, open-book exam, open-web exam

1. Background and Motivation

In the two-semester course “Fundamentals of Electrical Engineering”, there has been an assessment or practice exam in the middle or at the end of the semester since a couple of decades. In the past, the goal was to prepare the students for the actual exam in a certain exam situation with similar, exam-type tasks, to give semester-accompanying feedback on the level of competence and, of course, perhaps also to reduce the failure rate in the actual exam.

Due to the Corona pandemic, the assessment could not take place in attendance in December 2020 as planned, but was postponed to January 2021 to allow more preparation time. Since a format with many numerical value tasks and few multiple-choice questions was planned that required very little correction effort, this was also not expected to cause a major delay in reporting the practice certificates to the examination office. Instead of proctoring the students during the exam, we decided for an open-book assessment Swart and Sutherland (2014) with competence-oriented tasks.

2. Preparation

Of course, we already had a few thoughts and collected first ideas during the semester, but only really found time for the preparation of the online assessment shortly before the deadline. Based on some old additional tasks, some tasks from colleagues at other universities and some newly designed tasks, we put together a test in our learning management system Moodle Cole (2005). The procedure was as follows:

- find a suitable task (solid entry level, solvable in as few steps as possible and with little derivation effort, because these cannot be evaluated anyway)
- develop a sample solution, check the solution effort again
- write down the task and solution outside of Moodle (we use LaTeX source code in a Subversion repository for this purpose.)
- convert the task text into HTML format, which takes some effort with formula characters, mathematical expressions etc.
- convert the solution into an answer formula, generate randomized input values
- think about a meaningful feedback, e. g. with a link to a Wikipedia article, which gives hints to correct solution
- create the question in the question catalog of the Moodle course
- transfer the questions from the question catalog of the Moodle course into the actual Moodle test
- protect the test with a password and forward it to suitable colleagues for testing.

We also created a test assessment with a few similar questions in the Moodle course and forwarded it to the students including short information about the procedure of the planned real assessment.

The feedback from colleagues on the actual assessment, which arrived after a few days, was then extremely valuable to:

1. find typos and ambiguities in the wording, which were caused by a certain own operational blindness
2. to estimate a realistic amount of time needed for the solution

In the week before the assessment, we then reminded students several times in the online lectures about the assessment date, explained the procedure, pointed out the trial assessment, and answered questions about "what happen when …".

About a day before the assessment, we then "armed" the test in the Moodle, i. e., removed the password, limited the number of attempts to one, and restricted the access period and completion time.

3. Announcement

About one day before the assessment, we again informed the students with the following text again about all details.

> *Dear students,*
> *as discussed in the online plenary today, here is all the information about tomorrow's assessment. The assessment will be conducted as an online test via Moodle and will include various numerical and multiple-choice questions.*
> *Access link:* `https://elearning.ovgu.de/mod/quiz/view.php?id=xxxxx`
> *The online assessment will be available on Wednesday, January 20, 2021, between 7:00 pm and 9:00 pm. However, the completion time only is limited to 1 hour and 30 minutes, leaving 30 minutes buffer for any technical issues. You will have one allowed attempt for the solution to answer all nearly 30 questions. All participants get the same questions, but in different order and with different numerical values.*
> *Randomizing the order may separate similar subtasks from related task types. Therefore, it is useful to note down intermediate values to avoid multiple identical calculations, because the numerical values are always the same for these related subtasks.*
> *To prevent guessing the solution, the tolerance for the numerical values is set to* ± 1 *%, so you should not round too much.*

In total, a maximum of 30 points can be achieved in the assessment. Admission to the examination is granted if a total of 40 points is achieved in both the online assessments and all additional tasks.

Practically all aids (scripts, formularies, online encyclopedias, exercise materials, simulation tools, etc.) are permitted for the online assessment. Communication via online media is also not prohibited.

The only limiting factor is the processing time. Therefore, it is recommended to describe an A4 sheet with your own selection of formulas in preparation. In addition, a classic scientific calculator as well as pens and notepads may be recommended.

Registration for the assessment is not required.

A trial assessment with some sample questions is available.

During the online assessment, technical support is available through the GET office hours zoom meeting (`https://ovgu.zoom.us/j/91829526001`, password: xxxxxx) and by phone at 0391-67-52195.

Please make sure that during the online assessment:

- *to be in a place with the most reliable internet connection possible*
- *charge the battery of a mobile computer beforehand or operate the device on the power supply unit*
- *perform any operating system updates beforehand or deactivate them temporarily.*

Finally, I wish you a lot of fun and success with the tasks!
Best regards, Mathias Magdowski

4. Implementation

About 30 minutes before the exam, the examiner then drove from his home office to the actual university office to be available in the Zoom meeting with a more secure internet connection and a web-independent landline via his office phone number. The examiner could have also done the Zoom meeting from his home, but didn't want to reveal his home office phone number. Unfortunately, the university does not offer any office cell phone accounts.

Just under 10 minutes before the online assessment started, the first students dialed into the Zoom meeting, looking (in the "fear of missing out") to see if there was some important last-minute information there. We simply referred to the link to the online assessment and wished them good luck, whereupon the students left the meeting.

At the beginning of the online assessment, we also anxiously looked at the display in Moodle to see if the test was activating on time and started to share some initial experiences on Twitter along the way.

After 10 minutes, the first students came forward via Zoom, clicking through all the questions and now wondering why they couldn't answer them. We deleted the respective attempts and the students started again.

There were further queries, e. g. on how to deal with rounding errors or how to interpret mathematical expressions, but these were all quickly resolved via Zoom, over the phone or by email. Somewhat confusing from a student perspective was, for example, the presentation of rounding errors that were too severe. A typical problem is shown in Fig. 1.

In the middle of the processing time, there were some questions whether it is possible to return to previously unprocessed tasks, which we answered in the negative. Some students then decided to have their attempt completely deleted by us and to start anew, others decided to accept their partial points achieved so far.

At the end there were hardly any questions left, the access to the online assessment was automatically switched off by the Moodle server and all students, who had not yet handed in, had to automatically finish their attempt and hand it in.

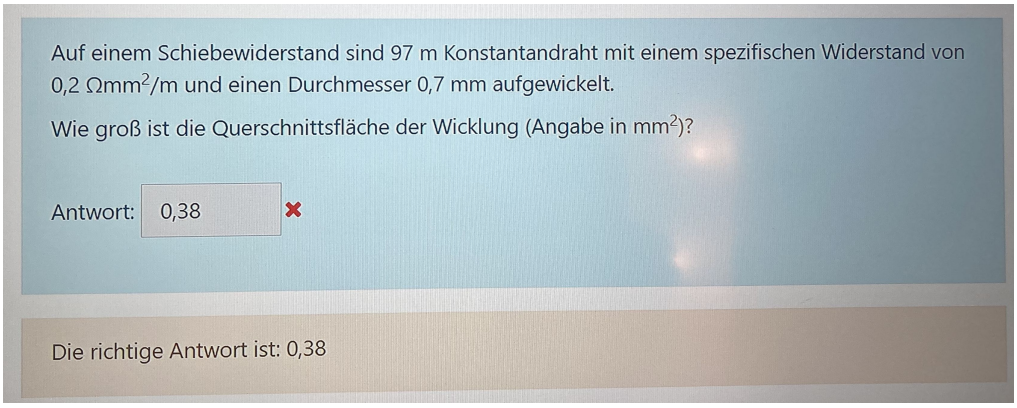


Figure 1: Example of a problem with rounding errors: How can it be that 0.38 mm^2 is displayed as wrong and yet as correct? The exact solution is $\pi \cdot (0.35\,\text{mm})^2$, or 0.384 845 mm^2. The rounded value of 0.38 mm^2 entered by the student has a relative error of 1.26 %, which is just greater than ± 1 %, and thus is not accepted. Unfortunately, the display of the correct result in Moodle itself is too rounded. But this is only a problem of the display, internally it is calculated correctly.

5. Follow-up

One of the key advantages of electronic tests with randomized number-value and multiple-choice questions is the quick, because automatic, correction and direct feedback to students. Immediately after the online assessment, we were able to export the total points from Moodle, combine them with other additional points and report the corresponding certificates to the examination office.

A little bit problematic is that you can export a table with the test results but without matriculation numbers or a table with matriculation numbers but without test results. The connecting element of both tables, however, is the unique e-mail address of the students, so that they can be linked in a spreadsheet using the `VLOOKUP` function in typical office products.

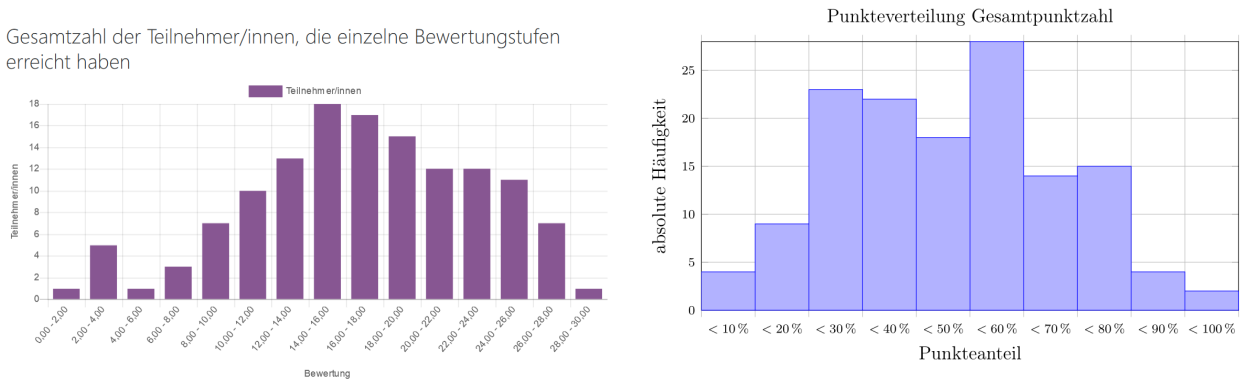
In addition, we will still distribute a small evaluation with the total point distribution to the students, possibly also create a video of it, in which we solve the tasks and explain them briefly, because in our opinion, the tasks are “burned” anyway at least for the next semester.

6. Evaluation and outlook

The main experiences and lessons learned are:

- Online assessments with number-value-and-unit or multiple-choice questions require some preparation, especially in question design, but reduce the correction effort enormously. From our point of view, it is worthwhile from about 50 to 100 students.
- Online assessments with number-value-and-unit or multiple-choice questions cannot map and test all competencies that are possible via handwritten assessments. Therefore, one might want to have other semester-long assessments such as personalized assignments with peer review in the portfolio.
- One cannot inform students, especially those with little experience in such assessment formats, often and intensively enough about the upcoming online assessment format to prevent ambiguity, queries, and frustration.
- In this sense, a trial assessment for students on the same platform, with similar types of tasks, the same input interface, and comparable scoring algorithms is a very good idea.
- During the online assessment, students should have multiple, low-threshold, redundant opportunities to ask questions, if possible (e. g., via Zoom meeting, by phone, by email).

- The fear that students would now perform significantly better or that it would be much more difficult to evaluate their own performance due to the usability of the Internet, numerical calculation tools such as MATLAB/Octave The MathWorks, Inc. (2015) or simulation programs such as LTspice, as well as the possibility of communication via online media, has not been confirmed, because the distribution of the total number of points is very comparable to previous performance assessments in presence, see the comparison in Fig. 2.



(a) Point distribution of the online assessment on 20.01.2021

(b) Point dist. of the face-to-face assessment on 11.12.2019

Figure 2: Comparison of the distribution of the total number of points between a novel online assessment and a classical face-to-face assessment in the course “Fundamentals of Electrical Engineering”

Due to these advantages, we will not return to a classic face-to-face assessments even after the restrictions due to the Corona pandemic, but will continue to use the online format, even if this requires new questions in each case.

For the further development of the format, however, a joint evaluation with the students is necessary, e. g. in the form of an evaluation with a questionnaire, by means of interviews or through informal discussions. For this purpose, we would be particularly pleased to receive student feedback.

In addition, it would be desirable for teachers to exchange information about suitable question formats across university boundaries, to maintain common question catalogs, and to review each other’s work in order to arrive at good test content with a manageable amount of effort. Of course, this requires an overarching organizational and networking effort as well as appropriate technical exchange platforms.

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Authors Index

Aggelopoulou, D. 364
Aguiar, C. 461
Aksen, A. 244
Alchatzidis, D. 476
Alevriadou, A. 293
Alvarez, I. 130
Artemi, E. 253

Bastos, G. 172
Bernd, M. 232
Beust, P. 244
Bidarra, J. 120
Bottin-Rousseau, S. 150
Bracque, V. 244
Bègue, A. 244

Casey, E. 119
Castro, M. 316
Cendon, E. 172
Chartofylaka, T. 351
Correia, M. 81
Correia, N. 461
Cosgrove, A. 264, 445

DAKOPOULOU, A. 305
Delaballe, J. 244
Dennis, C. 130
Duffy, J. 445
Díaz Casás, V. 415

Efstathopoulos, E. 364
Ehlers, U. 217

Feldmann, G. 516
Feliz Murias, T. 71, 162
Feliz-Ricoy, S. 71
Ferrier-Barbut, E. 431
Firat, M. 172
Francis, E. 191

García-Loro, F. 316
Giaouri, S. 293
Ginty, C. 2, 264, 445
Giossos, I. 351

Göllner, S. 232
Günes, A. 172

Hendrawan, B. 108
Hiltunen, L. 172
Hülsmann, X. 378

Ikonen, H. 494

Jaworska-Oknińska, M. 476
Junker, A. 378
Juutinen, S. 172

Kafentzis, G. 20
Kalavrouziotis, I. 184
Kalu, N. 280
Kananen, P. 172, 201
Kantirou, M. 386
Karachristos, C. 461
Karapanagioti, H. 184
Karipi, S. 293
Karousos, N. 364
Kelly, M. 119
Killoran, B. 2
Kiviniemi, A. 201
Korkealehto, K. 424
Korovesis, A. 364
Kourbetis, V. 293
Koutsouba, M. 351
Kullaslahti, J. 424, 494
Kunze, K. 217
Kyriazis, C. 338
Kytölä, L. 201

Laitinen-Väänänen, S. 494
Liapis, A. 364
Lorenzo Pérez, V. 162
López-Rey, Á. 316

Magdowski, M. 531
Manousou, E. 351
Martin, S. 316
Mavroidis, I. 351
Michałowicz, B. 476

Michou, V. 431, 476
Misirlis, N. 108

Naya Varela, M. 415
Nirina, A. 150
Nykopp, M. 201

O Brien, E. 331
O'Ceallaigh, T. 331

Pacholak, A. 476
Palermo, R. 96
Passos, D. 293
Penderi, E. 461
Pereira, L. 431
Perez Molina, C. 316
Perifanou, M. 503
Perla, L. 58
Petrogiannis, K. 461
Pradier, J. 244
Prataviera, A. 476
Protopapas, E. 338
Purser, L. 191

Quintana, B. 316

Ramsey, L. 191
Rapp, F. 262
Recio-Moreno, D. 71
Ricoy, M. 71
Rocio, V. 120
Rossade, K. 386
Rückert, F. 378

Sanches, T. 33
Sancristobal, E. 316
Santiago Caamaño, L. 415
Scarinci, A. 58
Schulze, M. 48
Sera, J. 516
Sfakianaki, A. 20
Sidor, D. 476
Siegert, I. 531
Silva, P. 81
Skehill, O. 2, 445
SOFOS, E. 142
Stavropoulos, E. 461
Stingl de Vasconcelos Guedes, T. 516
Stogias, S. 338
Stylianou, Y. 20

Taelman, H. 461
Tonar, Z. 476
Trench Bowles, N. 191
Tyrväinen, P. 494

Uotinen, V. 172

Vereschak, O. 431
Villanie, S. 244
Vinci, V. 58
VLACHOS, K. 401
Vogel, C. 262
Vorvilas, G. 364
Vázquez González, I. 162

Waterhouse, P. 130
Wysłowska, O. 461

Zarebski, M. 172
Zoras, O. 364

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