7th edition

EADTU

2023
Envisioning Report

exploring **new modes of teaching & learning**
for empowering universities

Generative AI & LLM   Microcredentials   OER
Mobile learning   **Green Campus**   Quality Assessment
MOOCs   Learning Analytics   **Remote laboratories**

1

Contents

Foreword

We herewith present to you the seventh edition of the EMPOWER Envisioning report.

The report is set up by the expert pools of the Empower programme (empower.eadtu.eu) established by EADTU to cover the latest trends and developments in new modes of teaching. Most and foremost *not* by copying on-campus education, but by using new modes of teaching and enhance education by:

- building on expertise and experience
- methodologically designed education
- well-considered digital didactics (research based)
- interaction, debate and dialogue, done synchronously and asynchronously
- activating education and engaging students

With the EMPOWER Envisioning report we aim to inspire fellow experts in innovating education by examples from practice. New modes of teaching and learning create new opportunities to enhance the quality of learning experiences on campus programmes, reaching out to new target groups off campus and offering freely accessible online courses. They enhance the quality, visibility and reputation of the institution.

They all work in all relevant areas for the development of new modes of teaching and learning. EMPOWER is further supporting individual universities by on-site expert seminars with free independent advice, onsite and online seminars, guidance for university leaders, expert panels for targeted reviews and, support for whole of institution initiatives.

In this 7th edition we cover initiatives related to: Digital Education and Skills (Chapter 1), Microcredentials-based Qualificatons (Chapter 2) and Innovating Higher Education (Chapter 3)

We are convinced the edition of the year 2023 is an inspiration for many to further innovate education and start cooperation and sharing of expertise with fellow innovators.

George Ubachs
Managing Director, EADTU

Digital Education and Skills

Open education labs for teaching practical STEM skills

Andy Lane[1]

[1] School of Engineering and Innovation, The Open University, United Kingdom

Innovative impact

There is a growing need for more science education and training in formal, non-formal and informal settings around the world. While open education can help meet this need most resources use single or simple media and primarily cover knowledge and understanding, items that can be more easily reproduced and revised. However, some resources use interactive elements, simulations and access to lab-based equipment to cover vocational skills training where the sharing is more one of access than reproduction. Accordingly, the greater investment required to develop and run such resources means few educational institutions can do so on their own unless they share the investment and/or share the costs of running such a service.

Introduction

Education and training in scientific disciplines helps underpin many sectors of the economy, particularly as scientific and technological innovations and developments continue to expand. Such education and training goes beyond the provision of professional scientists, technologists and engineers to the appropriate education and training of most workers and citizens who have to increasingly understand and interact with these scientific and technical innovations and developments. To meet this ever changing need requires a multi-faceted approach that goes beyond the capacity of formal tertiary education systems, especially in developing economies.

Online resources and courses
While there has been much effort put into open educational resources (OERs), to help build capacity through many funded projects in higher education institutions, their use and perceived value around the world is sporadic and contested. Related online education developments such as Massive Open Online Courses (MOOCs) have gained more popular attention while access to the internet in

general, and to OERs in a native language more specifically, can be very restricted in many countries due to the poor state of the telecommunications infrastructure and relatively high data costs. MOOCs may be open to and free to study by many learners (although many now can incur fees of some description) but the content does not always carry an open license allowing educators to freely reuse, improve or repurpose it. This highlights the practical, legal, and financial tensions between the supply of affordable and accessible education and training through reputable sources and the demands of citizens, employers and others for such education and training. This is turn touches upon the organisational arrangements that facilitate the use of OERs by both learners/students and educators/trainers, including who produces and who hosts them.

OERs for science education and vocational training
OERs offer differing benefits to learners and educators of scientific and technical subjects, depending on the nature of the OER themselves and the context in which they are deployed. Most OERs are simply text and images (as in printed or digital books, online articles, or

online slide sets) or sound and images (as in online videos). Even when online OERs uses a greater mix of media they are predominantly examples of one to many communication covering knowledge, understanding and related cognitive or general practical skills such as critically reviewing evidence and appropriately communicating findings. These OERs possess limited interactivity in themselves and usually only provide peer communication when part of an organised course.

It is possible to add some practical skills education or training to such courses by providing toolkits and guidance for how to identify things that people might be able to access themselves, such as visiting the countryside to do the equivalent of field work (Alston et al, 2022). An example of this is Practising science: Reading the rocks and ecology course on The Open University's OpenLearn platform. The course content includes details on geological fieldwork and guides learners how to make and use field sketches and interpreting geological exposures. While it is possible to teach how to do practical tasks using items that the learner has to find for themselves, and has long featured in distance teaching, there is no feedback to the learner on what they do and assumes that they can easily access the sites or items needed for the practical task.

The Open University has also over the years provided home experiment kits as part of a taught module. In the past this has included providing bespoke chemistry sets, microscopes with slide samples to investigate, and meters for measuring noise pollution. Through such equipment students were able to practise different types of observational and sometimes manipulative skills at home or near their home in the same way that campus based students are able to do. However such kits can be expensive to develop and maintain if they are not disposable but need to be returned and reused.

Bespoke open educational resources

An alternative to visiting a field site or a laboratory or sending a student pre-designed kits is to provide a simulated experience of the said kit or enable remote access to lab-based facilities which contain the kit, or even more sophisticated kit that would not be generally available to people. An example of this on OpenLearn is an interactive resource enabling learners to 'Explore Moon rocks collected from the first Moon landing'. This uses a virtual microscope which has an interface that simulates what would be seen through a real microscope along with many photographs of specimens that can then be investigated using the interface provided (Argles et al, 2017). While learners have not produced the samples themselves, they can still do everything else that might happen in real lab with a real microscope, including using different magnifications and using filters for different light sources (e.g., polarised light) and so on. This interactive OER was first developed in 2012 by several partner institutions including The Open University and there have continued to be new collections of resources added to the Virtual Microscope site.

Another more recent example is the development of a mobile environment for acquiring practical knowledge and skills of network engineering (Mikroyannidis et al., 2020). What both offer is a digital simulation of equipment to examine pre-set physical phenomena rather than working with analogue equipment to examine potentially more variable physical phenomena. While a full simulation is ideal it is also possible to provide a hybrid approach using interactive screen casts. In this case all possible experiments using real equipment are filmed that enable a remote user to change settings or try out different options to see what happens, at the same time providing built in feedback on the outcomes of the options chosen. An example of this is the Elementary Flame Test on The Open University's Open Science Laboratory (you will need to register on the site to access it, but this is free).

Remote (and open) labs

Giving student access to remote laboratories and even observatories is more challenging but effective, given Brinson's (2015) findings demonstrating that student learning is equal or higher in virtual and remote labs versus traditional labs across all learning outcome categories (knowledge and understanding, inquiry skills, practical skills, perception, analytical skills, and social and scientific communication). In principle such findings should encourage educational institutions to

collaborate to share the effort and costs of virtual and remote laboratories.

The Open University has a collection of Open STEM Labs (comprising the Open Science Laboratory already mentioned plus the Open Science Observatories, Open Engineering Laboratory, Open Health Laboratory and Open Computing Laboratory) which have been developed through external grants and The Open University's own resources. This investment can be justified because the individual activities in the various labs are used by hundreds, if not thousands of students per year over several years. Unfortunately, many are only available to registered students, unlike some of the interactive simulations which are open to all users. Only a few are also openly licensed and so can be considered as full OER. However, The Open University does licence the use of these facilities to other educational providers, a service that became more popular during the Covid-19 pandemic as regular student access to physical laboratories was restricted, and as seen with the virtual microscope there can be many benefits of sharing effort, and not just in developed economies.

Conclusion

The ever-increasing capabilities of digital technologies means that simulations of experiments and remote access to real laboratory (or even industrial scale) equipment is possible to enable practical skills development and allow for in built feedback to the student/learner. However. the high capital and running costs of some of these services means that very few are available to any learner rather than registered students. The sharing of effort and costs between several institutions offers scope for scaling up the offer and possibly making them more openly available. The continued advances in extended and virtual reality and artificial intelligence software may also help but as ever the current economic model of supporting OER production does not provide an incentive to make practical skills-based science teaching materials available at scale to individuals, teachers, or other institutions.

References

Alston, P.; Gleave, T.; Hirst, M. and MacQueen, H. (2022). Online Science Education at Scale: Open and Distance Learning, MOOCS, and Other Learning Assets for Theory and Practice. In: Witchel, Harry J and Lee, Michael W eds. Technologies in Biomedical and Life Sciences Education. Methods in Physiology (METHPHYS). Switzerland: Springer, Cham, pp. 383–416.

Argles, T. W.; Brodeur, M. and Braithwaite, N. St. J. (2017). Delivering authentic online practical science teaching – geoscience perspectives from the OpenScience Laboratory. In: International Geological Congress, Abstracts, 35, article no. 2682.

Brinson, J. R. (2015) Learning outcome achievement in non-traditional (virtual and remote) versus traditional (hands-on) laboratories: A review of the empirical research. Computers and Education, 87:218–237

Mikroyannidis, A.; Gómez-Goiri, A.; Smith, A. and Domingue, J. (2020) PT Anywhere: a mobile environment for practical learning of network engineering, Interactive Learning Environments, 28:4, 482-496

Project IDEAS: An Innovative Digital Education and Skills Approach

José Bidarra[1,2], Isabel Carvalho[1,2], Ana Paula Afonso[2], Lina Morgado[2], Antonieta Rocha[2]

[1] Universidade Aberta, CIAC
[2] Universidade Aberta, LE@D

Innovative impact
The Innovative Digital Education and Skills (IDEAS) Project is an ERASMUS+ project involving four European countries (United Kingdom, Malta, Denmark, and Portugal), aiming to improve teacher digital skills and competences through a 30-hour microlearning teacher training course. The output consists of bite-sized modules using adaptive learning models enabling teachers from any curricular area of Vocational Education & Training or Higher Education to increase their digital competences and skills. It is supported by a personalised training package with support from specially trained IDEAS Mentors. The project follows the EU's Digital Education Action Plan (2021-27) Strategic Priority 1: "digitally competent and confident teachers".

Keywords: teacher training, microlearning, digital skills, adaptive model

Introduction

The IDEAS project represents an opportunity to upskill teachers by improving their digital competences and developing the organisation's capacity, namely by facilitating innovative learning experiences which will, ultimately, positively impact learners. It is based on a literature review and a needs analysis that was conducted through an online survey (assessing 99 teachers' strengths and weaknesses in using digital technologies in education). The following gap analysis of the survey answers identified 4 main areas of digital competence in which teachers felt they needed training:

- technical;
- communicative/collaborative;
- afety/accessibility;
- pedagogical.

The instructional design of the course was framed by a 'learner persona' also profiled from this analysis. A pilot teachers' training programme to test the functionality of the e-learning platform, design, quality, and impact of the content and educational resources was implemented.

The recent COVID-19 pandemic revealed the lack of preparation of teachers to successfully adopt digital transformation into their professional and teaching practices, thus putting into evidence the need for digital education programs to promote and develop digital competences among teachers worldwide. We consider this to be a core issue regarding the preparedness of teachers (or the lack of it) in the post-pandemic context.

IDEAS Framework
The DigCompEdu (2018) establishes the digital skills and competences educators need in contemporary teaching environments. The framework is structured by a total of 22 educator-specific competences for teaching, within 6 main competence areas:

- Area 1 - professional environment;

- Area 2 - sourcing, creating and sharing digital resources;
- Area 3 - managing and orchestrating the use of digital tools in teaching and learning;
- Area 4 - digital tools and strategies to enhance assessment;
- Area 5 - the use of digital tools to empower learners;
- Area 6 - facilitating learners' digital competence.

However, the use of digital technologies in education presents several challenges concerning digital poverty amongst students, namely, access to reliable technology (internet, hardware, software) impacts their ability to participate effectively in their learning. Therefore, a key objective of this project is to address some of the practical issues around equity and inclusivity. Also, online learning plays an important role in the pursuit and achievement of the Sustainable Development Goal 4 (UNESCO, 2019), which aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

In this context, the IDEAS Pedagogical Framework was developed as a model of self-paced learning with peer support and guidance, framed by the concept of a Continuing Professional Development Academy, and supported by an online Virtual Community of Practice and a Mentorship program. It provides resources and suggestions for ongoing professional development to help teachers stay current on best practices and improve their teaching skills. It's competence oriented, thus addressing the needs of (VET) teachers and recognising the gaps in their digital pedagogical skills. It relies on the combination of online and in-person instruction to create more personalised and effective learning experiences, also providing tips for using online resources, educational apps, and digital tools to enhance teaching and learning.

Microlearning Courses
In line with the preliminary research work, the project developed a 30-hour digital teacher training

programme using adaptive learning models which enabled (64) teachers from different curricular areas of VET and HE in the partner countries to improve their digital competences and skills using a personalised training package with micro-credentials.

The teacher training programme is structured around 14 learning courses addressing the 4 areas of competencies identified by previous research results: i) **Technical area** (authoring digital content, creative digital problem-solving); ii) **Communicative/ collaborative area** (providing digital feedback, promoting networking); iii) **Safety and accessibility area** (supporting a safe, inclusive online environment, understanding accessibility issues) and, iv) **Pedagogical area** (adopting a digital assessment culture, using learning analytics for student success, designing personalized learning experiences). The learning stages of those undertaking each course is recognised through digital badges and certificates of attendance.

Participants have the opportunity to develop skills in a set of digital competences throughout the programme with the digital tools and pedagogic strategies of each IDEAS course, namely:

- Blended learning approaches
- Planning for learning
- E-assessment
- Innovation in teaching and learning
- Distance learning and online learning innovation
- 21st Century skills in learning and teaching
- The art of presentation
- Moodle advanced
- Microsoft Teams
- Digital tools for academic writing
- Accessibility
- Netiquette and E-safety
- Survey tools and polls
- The art of presentation

All the IDEAS courses have the same structure and design:

- a self-assessment quiz to start (so the learner can decide if it is necessary to complete the module or move on to another one);
- 3 to 7 content sections;
- varied learning resources (videos, text);
- formative learning activities for each section;
- a final assessment quiz (with grades);
- an extension activity/resources (for those who want to go deeper on the subject) and;
- a feedback form (for further improvement of the learning experience).

Learning content and learning activities, all together, determine a maximum of 2 hours of workload for each course.

The digital learning resources used on IDEAS vary within the courses, according to the type of resource used to introduce or present the learning topics and the learning strategy in use, for instance:

- videos, screen recordings, or voice-over PowerPoints, no longer than 5 minutes;
- reading material (pdf, text)
- infographics
- websites
- software

All the teaching and learning resources were created specifically for the courses, namely, the videos and narrated PowerPoints had the same design template (for coherence) and are available on the IDEAS YouTube channel (https://www.youtube.com/@ideaserasmusproject2542).

The LMS was provided by the partner Copenhagen Business Academy (CBA), through its *Smartlearning* Moodle based platform: https://platform.smartlearning.dk (course registration is free).

Another digital resource available in each course is the IDEAS-BOT, implemented by B&P Emerging Technologies Consultancy Lab Ltd (partner from Malta), a research, development, and consultancy company assisting businesses, organisations, and entities in the design and implementation of innovative digital solutions. The IDEAS-BOT (http://www.ideas-bot.com) uses artificial intelligence (OpenAI) to guide teacher training for stimulating, innovative, personalised, and impactful digital education. It is embedded in the IDEAS modules and provides help in 3 domains of questions: technical help, content-related help, and content-related questions.

Community of Practice

Education and training models have undergone a major change over the last decade. Models are now accepted that use diverse strategies and solutions that complement formal, non-formal, and informal education. These use digital devices and networks that support the design of peer-to-peer and horizontal learning communities, such as communities of practice, mentors, chatbots, and gamification processes of learning, among others. The IDEAS project proposes a solution supported by an online Community of Practice based on LinkedIn.

Communities of Practice, initially in the physical environment, gain new meaning when members share knowledge and gain rapid problem resolution and access to resources through the Network. They enable sharing of knowledge and best practices without the time and space limits, and allow for strong personal relationships between members who have never met personally. They may be valued by participants as relevant learning forums and finally, they should rely on a core of members who provide leadership to the community. The IDEAS Community of Practice has at the moment about 800 followers, and activities are being actively reported on a constant basis (#ideas4teachers).

Conclusion

This framework and the microlearning implementation were directed towards a practical objective within Erasmus+ Project IDEAS, namely, the development of a digital training programme to address the specific needs of VET teachers who feel that their digital competence and skills are insufficient to support teaching, learning and assessment.

Our research suggests that the impact of a successful digital transition will provide an improvement in teachers' digital skills, consequently improving their pedagogical practice, and resulting in improved learner engagement, particularly amongst less able or vulnerable students. This will build competence and confidence in their digital skills and prepare them for the shift to online/virtual/blended teaching and learning approaches in the post COVID-19 era. It is also expected that VET teachers will reflect on their professional practice and be empowered to drive their own learning and development as the tools available will guide them through a personalised training environment that is responsive to their individual needs.

Links for social media pages
https://twitter.com/ideas4teach
https://www.linkedin.com/company/ideas4teachers
https://www.facebook.com/ideas4teach

References

European Commission (2020). *Digital Education Action Plan* (2021-2027). https://education.ec.europa.eu/focus-topics/digital-education/action-plan

European Commission (2018). *Digital Competence Framework for Educators* (DigCompEdu). https://joint-research-centre.ec.europa.eu/digcompedu_en

UNESCO (2019). *Recommendation on Open Educational Resources* (OER). Legal Instruments. http://portal.unesco.org/en/ev.php-URL_ID=49556&URL_DO=DO_TOPIC&URL_SECTION=201.html

Microcredentials-based Qualifications

A microcredentials-based Postgraduate Certificate of Academic Practice (PGCAP)

Elizabeth FitzGerald[1], Julia Sargent[1], Leigh-Anne Perryman[1] and Klaus-Dieter Rossade[2]

[1] Institute of Educational Technology, The Open University
[2] School of Languages and Applied Linguistics, Faculty of Wellbeing, Education and Language Studies, The Open University

Innovative impact

This paper presents a new certificate that consists entirely of microcredentials: a *stackable model*. The postgraduate qualification was piloted extensively with staff members at the Open University (OU) and will soon become available for a global audience. The successful completion of study entitles the certificate holder to become a Fellow of the Higher Education Agency in the UK, a highly regarded first stage professional membership and a proxy for teaching excellence. We will present key elements of the programme, key steps in the approval of the qualification and initial feedback from the pilot cohorts.

Keywords: microcredentials, stackable qualification, feedback.

Introduction

There is a wealth of empirical research and practical insights that shows that well-informed and highly skilled academics are essential for successful learning of OU students. Professional development of academic staff is key for sustained innovation in teaching and learning (Hattie, 2009) and lower staff turn-over (Bartlett & McKinney, 2004). Most importantly, it has been shown to improve student retention, improve attainment of diverse groups (Nguyen et al., 2020; Richardson et al., 2020) and higher student satisfaction (Rienties & Toetenel, 2016). In particular, it is widely recognised in the sector that providing new academic staff with appropriate support, training, and development in the form of a PGCAP can help them to accelerate the transition into a new role, and allow them to "hit the ground running".

Microcredentials and the PGCAP
The geographically dispersed nature of the Open University (OU) has shaped a working culture which embraces synchronous and asynchronous remote communication as the norm, and many OU modules are taught online-only. This is also true for distance teaching universities across Europe and further afield. The COVID-21 pandemic from 2020-2021 has led campus and classroom-based universities to review their teaching models and students in these institutions have become more concerning in their choices whether to attend lectures or watch recordings asynchronously. The PGCAP (Postgraduate Certificate in Academic Practice) was designed not only to be accessible to academics in any location where internet is available, but also focuses a great deal on the concept of online teaching.

The OU has rigorous processes for the design, production and delivery of its curriculum. A formalised process requires teams of staff to consider business, governance, pedagogic, student experience, resource and work planning decisions, and both peer review and

formal approval is built into the production schedule. Given the academic and professional standards required of the OU materials, module production can take one to two years to complete. An exception to this is microcredentials (15-credit modules), which typically take around 3-6 months to produce, through an agile production approach.

There are currently 26 microcredentials on offer. The courses that make up the PGCAP form the OU's only stackable qualification, i.e. one that consists entirely of microcredentials. Four microcredentials, each worth 15 credits, lead the learner through to completion. The microcredentials are from the options available within the OU's microcredential portfolio that relate to online teaching and teacher education. The microcredentials are designed to develop reflective practitioners in the theory, research and practice of online teaching and academic practice. Each microcredential is delivered entirely online on the FutureLearn platform.

Fellowship routes at the OU
Currently the only way to obtain HEA (Higher Education Academy) fellowship at the OU – apart from going directly to Advance HE – is through the OU's Applaud scheme. This accredited scheme provides an experiential route to getting the award of AFHEA (Associate Fellow of the HEA), FHEA (Fellow of the HEA) or SFHEA (Senior Fellow of the HEA). The PGCAP provides a parallel route to FHEA status through a taught route.

The initial students on this programme were academic staff at the OU, who did not have HEA accreditation. The 15-credit microcredentials allow either AFHEA (from passing the first microdential, an early route exit) or FHEA (from passing all microcredentials). Possessing Fellowship of the HEA is considered a highly positive aspect of promotion applications at any level, as it shows that the candidate is serious about their professional development and being able to evidence their proficiency. It is also a well-thought way to demonstrate the excellence in teaching and learning that an academic – or academic-related – can have. This works particularly well on a global scale, as the HEA fellowships are recognised by several

countries and makes it possible to benchmark provision against internationally recognised quality standards.

Approval of the stackable qualification
There was a growing consensus across the OU for a need to have a systematic training approach for new academic staff in the form of a PGCAP. It provides appropriate academic professional development for new staff, an opportunity for existing staff to update their teaching and learning skills (where needed), and to align with best practice in the sector. In two papers presented to the Vice-Chancellors Executive Academic Committee (VCE-A) in 2020, there was

- approval for the course of action to accredit academic development against a standardised framework; and
- recommendation to VCE (Vice-Chancellor's Executive Committee) to support formal approval of a launch of the PGCAP.

Approval was given by the committees and the PGCAP started in 2021.

Microcredentials also follow national and international standards. For example, they are aligned with The Quality Assurance Agency for Higher Education's (QAA) Characteristics Statement for Microcredentials. This considers the purpose and context of microcredentials, and the characteristics of the learner, exploring the implications of these for a range of functions including admissions and access (e.g Recognition of Prior Learning), quality management, course design and assessment. They also meet the standards set by the Common Microcredential Framework (CMF), developed by the European MOOC Consortium. The CMF uses the European Qualification Framework (and other qualification frameworks of universities) to provide courses that are high-quality, that award academic credit.

An important aspect is what is covered by the PGCAP itself. Online teaching and teacher development are foremost: creating courses for adult learner; evaluating and improving courses; and using scholarship to improve practice. Optional courses include embedding mental health in the curriculum; accessibility and inclusive learning; and social, race and gender-related

equity. These topics are crucial to knowing how to teach in today's society and takes a very student-centred approach.

Initial feedback from pilot cohorts

How learners perceive their experience of studying microcredentials within the Open University PGCAP qualification and the challenges and affordances involved in the use of 'stackable' microcredentials within the format of a PGCAP are explored further in Sargent et al. (2023). Learners presented views related to the value of microcredentials linking theory and practice together, the mixed realities of social learning on FutureLearn and their experiences of studying the microcredentials alongside their substantive roles at the university (Sargent et al., 2023). Rienties et al. (in review) has also further explored the social networks developed through the programme exploring how and with whom educators learn.

Conclusion

Microcredentials can help introduce options for learners about what they want to study and when. They can also help set up learners for future needs, and are closely aligned with employment. They offer a flexible, targeted approach to assist learners develop the knowledge, skills and competences they need for their professional and personal development. Microcredentials can be used to study academic integrity, for example, or generative Artificial Intelligence (AI).

It is clear that microcredentials are here to stay, and a growing number of universities are using them. Lifelong learning is increasingly important and the tie-in with employment is essential. For the PGCAP, it provides a standardised way of studying for a qualification that is highly valued and seen as an excellent way to engage with other learners.

References

Bartlett, K. R., & McKinney, W. R. (2004). A study of the role of professional development, job attitudes, and turnover among public park and recreation employees. *Journal of Park and Recreation Administration*, *22*(4), 63-81.

Hattie, J. (2009). *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.

Nguyen, Q., Rienties, B., & Richardson, J. T. E. (2020). Learning analytics to uncover inequality in behavioural engagement and academic attainment in a distance learning setting. *Assessment and Evaluation in Higher Education*, *45*(4), 594-606.

Richardson, J. T. E., Mittelmeier, J., & Rienties, B. (2020). The role of gender, social class and ethnicity in participation and academic attainment in UK higher education: an update. *Oxford Review of Education*, *46*(3), 346-362. https://doi.org/10.1080/03054985.2019.1702012

Rienties, B., Calo, F., Corcoran, S., Chalder, K., FitzGerald, E., Haslam, D., Harris, C., Perryman, L.-A., Sargent, J., Suttle, M., & Wahga, A. (in review). How and with whom do educators learn in an online professional development microcredential.

Rienties, B., & Toetenel, L. (2016). The impact of learning design on student behaviour, satisfaction and performance: a cross-institutional comparison across 151 modules. *Computers in Human Behavior*, *60*, 333-341.

Sargent, J., Rienties, B., Perryman, L.-A., & FitzGerald, E. (2023). Investigating the views and use of stackable microcredentials within a Post-Graduate Certificate in Academic Practice. *Journal of Interactive Media in Education*.

Introducing microcredentials into qualification structures

Caitlin Harvey[1] and Klaus-Dieter Rossade[2]

[1]Head of Academic Projects (Microcredentials), The Open University
[2] Executive Dean WELS Faculty and Chair of Qualifications and Assessment
Committee, The Open University

Innovative impact
This innovation enabled the Open University (OUUK) to introduce microcredentials into qualification structures via a cross-institutional framework to future-proof and broaden the curriculum. The new framework enables academic faculty to include skills-focused and contemporary employment-relevant topics into mainstream study at both undergraduate and postgraduate levels. This innovation has the potential to broaden the appeal of qualifications, providing existing students with opportunities to integrate skills and employment focused learning into their awards, and enable new student groups to enter HE and progress into qualification study.

In this way, students are enriched in their learning and the University can expand into new markets and explore how to innovate in the curriculum. The long term impacts will relate potentially to the introduction of the Lifelong Loan Entitlement (LLE) in England and future policy changes across the UK nations.

Keywords: microcredentials, qualifications, framework

Introduction

The Open University (OUUK) is a distance-learning university in the UK working in all 4 nations of Wales, Scotland, N Ireland and England, as well as having global reach. The University has been established for over 50 years and is a world-leader in supported distance learning and lifelong learning.

Microcredentials are short skills-based courses designed to allow students to build professional skills and pursue further specialised study. They are particularly relevant to rapidly growing industries: they allow students to gain specialist knowledge to help advance careers and for professional growth. Upskilling with a microcredential can keep students up-to-date with relevant and emerging knowledge, skills and practices.

In the Open University microcredentials are fully online and represent 10 UK credits (100 hours) at undergraduate level or 15 UK credits (150 hours) at postgraduate level (equivalent to 4-6 ECTS as outlined in the Common Microcredential Framework and European Qualification Framework). These hours are studied over 10-12 weeks, are supported by mentors and built around a conversational learning pedagogy (Kukulska-Hulme, 2022) with one summative assessment. Some microcredentials at the OUUK are sector endorsed with Cisco, Amazon Web Service (AWS) Academy, Royal Photographic Society and Association for Learning Technology.

Currently the Open University delivers 26 microcredentials in a range of subject areas covering: (1) leadership and management, (2) computing and digital technologies, (3) environment, climate change and sustainability, (4) teacher development and

inclusive learning, (5) equality, diversity and inclusion, and (6) health and social care.

The Microcredential Framework

The microcredentials were originally established in 2020 as stand-alone curriculum products with no direct relation to the wider curriculum offered at the OU. In time, it became apparent that students could benefit from the opportunities of studying microcredentials while microcredential learners may wish to access qualification study.

The development of a Microcredential Framework at the OUUK has enabled the incorporation of microcredentials into traditional qualification structures. Eight principles set the parameters of the framework to (i) standardise the structures and characteristics of microcredentials (ii) enable microcredentials to be counted into existing qualifications and (iii) enable microcredentials to be stacked into stand-alone qualifications.

The 8 principles are as follows:
1. Microcredentials follow OU academic governance approval processes and quality assurance requirements in line with all credit-bearing OU curriculum.
2. Those studying on OU microcredentials should be referred to as 'learners' to distinguish them from OU students on OU standard modules and qualifications, and from apprentices.
3. OU microcredentials must align with the latest version of the Common Microcredential Framework (CMF) agreed by the European MOOC Consortium.
4. Microcredentials should align with a single pre-approved model for assessment and tuition delivery.
5. OU microcredential credit is OU credit and may be counted towards an OU qualification and may be used within the qualification classification.
6. OU microcredentials can be counted towards an OU qualification provided the established principles, frameworks and policies are followed.

7. OU microcredential stackable qualifications will align with specific stand-alone qualifications in the OU Qualifications Framework and associated policies.
8. The maximum total credits for an OU microcredential stackable qualification is 60 credits at undergraduate and postgraduate level (equivalent to 30 ECTS).

Principles 1-4

Principles 1-4 are designed to standardise the microcredential offer cross-institution and ensure each microcredential follows a standard set of academic requirements around approval processes, terminology, teaching frameworks and assessment.

The Common Microcredential Framwork (CMF) was set up under the auspices of the European MOOC Consortium to establish a framework for microcredentials using the European Qualifications Framework (EQF). To meet the requirements of the CMF, microcredentials "must meet the following specifications:

- Has a total workload (or study time) of 4-6 ECTS (100-150 hours), including revision for, and completion of, the summative assessment.
- Be levelled at Levels 5-8 in the European Qualification Framework or the equivalent levels in the university's national qualification framework, or be levelled at Level 5 and fulfil the criteria of the European Credit Transfer and Accumulation System.
- Provides a summative assessment that awards academic credit, either directly following successful completion of the microcredential or via recognition of prior learning upon enrolment as a student on a university's course of study.
- Uses a reliable method of ID verification at the point of assessment that complies with the recognised university's policies and/or is widely adopted across the platforms authorised to use the CMF.
- Provides a transcript that sets out the learning outcomes for a microcredential, total study

hours required, EQF level, and number of credit points earned". (EMC, 2019)

For the model adopted by microcredentials at the OUUK, the teaching and assessment models are consistent with the CMF and innovate in the areas of tuition model, study skills development and assessment. Assessment builds towards a practice-informed final assessment point, tuition and learning build on the conversational learning pedagogy and study skills are focused around the specific learning outcomes.

The introduction of the term 'learner' as opposed to student as used on OUUK traditional core courses signals these differences. Still, because credits are awarded, the same approval and quality assurance processes used for traditional courses also apply to microcredentials.

Principles 5-6
Principles 5 and 6 establish the foundations upon which OU microcredentials can be counted into OU qualifications. The fundamental principle of credit – that OU credit is OU credit irrespective of route – is key to then counting the microcredentials into qualifications and into the classification of results.

Under these principles, microcredentials can be added to existing qualifications as alternatives to existing curriculum but this is limited to no more than a third of the total credit. This limit ensures that the majority of teaching and learning has happened in the supported distance learning model of the OUUK which has proved so successful for over 50 years.

Following the established principles, frameworks and policies (Principle 6) ensure that microcredentials aren't perceived as different and they follow all established procedures. This is important for consistency and for credibility.

Principles 7-8
Principle 7 aligns a stackable microcredential qualification with the OU Qualifications Framwork which itself sits in line wih QAA Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (QAA, 2014).

Principle 8 sets the maximum awardable credit from a microcredential stackable qualification as 60 credits (30 ECTS). This is set at this maximum level because at qualification level, microcredentials don't carry the extra requirements set for OU qualifications around double-marking and therefore a maximum limit of 60 credits is deemed acceptable from a quality assurance perspective.

In this way, microcredential stackable qualifications will comprise either:
- A Professional Certificate (undergraduate)
- A Graduate Certificate (undergraduate)
- A Professional Diploma (postgraduate) or
- A Postgraduate Certificate (postgraduate)

Implementing the framework
The framework has taken a number of months to implement cross-institutionally. Checks were needed on enquirer websites, registration processes and credit awarding processes to ensure that the learning and credit earned from microcredential study were compatible with established University systems and processes. Staff training was required and ongoing support and guidance will be provided. Qualification regulations were updated and republished.

Benefits of establishing a framework
The framework has introduced a consistency of approach across levels of study and across subject areas. This has avoided a cottage-industry approach to establishing microcredentials into qualifications across the University and has enabled communication to prospective students to be clear, consistent and unambiguous.

The innovation around the framework has enabled approval processes to be faster and more streamlined which can benefit the wider University. External assessor approval has been maintained while becoming more flexible in terms of the timing of the submission of reports to meet faster production and delivery dates. The learning from these approaches will benefit core curriculum and will enable scaling up of the microcredential model in future.

Further work on defining the details of the framework is still underway, particularly in relation to

verification and awarding for stackable qualifications; however the framework can evolve over time while setting down a clear basis for future innovation.

Conclusion

The opportunity to introduce microcredentials into the qualification offer at the OUUK matched our strategic goals relating to widening reach and delivering lifelong learning opportunities.

The innovation of a new framework for counting microcredentials to qualification study has opened up new opportunities for students and delivered a rigorous and streamlined model for the University.

Over time it is anticipated that microcredentials will become standard elements of qualification study and thereby enable students to benefit from skills-based and contemporary topics of study that will benefit their learning and their future employment prospects.

References

European MOOC Consortium (2019) *Common Microcredentials Framework*
EMC_Common_Microcredential_Framework_.pdf (eadtu.eu) (accessed May 2023)

QAA (2014) *The Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies* qualifications-frameworks.pdf (accessed May 2023)

European Qualifications Framework (EQF) The European Qualifications Framework (EQF) | Europass (accessed May 2023)

Kukulska-Hulme, A. et al (2022) Pedagogies of Microcredentials, *Innovating Pedagogy Report*. IET, The Open University www.open.ac.uk/innovating

Innovating Higher Education

Turtle Lab: a web environment to design and apply experiments. An opportunity to teach experimental psychology in distance education

Maria Jose Contreras[1], Laura M. Fernández-Méndez[2] and Isabel Orenes[1]

[1] Universidad Nacional de Educación a Distancia (UNED)
[2] Universidad Rey Juan Carlos (URJC)

Innovative impact

Students' direct experience with the research procedures related to the phenomena they study in their academic subjects is a desirable strategy for undergraduate and postgraduate studies. This strategy should include the presentation of the phenomenon and how scientists have approached it experimentally under controlled laboratory conditions. However, in some degrees such as Psychology, only a small percentage of laboratories are available for introductory courses. This situation is aggravated in distance learning universities, where virtual laboratories should be used as an alternative. Shared physical spaces limit the possibilities of analyzing effects that need continuous application times. The development of innovative practical lessons is limited by a shortage of resources. In order to design experimental practical lessons, either the purchase of programming software or the use of open access tools is required, however, the latter require programming knowledge.

This project aims to facilitate the design of experimental tasks for the teaching of psychological processes through the use of an online system. With the *Turtle Lab* system (https://turtlelab.eu/), teachers will be able to create practical lessons without downloading software or learning how to program it. The system allows you to create tasks by uploading the experimental essays in image format and include instructions from frequently used documents (such as pdf, ppt).

The expected impact is the use of the platform in postgraduate subjects, the dissemination of science and professional guidance.

Keywords: teaching experimental psychology, master students, distance education, usable online system

Introduction

This paper focuses on certain priorities that are part of strategic actions within higher education. Specifically, we present a proposal for "Innovative Practices in a digital age". Thanks to a teaching innovation project, a pilot test is presented with a Masters in Research in Psychology student, to test a system that facilitates the design of open access and online experimental tasks. These "virtual laboratories" allow a more direct understanding of psychological processes and their research. It is an immersive learning environment that enhances the acquisition of research skills and resources, as well as knowledge about basic cognitive processes. As it is a free resource that can be accessed from anywhere (e.g.: your own home), the Turtle Lab Platform allows students to design the tasks and collect research data without having to go to their reference research center where their teachers work. This innovative teaching tool encourages autonomous work starting from a simple instruction provided by the teacher, and emphasizes learning through the learning through the "know how" methodology. On the other hand, as the experiments can be carried out without having to be in the physical laboratories, the

tasks can be programmed without incurring in any extra travel and accommodation costs. This objective is important because of the sustainability it offers if the student lives in a different city from that of the research directors, which is common in national distance universities, such as UNED.

Regarding the priorities of the present study, the teaching innovation project in which the development of the Turtle Lab platform is framed focuses on strengthening the relatonships between education, research and innovation and follows the recommendations of the Digital Education Action Plan of the European Commission 2021-2027 (https://education.ec.europa.eu/es/focus-topics/digital-education/action-plan).

The fact that the student has control over the tools that he/she uses in the learning process gives him/her the ability to self-regulate. This type of learning is understood from an approach in which the students take control of their own learning processes and experience, which is known as "self-directed learning", where reference is made to both personal attributes and actions of the learners as well as to the characteristics of the learning environment (Loyens et al., 2008). The degree to which students are able to regulate their own learning improves learning outcomes (Beishuizen & Steffens, 2011). In this way, those who better regulate themselves, compared to those who show worse self-regulation abilities, implement more effective strategies, monitor and evaluate their progress more efficiently, establish a more productive learning environment, seek help more frequently if necessary, dedicate more effort and are more persistent, they adjust their strategies better and establish new more effective goals when they complete the previous ones (Zimmerman & Schunk, 2008).

Turtle Lab is the evolution of a previous system, the ERMENTAL platform, that was designed, programmed and validated thanks to the FONDECYT 1151271 project ("Improving academic performance in higher education: Mental rotation training and its relationship with the structure of visuo-spatial working memory"). This online system (http://ermental.eu/) was subsequently revised thanks to the project "Cooperating for a European and Egalitarian Visuospatial Education" (UNED EUROSPACE EDUCATION REF 2019-COO-0001) in which several institutions have participated with international collaborations; UNED, University of Padova, University of Regensburg, Autonomous University of Madrid and Rey Juan Carlos University, publishing a chapter highlighting the possibilities of this type of platform for teaching the effects of cognitive training with experimental tasks (Martínez-Molina et al., 2020). However, ERMENTAL was not designed for students to design their own experimental tasks. Its main purpose resided in the fact that students could apply the tasks programmed by the teachers and this could be done from any point with an Internet connection (own home, libraries, etc.) without having to be present in the classroom. This allowed the application of cognitive training programs, with increased adherence, as students did not need to complete the training physically in laboratories. ERMENTAL also provided graphically the results of the training progression and observed the improvement in performance, which had possibilities for both, research and teaching.

At a later time, the need to expand the objectives and develop an improved platform that would also allow the training of students in the design of their own tasks was observed. Thanks to the project "Turtle Lab: portable online laboratory for carrying out Sustainable Practicals" (Ref COO-2020-0007), financed by UNED and Banco de Santander for internationalization projects related to Sustainable Development Goals (SDGs), it was possible to program this functionality. Figure 1 shows the home screen of the platform and the different types of Users. The "Super Administrator" profile would correspond to the Supervising Teacher who has access to all functions and can register "Administrators". The Administrators can also design tasks, and this is the profile with which the students, with the supervision of the tutors/directors (Super Admin) can design their experiments, which they will, in turn, apply to the participants in their studies (Participant profile), who can only perform the tasks that are assigned to them.

Figure 1. Home Screen of the Platform where access is selected according to the type of user

Figure 3. Example of a practice screen of the adapted test PERM 2.

Pilot Study with a Student of the Master's Degree in Research in Psychology

The study was carried out with the participation of two educational centers. The tasks programmed by the student with the *Turtle Lab* platform were applied to 40 students (23 girls and 17 boys) between 10-11 years of age who were in the 6th grade of Primary Education.

The student programmed the mental rotation task adapted from the training designed by Rodán et al. (2016, 2019), the PERM-2D (acronym "Mental Rotation Training Test) for Primary Education and Secondary Education. Figures 2 and 3 show an example of a training item for primary (PERM-1) and secondary (PERM-2) education, respectively, designed on the *Turtle Lab* platform.

In addition to the rotation task, the participants had to make a confidence judgment after completing each MR trial. Therefore, a confidence judgment was carried out for each completed rotation exercise. Following each mental rotation item, the participant was shown a question about their confidence in the answer they had just given to the MR test (see Figure 4) and where the participant decided on a scale of 0 to 4, how confident he/she was in the answer he/she had just issued (Figure 2). Being 0 "not at all sure" and 4 "totally sure" of his/her answer. The scale was adapted from the scale used by De Neys and Feremans (2013).
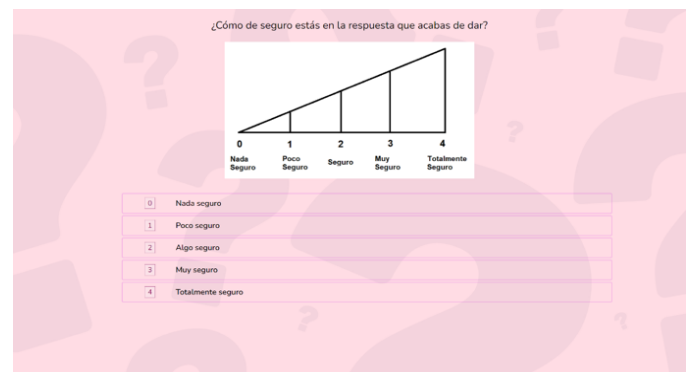

Figure 4. Example of a screen to evaluate a confidence judgment.

Figure 2. Example of a practice item screen for the PERM 1 test.

Conclusion

In conclusion, we can highlight several points from our study. In the first place, the platform allowed the student, who lives in a city other than that of her tutors, to program various experimental tasks and apply them to children from two primary educational centers in her town of residence.

This made it possible to comply with the data collection of her Master's degree in research in Psychology, with advances in the field of study. The data collection allowed to conclude advances in the research topic and for the field of study. The relevant conclusions, thanks to the experimental application, were: 1) at these ages, boys and girls still do not know how to calibrate their level of confidence regarding the difficulty of a task, as they have the same confidence about the answer they have just given. regardless of the difficulty of it; 2) a sex effect was found in the confidence judgment for the easiest task (PERM 1), where boys obtained a higher confidence score than girls, however, no significant sex differences were found in the performance of the mental rotation tasks, nor in the other cognitive abilities evaluated in the study; 3) mental rotation is related to other cognitive skills such as abstract reasoning and numerical aptitude, just as these are in turn related to verbal aptitude.

Therefore, the use of the platform has allowed the development of experimental work in Psychology and compliance with the programming and application of experimental tasks with distance teaching, for the development of a Master's Thesis in Psychology Research at UNED.

Funding

References

Beishuizen, J. & Steffens, K. (2011). A conceptual framework for research on self-regulated learning. En R. Carneiro, P. Lefrere, K. Steffens & J. Underwood (Eds.), *Self-regulated learning in technology enhanced learning environments: A European perspective.* Rotterdam: Sense Publishers.

De Neys, W., & Feremans, V. (2013). Development of heuristic bias detection in elementary school. *Developmental Psychology, 49*(2), 258–269. https://doi.org/10.1037/a0028320

Loyens, S.M.M., Magda, J. & Rikens, R.M.J.P. (2008). Self-Directed Learning in Problem-Based Learning and its Relationships with Self-Regulated Learning. *Educational Psychology Review, 20*, 411–427. https://doi.org/10.1007/s10648-008-9082-7

Martínez-Molina, A., Fernández-Méndez, L.M., Meneghetti, C., Jansen, P., Plaza, V., & Contreras, M.J. (2020). ERMENTAL: A Simple Web Environment to Design and Teach the Effects of Cognitive Training Experiments. In J. Šķilters et al. (Eds.): *Spatial Cognition 2020*, LNAI 12162, pp. 303–308, 2020. https://doi.org/10.1007/978-3-030-57983-8_23

Rodán, A., Gimeno, P., Elosúa, M. R., Montoro, P. R. & Contreras, M. J. (2019). Boys and girls gain in spatial, but not in mathematical ability after mental rotation training in primary education. *Learning and Individual Differences*, *70*, 1-11. https://doi.org/10.1016/j.lindif.2019.01.001

Rodán, A., Montoro, P.R., Martínez-Molina, A. & Contreras, M.J. (2022). Eficacia del entrenamiento espacial en primaria y secundaria: todos aprenden. *Educación XX1, 25*(1), 381-406. https://doi.org/10.5944/educXX1.30100

Zimmerman, B.J. & Schunk, D. (2008). Motivation. En D.H. Schunk y B.J. Zimmerman, (Eds.) (2008). *Motivation and self-regulated learning. Theory, research and application* (pp. 1 – 30). New York: Lawrence Earlbaum Associates.

Using imagery within a pedagogy of identity for online teaching and learning

Leigh-Anne Perryman[1]

[1] The Open University

Innovative impact

Having a strong sense of self, of personal identity, is essential to wellbeing and has been linked with successful study outcomes. Online teaching and learning has the potential to support identity development by drawing on an ever-increasing body of openly licensed and free to use images, audio and video resources and interactive teaching assets. However, time pressures, resource unavailability and lack of knowledge can lead to only dominant identities being represented, with learners already experiencing discrimination and disadvantage being further marginalised by the design and delivery of the courses that they study. This is particularly problematic for learners whose identities are emergent or fluid. This report outlines how a pedagogy of identity featuring appropriate use of imagery and drawing on the affordances of openness can support identity development, students' empowerment and sense of belonging and increase empathetic understanding and the development of strong learner communities. The report features a case study from an Open University microcredential which both models and teaches equitable teaching and learning design strategies.

Keywords: equity, pedagogy of identity, open educational practices, OER, open educational resources, inclusion

Introduction

A strong sense of identity can positively influence an individual's confidence, self-efficacy and wellbeing, all of which are crucial for effective learning. Teaching can affirm and undermine aspects of students' identities, and both support and stifle identity development.

A pedagogy of identity for equitable online teaching supports students in developing their personal and social identities while also ensuring those identities are recognised, valued and represented within course content, teaching activities and course resources. This report focuses on one aspect of a pedagogy of identity – the use of imagery.

Identity and representation
When people can connect their learning to their personal identity they are more likely to find their studies meaningful and to engage with them on a deeper level. However, it's not uncommon for course content and resources to reinforce dominant identities and marginalise others, reflecting the representation of dominant groups across society as a whole. A pedagogy of identity therefore involves ensuring diverse students' identities are represented in positive ways across all aspects of teaching and learning including the use of images, course videos and animations, podcasts, text-based resources, case studies and interactive games.

Identity representation can increase students' sense of belonging, making them feel valued and respected. It can show them they are not alone in the world and that others are like them, can increase peers' empathy and understanding and can be particularly important for students whose identities are emergent or fluid, or for students who are marginalised or oppressed in other aspects of their life. Discussing trans visibility, Nicolazzo (2020, pp. 121–122) comments that 'there is something powerful and deeply affirming about the ability to find yourself through text, imagery, film, or other forms of cultural representation'.

Using images

Images - primarily photographs and illustrations but also the imagery featuring in videos, animations and interactive games - can have great value in supporting learning (Delorme et al., 2018; JISC, 2015). However, the use of imagery needs to be carefully managed as images can not only motivate, empower, inspire and convey respect; they can also offend, exclude, alienate, and perpetuate disadvantage, discrimination and stereotyping. Using images to support identity representation and development is complicated by the fact that interpreting visual imagery is a subjective and emotion-rich process closely linked to individuals' personal preferences, experiences and values (Perryman, 2011).

When choosing imagery educators should be careful to avoid conveying and/or reinforcing stereotypes. Figures 1 and 2 below show two examples that could be seen as stereotyping: a transgender person depicted as a drag queen and three young Black men surrounded by graffiti. A pedagogy of identity can usefully involve educators practising counter-stereotyping by using imagery that challenges common stereotypes. Figure 3 below, depicting a female waste picker in Bogota, Colombia, could be used as counter-stereotyping, challenging a number of stereotypes about women's strength and typical occupations.

Figure 1: Photo by [Rochelle Brown](#) on [Unsplash](#).

Figure 2: Photo by [Brian Lundquist](#) on [Unsplash](#).

Figure 3: Female waste-picker in Bogota, Colombia. Photo by [Juan Arredondo/Getty Images/Images of Empowerment](#). Used under a CC BY-NC 4.0 licence.

When choosing an image, it's important to consider both the content (who and what is being represented) and the form (how it is being represented). For example, a photo of a person with apparently low socioeconomic status could portray them as disempowered and perpetuate stigmas around poverty by featuring a camera angle looking down on a person, gloomy lighting, people shown as looking despairing or dejected, people shown in dirty, messy homes and people shown eating fast food, especially if they are overweight. Such representation *may* be relevant for teaching in subjects exploring the impact of poverty but could otherwise be damaging.

Captions can be invaluable in minimising the likelihood of learners interpreting an image differently from the ways in which an educator intended it to work. For example, Figure 2 above shows the [Wynwood Walls](#) art project in the US where 50 street and graffiti artists,

representing 16 countries, have covered over 80,000 square feet of walls. Providing this information could help steer learners about the possible intended meaning of the image as a positive representation of the people depicted. Some image collections give guidance about caption wording, for example, the Images of Empowerment collection, focusing on women's lives and work, the Disabled And Here Collection, and the Gender Spectrum Collection, which gives comprehensive usage guidelines for their photos of transgender people and address the appropriateness of giving gender identity in a caption.

A pedagogy of identity will also involve considering the balance of images used in a single course, lesson, presentation or other resource, with the aim of representing a range of people with different identities.

Considering accessibility

Using imagery as part of a pedagogy of identity necessarily involves making it accessible to Blind and visually impaired students through the use of 'alt' text and long descriptions. However, such text can easily exclude, alienate, disempower, reinforce prejudice and convey a lack of respect and decisions will need to be made about which aspects of a person's visual appearance and the broader context should be mentioned; how to write descriptions when aspects of a subject's identity are unclear; and whether to mention skin colour and/or gender and/or gender identity.

Context is important here. Consider whether mentioning the gender, apparent race, skin colour, apparent sexual orientation or apparent disability of any people shown in an image is relevant to the reason the image is being used and whether doing so could positively support identity representation and development or could do the opposite. Some image libraries – for example, The Gender Spectrum Collection, Disabled and Here and Images of Empowerment – give contextual information and/or suggested long description or alt text. The Poet Training Tool gives useful general guidelines and interactive exercises though doesn't focus on equity and identity as such.

The benefits of openness

When sourcing resources representing learners' identities and backgrounds it can be unclear whether that resource is licensed for the use you intend. Open licenses, such as those developed by Creative Commons and listed in the Creative Commons License Chooser, offer a solution, giving a clear indication of the ways in which works can be used. The search tools in Google and Flickr have Creative Commons filters, as does the YouTube video search feature. However, it can often be more productive to use openly licensed image collections such as Unsplash, Pixabay, Pixahive, Nappy, Disabled And Here, The Gender Spectrum Collection and Images of Empowerment.

Openly licensed images and videos can also be found in collections of open educational resources (OER) - 'educational materials made freely and legally available on the Internet for anyone to reuse, revise, remix and redistribute' (The William and Flora Hewlett Foundation, 2013, p. 4). OER vary in size from complete courses and textbooks to individual lesson plans and videos and the sheer volume of OER available can make it easier for educators to represent learners' identities either by using resources in their original form or by adapting them. Sites such as OER Commons, Merlot and OpenLearn are good places to start when searching for OER. Students can also be supported in adapting OER themselves by finding more relevant images, audio and video assets, suggesting alternative case studies and examples, or changing the language used. This, in turn, can support students' identity development. If the amended resources remain openly licensed they can then be reshared to support other learners and educators in delivering a pedagogy of identity.

A microcredential case study

The Open University microcredential course *Online teaching: Embedding social, race and gender-related equity* both supports educators in equitable online teaching strategies, including delivering a pedagogy of identity, and also models those practices in its design. The course imagery was selected following the principles outlined above and the videos created for the course feature a diverse range of participants filmed in authentic locations in the Global South and North. The course team decided not to film any videos in the OU's

studios as this would create a distinction between participants only able to film themselves on mobile phones and those who could travel to the OU's campus. All alt text was written in consultation with the people represented or in the course images or following specialist guidelines. The course solely uses openly licensed resources, allowing students to adapt those resources to be appropriate to delivering a pedagogy of identity in their own teaching.

Conclusion

A pedagogy of identity, carefully managed and drawing on the affordances of openness, can empower learners who may otherwise be marginalised and excluded, supporting them in developing their own identities within a learning culture that value who they are and who they may be in the future. The use of appropriate imagery can be a powerful part of such a pedagogy.

References

Delorme, A., Poncet, M. and Fabre-Thorpe, M. (2018) Briefly Flashed Scenes Can Be Stored in Long-Term Memory, *Frontiers in Neuroscience* 12 (Oct). https://www.frontiersin.org/articles/10.3389/fnins.2018.00688/full.

JISC (2015) Digital images summary. https://www.jisc.ac.uk/guides/using-digital-media-in-new-learning-models/digital-images-summary.

Nicolazzo, Z. (2020) Visibility Alone Will Not Save Us: Leveraging Invisibility as a Possibility for Liberatory Pedagogical Practice. In Mayo, C. and Blackburn, M. (eds) *Queer, Trans, and Intersectional Theory in Educational Practice (Routledge Critical Studies in Gender and Sexuality in Education)* (120-132). Taylor and Francis.

Perryman, L. (2011) *Alienation and educational exclusion: A mixed methods study of teaching and learning with contemporary art in the Level 1 university curriculum.* [Unpublished PhD thesis]. The Open University.

William and Flora Hewlett Foundation (2013). *Open educational resources: Breaking the lockbox on education.* https://hewlett.org/wp-content/uploads/2016/08/OER%20White%20Paper%20Nov%2022%202013%20Final_0.pdf.

Activating academic distance education and study pace

Rieny van den Munchhof and Jeroen Winkels[1]

[1]Open Universiteit

Innovative impact
A change of educational model (including the introduction of more activating elements) in its Bachelor and Master programs has resulted in a substantive increase of study pace.

Keywords: quality assessment, study pace, activating academic distance education

Introduction

Between 2014 and 2018, Open Universiteit (OUNL) transformed its educational approach in all courses by introducing a new model of activating distance education with an emphasis on degree programs instead of individual courses and with the introduction of more structure and social and academic integration. In September 2014 all courses within the Master's programs and between 2016 and 2018 all Bachelor's courses were being taught following this new model.

This transformation introduced many changes from the perspective of the student, the lecturer, the student counselor and other support staff. These changes can be divided into four categories: changes with respect to the intake; changes in the organization; changes with respect to the social and academic integration; and changes in the didactic approach (see table 1). In this note, we use administrative data to measure the effect on study pace of students who follow distance education in the Netherlands and Flanders (Belgium).

Changing the educational model of OUNL in 2014 to improve study success

For a long time OUNL philosophy was directed to provide higher education for self-directed adult students who could decide for themselves what, where and how to study. In the first decade of this century the increase of academic success came to figure more prominently on the educational policy agenda's and OUNL formulated a new evidence-based educational model which would increase study success. In table 1 the measures are summarized (Schlusmans et al., 2016).

Factors influencing study success	Actions/measures
Intake	Intake with a student counselor; Strict entry requirements comparable to other universities; Design of a study plan; Information about the level of the study and the amount of study time necessary.
Organization	Introduction of an academic year; Courses with fixed schedules in the Master's programs; Courses with a combination of fixed and flexible schedules in the Bachelor's programs; Exams at pre-arranged times; No automatic renewal of registration; No additional exams; Deadlines within the course; Active monitoring of the students.
Social and academic integration	More contact with lecturers; Introductory and face-to-face-meetings; Virtual classrooms; More group work.
Didactic Approach	Online learning; Activating learning; Assignments and feedback; Study load more in accordance with EC.

Table 1: The new educational model of OUNL

Effect on study pace of Master's students

The number of EC a student earns in a year measures study success on program level. In table 2a this amount of EC on average was calculated for each cohort separately. We also looked at a comparable group of students studying in the former educational model (table 2b). Table 2 shows that compared to this reference group a considerable increase per year took place in most of the Master's programs: from 14 to 21 after one year, from 22 to 37 after two years, and from 30 to 41 after three years of study. In addition to the effects presented in table 2: after three years, almost half of the Master's students have graduated.

	After 12 months*		After 24 months		After 36 months	
	Mean	*N*	Mean	*N*	Mean	*N*
Master Business Process Managem. & IT (MABPM)**	25	*1150*	43	*867*	46	*488*
Master Computer Science (MACS)	16	*31*	34	*21*	47	*16*
Master Environmental Sciences (MAES)	10	*144*	17	*98*	24	*60*
Master Humanities (MAKC)	10	*245*	23	*167*	30	*122*
Master Management (MAMAN)	22	*2466*	38	*1763*	40	*923*
Master Educational Sciences (MAOW)	25	*532*	38	*383*	45	*246*
Master Psychology (MAPSY)	16	*718*	29	*465*	36	*292*
Master Law (MAR)	21	*812*	37	*539*	43	*338*
Master Software Engineering (MASE)	19	*232*	32	*179*	39	*128*
Total	21 EC	*6330*	37 EC	*4482*	41 EC	*2613*

*   *Students registered for at least 12 (24, 36) months and whose registration rights have ended in the first 6 months.*
** *between brackets the labels of the several disciplinary master's programs used in table 2b.*

Table 2a: Study pace: mean number of EC per year in master's programs New Educational Model, 2014-2021

	After 12 months		After 24 months		After 36 months	
	Mean	*N*	Mean	*N*	Mean	*N*
MABPM	11	*235*	22	*56*	29	*49*
MACS	12	*29*	24	*7*	37	*7*
MAES	12	*44*	12	*8*	21	*8*
MAKC	14	*155*	25	*40*	32	*32*
MAMAN	9	*562*	16	*260*	24	*207*
MAOW	9	*62*	19	*10*	23	*9*
MAPSY	17	*612*	30	*117*	41	*96*
MAR	19	*506*	28	*29*	33	*80*
MASE	16	*29*	26	*16*	36	*14*
Total	14 EC	*2298*	22 EC	*609*	30 EC	*502*

Table 2b: Study pace: mean number of EC per year in master's programs in the
Former Educational Model, the reference group, 2013-2014

Effect on study pace of Bachelor's students
Comparing the amount of EC students achieve in the first year for the reference group and the group studying in the new educational model, we notice a higher amount of EC achieved in the new model. Table 3 shows that in the former model students achieved 4,4 EC. In the new model the level of achievement increases to 6,2 EC.

	Reference group	New Educational Model		
		Total	Degree students	Non-degree students
	N=3387	N=12192	N=6381	N=5811
Number of EC aimed	11,4	15,8	21,6	9,6
Number of EC achieved	4,4	6,2	9,0	3,2

Table 3: Number of EC aimed and achieved in the first year, for students in the New Educational Model and the reference group.

We thereby observe a difference in both registration and achievement between students who have the ambition to follow a complete degree program and students who do not have this 'degree ambition'. We did the same analysis, but now for the first two study years of OUNL-students. Results are presented in table 4. Again, we see the effect of the new approach on study pace. In the reference group of students, the mean amount of achieved credits after two years is 18 EC. This amount increases to 27 EC for students following courses in the new model. The amount of achieved EC in the new model is more than 40 EC after three years, where it was less than 30 in the former model, a remarkable difference.

	Reference group	New Educational Model		
		Total	Degree students	Non-degree students
	N=940	N=2542	N=1931	N=582
Number of EC aimed	29,5	42,5	46,4	30,0
Number of EC achieved	18,2	27,4	30,0	17,6

Table 4: Number of EC aimed and achieved in the first two years, for students in the New Educational Model and the reference group.

Study pace is influenced by the format of the courses. OUNL uses a combination of so-called fixed and variable course formats within each degree program, but especially in the Bachelor's programs. Courses with variable start dates are crucial to guarantee an important principle behind the educational model, both the former and the new one: each new student should have the possibility to start studying as soon as possible. However, if courses are fixed (with respect to start dates, dates of virtual meetings, examination dates, etcetera) the proportion of students that pass their exam is higher than if courses are scheduled in a variable format.

Conclusion

Open Universiteit (OUNL) changed its educational model in 2013 and implemented it into its Bachelor's and Master's degree programs between 2014 and 2018. OUNL-wide programs were formulated to implement these changes and to look for further refinements. Our findings suggest that students study faster, especially Master's students. They achieve more EC per year than in the former educational model. We conclude that more emphasis on degree programs and the introduction of more structure and social integration helped to improve study pace.

References

Open Universiteit (2022). *The OUNL Educational Model: Activating Academic Distance Learning*. Heerlen: Open Universiteit.
https://www.ou.nl/documents/40554/809697/2022173_Onderwijsmodel_ENG.pdf

Schlusmans, K., van den Munckhof, R. & Nielissen, G. (2016). Active online education: a new educational approach at the Open Universiteit of The Netherlands.. In G. Ubachs & L. Konings (Eds.), *Proceedings of the Online, Open and Flexible Higher Education Conference* (pp. 163-176). Maastricht, the Netherlands: European Association of Distance Teaching Universities.

Van den Munckhof, R. & Winkels, J. (2022). Activating academic distance education, some empirical results about a new approach of the Open Universiteit (OUNL). In: Ubachs, G., Meuleman, S. & Antonaci, A. (2022). *Digital Reset: European Universities Transforming for a Changing World. Proceedings of the Innovating Higher Education Conference 2022* (I-HE2022). Zenodo.

10 Methods and activities for learning and assessment with generative AI

Xavier Mas-García, Loles González-García, Desirée Gómez-Cardosa and Guillem Garcia-Brustenga[1]

[1]Universitat Oberta de Catalunya (UOC)

Innovative impact

The emergence of generative artificial intelligence (AI) in education has led to a short-term need – and, likewise, a mid- to long-term opportunity – to develop methods and activities that aid meaningful learning and collaborative knowledge building.

Increasing the mix of different types of activity and deliverable helps avoid the current risk of work being produced in its entirety by AI. Promoting more specific and responsible use of AI can help foster a more conscientious and consequential learning process.

In the long term, we believe that the use of generative AI in education will become widespread, and teachers will use the technology to enrich their students' learning experiences. This requires adoption of a new way of focusing assessment, and the learning process as a whole, to develop more personalized and effective learning.

With this in mind, we propose a list of 10 methods and activities that can be used for learning and assessment alongside generative AI.

Keywords: Artificial Intelligence (AI); Artificial Intelligence in Education (AIEd); Generative AI; Large Language Model (LLM); ChatGPT; teaching methodologies; assessment

Generative AI and Education

The emergence of generative artificial intelligence (AI) – and, in particular, AI text generators and Large Language Models (LLM), such as ChatGPT – in the field of education has led to a revolution that has radically changed the way we teach and learn. Recent studies have shown that ChatGPT is able to show critical thinking skills and generating remarkably realistic text with a bare amount of inputs, making it a potential threat to the integrity of online exams, especially in higher education (Susnjak, 2022).

This technology, which allows for automatic generation of high-quality, coherent texts, brings with it challenges and opportunities for developing meaningful learning, collaborative knowledge building and applying assessment models that are both more formative and more reliable. One potential opportunity for ChatGPT in higher education, for instance, might be the creation of personalised assessments (Cotton *et al.,* 2023), it could even be used to improve formative feedback. The use of technology and different channels to provide feedback in online learning environments could contribute to make students more active with it and improve its effectiveness (Espasa *et al.*, 2022).

It is imperative for both teachers and students to keep up with the latest advances in technology, and

text-based generative AI is no exception. Its use in education could well be a valuable tool to help enrich learning experiences and aid access to a wide variety of educational materials and resources. However, it may also lead to the temptation (especially in online or distance education) to hand over the production of a deliverable entirely to the AI, which could have a negative effect on students' learning and skills development. As a result, educational institutions are now debating how to use it adequately, considering the ethical aspects and addressing concerns regarding how AI can undermine students' academic integrity. Some responses to these actions could be related to ethical issues, respect for peers and confidence in their own work, and more appropriate learning assessment methods which can be strong reasons for students not to cheat (Alves *et al.*, 2021).

To deal with this challenge and make the most of the opportunities offered by text-based generative AI, it is vital that we rethink the pedagogical methodologies and activities used in practice. This means increasing the mix of different types of activity and deliverable or designing activities that combine the use of text-based generative AI with other learning strategies so that students are required to use AI in a specific and responsible way. This approach fosters a more conscientious and effective learning process, as students have to reflect on the information provided by the AI and integrate it into their prior knowledge, and they have to develop their critical, analytical and creative skills. As we will see later, introducing practices such as the use of ePortfolios may help to develop these competencies. Studies such as Trimble (2018), show that when students transition from content consumers to content creators, the organization and presentation of their work becomes more complex.

Likewise, it is crucial that teachers adopt a more active role in guiding and monitoring the learning process, helping students to discern when it is appropriate to use text-based generative AI and when it is not. This may include training students in

[1]It should be pointed out that the UOC is an entirely online university, including assessment.

ethics and the responsible use of technology, or fostering critical thinking when it comes to using tools and sources of information. A good starting point for change may be taking the constructivist idea that the focus of education is not on content but on process, whereby educators need to know their learners in order to organise this process (Mattar, 2018). For instance, asynchronous interactive learning undertaken primarily through peer-to-peer discussion boards served as an important space for constructivist character education (Harrison and Laco, 2022). In this sense, some studies, as the one by Loes (2022) show that collaborative learning, exerted a statistically significant and positive influence on students' academic motivation.

Our Proposal

At the Universitat Oberta de Catalunya (UOC)[1] eLearning Innovation Center (eLinC), we believe that text-based generative AI has already made an impact on education and, as a result, there is a need to adapt methods and activities to learn and assess effectively. In other words, what was to date merely desirable for teaching quality and pedagogical excellence is now undeniably essential. Thus, we are strongly committed to high-quality, meaningful learning, and propose this list of 10 teaching methods that can be used for learning and assessment in this new setting where we have work alongside generative AI.

1) **Ask for deliverables in infographic format**. Even if the student uses AI to produce the answer to the activity, they must be able to understand and relate the concepts worked on, adapt to the requirements, and go over the results in order to be able to create a deliverable that shows a degree of specificity appropriate to what is requested, the relationship of the concepts used, a theme for the content, the relationship between the textual information and graphics, etc.

2) **Use tests**. When assessing command of theoretical content, such as laws, theoretical foundations, descriptions of phenomena, etc., the options to randomize questions offered by LMSs make it easier to prepare tests with different questions. In addition to options such as time limitations for answering the test.

3) **Use portfolios to enhance students' metacognitive reflection** on the working process they have used to produce an activity, image, design or audiovisual product, explain their approach to solving problems, justify the decisions taken, provide a critical view or self-assess their own work. Promote use of the social features to make contributions and share reflections on the contents published.

4) **Incorporate co-assessment**. Engage in co-assessment dynamics between peers at various points throughout the student's working process, making them include standardized qualitative assessments and reflections that are included in the final product (deliverable). Some LMSs, like Canvas, have specific features that allow for these kinds of assessment dynamics.

5) **Incorporate oral tests / interviews in the assessment process**. Incorporate various types of oral tests or interviews, such as presentation videos that include the students' metacognitive processes, as well as synchronous interviews to assess content and confirm the student's identity and authorship. These tests foster personalization and enhance the assessment process.

6) **Avoid generic questions in activities**. Formulate contextualized questions in a specific area or field, such as current events, a specific geographic location, or a specific company. Furthermore, contextualize the question in relation to the student's own learning process throughout the course.

7) **Include use of chat in activities** (text-based AI): to gamify activities or to help get an answer to a specific question. Make students consider the response received, identifying its weak points, highlighting the most well-prepared aspects, proposing improvements and complementing the text generated, always with well supported arguments.

8) **Encourage collaborative work**. Work collaboratively, using the different spaces available to open up and share in the working process, the discussion on how to approach the activity, the debates between the group members, and their reflections on the work done.

9) **Increase feedback throughout the learning process**. Establish different points of contact between the teacher and students (both individual and group) to provide personalized feedback prior to submission of the assignment, thereby enhancing the formative part of the continuous assessment, and linking the content of the deliverables to the learning process. Some LMSs, like Canvas, aid this type of feedback with their grading tools.

10) One option for improving students' assessment is to **include synchronous tests**. These tests can be organized in several ways, and adapted to the pace of the course and the number of students. The test can be taken in groups on courses that involve collaborative work. In more applied or practical courses, the synchronous test can also be an opportunity to do simulations, role play and other similar activities.

All these measures can be used either individually or together; for example, gamification can be applied to collaborative work while incorporating the use of AI.

Conclusions

Incorporating generative AI into education involves challenges and opportunities for meaningful learning and collaborative knowledge building. We believe that it is vitally important that we rethink pedagogical methods and activities to make the most of the opportunities offered by this technology, and to

ensure students cannot hand off production of deliverables in their entirety to the AI, especially in an online or distance education setting. Combining use of generative AI with other learning strategies, and active guidance from teachers are key to more meaningful, experiential and integrated learning. Our proposal for 10 teaching methods for learning and assessment with generative AI is one of the ways we foresee adaptation of teaching and learning processes to this new reality.

10 METHODS AND ACTIVITIES FOR LEARNING AND ASSESSMENT WITH GENERATIVE AI

How to use it for meaningful and high-quality learning

The recent emergence of **AI text generation** in education means there is now both a need and an opportunity to use methods and activities that aid meaningful learning and the collaborative construction of knowledge.

Varying the types of activity and deliverables means that students cannot always depend on AI to complete their tasks. This also fosters a more specific and responsible use of the technology and leads to a more conscious and effective learning process.

INFOGRAPHICS
Ask for deliverables in infographic format. Even if the student uses AI to produce the answer to the activity, they must be able to understand and relate the concepts worked on, adapt to the requirements, and go over the results in order to be able to create a deliverable that shows a degree of specificity appropriate to what is requested, the relationship of the concepts used, a theme for the content, the relationship between the textual information and graphics, etc.

USE OF TESTS
Use tests. When assessing command of theoretical content, such as laws, theoretical foundations, descriptions of phenomena, etc., the options to randomize questions offered by LMSs make it easier to prepare tests with different questions. In addition to options such as time limitations for answering the test.

PORTFOLIO
Use Portfolios to enhance students' metacognitive reflection on the working process they have used to produce an activity, image, design or audiovisual product, explain their approach to solving problems, justify the decisions taken, provide a critical view or self-assess their own work. Promote use of the social features to make contributions and share reflections on the contents published.

CO-ASSESSMENT
Incorporate co-assessment. Engage in co-assessment dynamics between peers at various points throughout the student's working process, making them include standardized qualitative assessments and reflections that are included in the final product (deliverable). Some LMSs, like Canvas, have specific features that allow for these kinds of assessment dynamics.

ORAL TESTS
Incorporate oral tests / interviews in the assessment process. Incorporate various types of oral tests or interviews, such as presentation videos that include the students' metacognitive processes, as well as synchronous interviews to assess content and confirm the student's identity and authorship. These tests foster personalization and enhance the assessment process.

SHORT AND CONTEXTUALIZED QUESTIONS
Avoid generic questions in activities. Formulate contextualized questions in a specific area or field, such as current events, a specific geographic location, or a specific company. Furthermore, contextualize the question in relation to the student's own learning process throughout the course.

INTEGRATE AI TOOLS IN ACTIVITIES
Include use of chat in activities (text-based AI): to gamify activities or to help get an answer to a specific question. Make students consider the response received, identifying its weak points, highlighting the most well prepared aspects, proposing improvements and complementing the text generated, always with well supported arguments.

COLLABORATIVE WORK
Encourage collaborative work. Work collaboratively, using the different spaces available to open up and share in the working process, the discussion on how to approach the activity, the debates between the group members, and their reflections on the work done.

FEEDBACK
Increase feedback throughout the learning process. Establish different points of contact between the teacher and students (both individual and group) to provide personalized feedback prior to submission of the assignment, thereby enhancing the formative part of the continuous assessment, and linking the content of the deliverables to the learning process. Some LMSs, like Canvas, aid this type of feedback.

SYNCHRONOUS TESTS
One option for improving students' assessment is to **include synchronous tests.** These tests can be organized in several ways, and adapted to the pace of the course and the number of students. The test can be taken in groups on courses that involve collaborative work. In more applied or practical courses, the synchronous test can also be an opportunity to do simulations, role play and other similar activities.

All these measures can be used **either individually or together**; for example, gamification can be applied to collaborative work while incorporating the use of AI.

References

Alves, A. C., Fernandes, S., & Uebe-Mansur, A. F. (2021). Online assessment: more student cheating than on-site? In Alves, A. C., Van Hattum-Janssen, N., M. Lima, R. (Ed.), *Proceedings of the International Symposium on Project Approaches in Engineering Education*; Active Learning in Engineering Education Workshop; International Conference on Active Learning in Engineering Education. (PAEE/ALE'2021), Braga - Portugal, 07 -09 July 2021. https://doi.org/10.5281/zenodo.5095020

Cotton, D.R.E., Cotton, P. A., & Shipway, J.R. (2023) Chatting and cheating: Ensuring academic integrity in the era of ChatGPT, *Innovations in Education and Teaching International*, https://doi.org/10.1080/14703297.2023.2190148

Espasa, A., Mayordomo, R. M., Guasch, T., & Martinez-Melo, M. (2022). Does the type of feedback channel used in online learning environments matter? Students' perceptions and impact on learning. *Active Learning in Higher Education*, 23(1), 49–63. https://doi.org/10.1177/1469787419891307

Harrison, T., & Laco, D. (2022). Where's the character education in online higher education? Constructivism, virtue ethics and roles of online educators. *E-Learning and Digital Media*, 19(6), 555–573. https://doi.org/10.1177/20427530221104885

Loes, C. N. (2022). The Effect of Collaborative Learning on Academic Motivation. *Teaching & Learning Inquiry*, *10*. https://doi.org/10.20343/teachlearninqu.10.4

Mattar, J. (2018). Constructivism and connectivism in education technology: Active, situated, authentic, experiential, and anchored learning. *RIED. Revista Iberoamericana de Educación a Distancia*. http://hdl.handle.net/11162/166929

Susnjak, T. (2022). *ChatGPT: The End of Online Exam Integrity?*. https://doi.org/10.48550/arXiv.2212.09292

Trimble, T. (2018). *ePortfolio Technology in Higher Education.* ProQuest Dissertations & Theses Global. https://www.proquest.com/dissertations-theses/eportfolio-technology-higher-education/docview/2191717794/se-2

Open and Inclusive Distance Learning: The Learning Analytics Case

Theodora Kouvara[1], Rozita Tsoni [2,3], Elias C. Stavropoulos[2,3] and Vassilios S. Verykios[2,3]

[1] Educational Content, Methodology and Technology Lab, eeyem.eap.gr
[2] Big Data Analytics and Anonymization Lab, batlab.eap.gr
[3] School of Science and Technology, Hellenic Open University, Patras, GREECE

Innovative impact

Distance education has emerged as a solution to the limited access and exclusion faced by different groups of students in education. However, technical challenges for openness and inclusion remain to a large extent, unresolved and without a cure in sight. Learning analytics (LA) has gained broad acceptance as a tool to promote inclusivity by transforming all kinds of student data into insights that augment automated decision-making. In our lab at the Hellenic Open University (HOU), we are researching the potential of applying LA techniques to track students' tastes, preferences, emotions and sentiments, as well as the detailed daily activity of students in collaboration networks to ensure inclusivity by breaking down the barriers of conformance to the one size fits all solutions. Towards this goal, we employ different machine learning and data mining techniques, and we aim at demonstrating how LA can come to the rescue of inclusion by offering personalized recommendations and real-time feedback to students, and the rest of the stakeholders in Higher Education Institutes.

Keywords: Learning Analytics, Machine Learning, inclusion, accessibility, openness, Distance Education

Introduction

LA can support inclusivity in education by leveraging data to provide insights, minimize exclusion and improve accessibility for students facing personal obstacles, including those with disabilities or from marginalized backgrounds. Through identifying educational barriers, LA enables personalized strategies and equal opportunities for all students, promoting inclusivity in education.

In the ensuing sections, this article will present a detailed discussion of the research conducted by the Big Data Analytics and Anonymization Lab (BATLab) on the potential of LA to promote inclusivity in distance education. We will delve into the methodologies, findings, ethical considerations and potential challenges associated with the use of LA in distance education, and highlight the implications of our research for future developments.

BATLab Insights
BATLab, is a leading research laboratory in the School of Science and Technology at the Hellenic Open University (HOU), established with a vision to provide state of the art research services and solutions on large-scale data management, educational data mining (EDM) and learning analytics as well as privacy preservation and anonymization. One of our main goals is to understand students' behavior and interactions through advanced LA techniques, enabling informed decisions to improve learning processes and service quality. We use LA to identify patterns for a deeper understanding of education and improvement opportunities. Additionally, we explore LA's potential to track emotions, sentiments, collaboration networks and diverse learning needs, ensuring ethical data use and inclusivity. This line of work has resulted in the publication of several studies, including Kagklis et al., 2017; Gkontzis et al., 2017; and Tsoni et al., 2019.

Anonymization, Profiling and Outlier Detection in Data Analysis

Anonymization methods enable privacy protection in Content and Learning Management Systems (CMSs/LMSs), while granting authorized access to necessary data. The BATlab emphasizes on implementing Statistical Disclosure Control (SDC) techniques which address privacy concerns in Learning Analytics (LA) (Stathatou et al., 2022). Our studies include implementing and deploying data and machine pipelines (Tsoni et al., 2021b) which give emphasis on privacy (Kyritsi et al., 2018), promoting in this way inclusion by safeguarding sensitive data.

Student profiling helps identify factors hindering success, as well as enabling personalized interventions. Along these lines we have proposed Social Network Analysis (SNA) and Principal Component Analysis (PCA) techniques, to reveal latent traits of distance learning students for targeted support and improved retention (Tsoni et al., 2022c).

Additionally, we are able to identify latent traits in social behavior by using outlier detection techniques (Tsoni et al., 2021a). Analyzing data with social network analysis and clustering, we identified three major factors, explaining over 70% of data variance: academic performance, social status and online participation. By grouping students into different sociobehavioral and accomplishment clusters, this methodology aids tutors in monitoring and intervening, when necessary, in the progress of students.
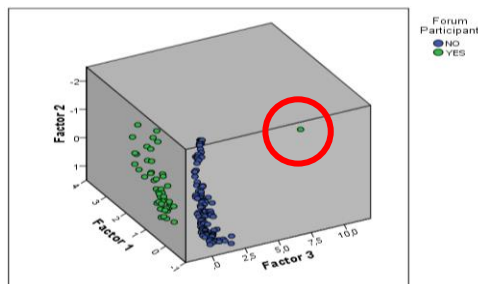

Figure 1: A super-poster in the latent space of students

Learning analytics has the capacity to foster inclusivity in education by anonymizing student data and identifying outliers. Outlier detection techniques can uncover learning patterns and behaviors that suggest challenges and unapparent obstacles that students may encounter. By using such techniques, it is possible to identify typical roles, such as "super posters," who dominate discussions with an excessive number of posts, impeding their peers from expressing their opinions (Figure 1). This behavior not only hinders their social learning but also puts them at risk of personal failure, having a negative impact on the learning community as a whole.

Social Network Analysis in Educational Data

Social Network Analysis (SNA) can be a valuable tool in addressing communication and collaboration difficulties among students, including those with diverse needs such as Pervasive Developmental Disorder (PDD), by identifying peripheral participants in a learning community and facilitating their inclusion. Our research highlighted the importance of identifying the "More Knowledgeable Other" through LA to support students in need. By utilizing SNA, we can uncover relationships between students and identify those who may be struggling with social learning tasks. Our work utilized SNA to analyze the communication and collaboration patterns among students in distance learning courses and identify those who may need additional support, promoting their inclusion in the learning community (Figure 2). Through targeted interventions, we can develop strategies that foster inclusion and ensure that all students have the opportunity to participate fully in the learning community (Tsoni & Verykios, 2019).
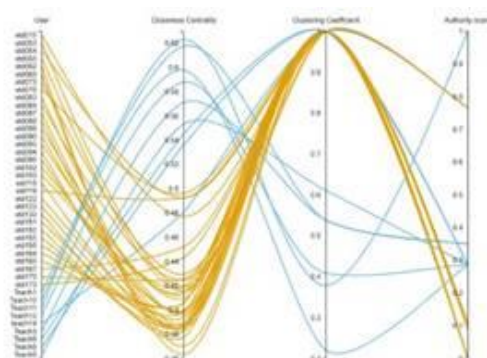

Figure 2: Important SNA metrics for the students (brown) and their tutors (blue).

Admission and geographical data

Our recent results show that geographical factors significantly impact learning access, even in distance courses. We stress analyzing admission and geographical data to enhance experiences for diverse students (Kagklis et al., 2017). Data visualization helps educators address access difficulties and absenteeism by identifying barriers and developing targeted interventions. We use admission and geolocation data to ensure seamless learning for students of different geographical origins, focusing on creating inclusive and accessible educational experiences (Samaras et al., 2022).

Polarity and Sentiment Analysis

LA can address emotional challenges faced by students, particularly those facing psychological disorders or personal and family issues. Polarity and sentiment analysis uncovers negative emotions, enabling tutors to offer tailored support (Figure 3). Our research demonstrates sentiment analysis value in tracking emotions and identifying struggling students. By monitoring students' emotional well-being, we strive to develop strategies for emotionally supportive learning environments (Gkontzis et al., 2017; Samaras et al., 2020; Tsoni et al., 2020).

Figure 3: By analysing the sentiment in students' messages, we can boost their support (green area) or detect their discontent (red area).

Timeseries Analysis to monitor changes to the behavioral patterns and LA Dashboards

To emphasize the importance of inclusion in education and further demonstrate the potential that data analysis techniques have for addressing challenges faced by non-privileged students, we conducted a study analyzing educational performance data (Samaras et al., 2022). Further studies use time series analysis to predict LMS activity, notifying educators when students need increased aid (Verykios et al., 2022; Tsoni et al., 2023b). These methods identify performance and engagement patterns, enabling in this way teaching adjustments and extra support. Learning Analytics dashboards offer real-time visualization of Machine Learning results, helping educators track progress and pinpoint areas needing additional assistance (Tsoni et al., 2022).

Educational resources effectiveness

Leveraging data and machine learning pipelines as well as warehouses in educational research can improve teaching and learning outcomes (Tsoni et al., 2023). Our studies in this realm examplify the need for a holistic approach to educational data mining, involving automated data gathering, arrangement and manipulation. Analyzing student actions in LMS using machine learning techniques, allows evaluating resource frequency use, effectiveness and usefulness. Reporting results to stakeholders enables continuous assessment and adaptation for the target audience, benefiting inclusive education. However, maintaining ethical standards and prioritizing privacy when using digital tools, is also essential.

Conclusion – Our vision

By carrying out fundamental and applied research in our lab, we cater for utilizing in different ways how EDM and LA can enhance inclusivity in distance education, by applying different methodologies, such as outlier detection and sentiment analysis to support struggling students. However, there is room for further improvement and intervention. Future research will focus on creating personalized recommendations and adaptive learning environments based on students' digital twins, by utilizing machine learning-based recommendation systems. Leveraging digital traces by observing all the fundamental rights of students can democratize education and help individuals reach their full potential, regardless of their starting point, or their geographical origin.

References

Gkontzis, A. F., Karachristos, C. V., Panagiotakopoulos, C. T., Stavropoulos, E. C., & Verykios, V. S. (2017). Sentiment analysis to track emotion and polarity in student fora. In Proceedings of the 21st Pan-Hellenic Conference on Informatics (pp. 1-6).

Kagklis, V., Lionarakis, A., Marketos, G., Panagiotakopoulos, C. T., Stavropoulos, E. C., & Verykios, V. S. (2017). Student Admission Data Analytics for Open and Distance Education in Greece. Open Education: The Journal for Open & Distance Education & Educational Technology, 13(2).

Kyritsi, K. H., Zorkadis, V., Stavropoulos, E. C., & Verykios, V. S. (2018). Privacy issues in learning analytics. Blended and Online Learning, 218.

Samaras C., Tsoni R., & Verykios V. S. (2020) Multiple interactive visualizations to review content and polarity of forum posts in tertiary distance education. In Proc. of the 3rd International Experiential Conference on Applied Teaching "New Challenges in Education".

Samaras, C., Tsoni, R., Paxinou, E., Kotsiantis, S., & Verykios, V. S. (2022). Coping with Access Difficulties and Absenteeism through Data Visualization: A Case Study from a Rural Vocational School in Northern Greece. Applied Sciences, 12(14), 6946.

Stathatou K., Tsoni R., Panagiotakopoulos C. & Verykios V. S. (2022). Implementing Statistical Disclosure Control in Educational Data. In Proceedings of HIUCICTE2022.

Tsoni R., & Verykios V. S. (2019). Looking for the "More Knowledgeable Other" through Learning Analytics. ICODL 2019. 10(3A), 239-251.

Tsoni R., Garani G., Verykios V.S. (2023). Data Pipelines for Educational Data Mining in Distance Education. Interactive Learning Environments. Taylor and Francis.

Tsoni R., Garani G. & Verykios V.S (2023b). Incorporating Data Warehouses into Data Pipelines for Deploying Learning Analytics Dashboards. In Proceedings of 13th International Conference on Information, Intelligence, Systems & Applications (IISA). IEEE (to appear).

Tsoni, R., Panagiotakopoulos, C. T., & Verykios, V. S. (2021a). Revealing latent traits in the social behavior of distance learning students. Education and Information Technologies, 1-37.

Tsoni R., Paxinou E., Panagiotakopoulos C., & Verykios, V. S. (2022b). Building Learning Analytics Dashboards for Distance Learning through Data Pipelines. In the proceedings of I·HE2022, EADTU.

Tsoni, R., Paxinou, E., Stavropoulos, E., Panagiotakopoulos, C. T., & Verykios V. S. (2020). Looking under the hood of students' collaboration networks in distance learning. The Envisioning Report for Empowering Universities, 39.

Tsoni R., Sakkopoulos E., & Verykios V. S. (2022c). Revealing Latent Student Traits in Distance Learning through SNA and PCA. Handbook on Intelligence Techniques in the Educational Process. Springer.

Tsoni, R., Zorkadis V. & Verykios, V. S. (2021b). A data pipeline to preserve privacy in educational settings. In Proceedings of the 25nd Pan-Hellenic Conference on Informatics. ACM.

Verykios V. S., Tsoni R., Garani G., & Panagiotakopoulos C. T. (2022). Fleshing out Learning Analytics and Educational Data Mining with Data and ML Pipelines. Springer.

RE-Write: a mobile app as an L2 English teaching-learning resource for writing authentic texts based on textual genres

Silvia Sánchez Calderón, Imelda Katherine Brady, Aurelia Carranza Márquez, Iria da Cunha,
María Ángeles Escobar Álvarez, Sara Pistola Grille and Elena Romea Parente [1]

[1] National University of Distance Education (UNED)

Innovative impact

This paper analyzes the design of the mobile application RE-Write (Resources for English Writing) as an autonomous learning resource for the development of written production of English texts based on textual genres. Examples of these textual genres include opinion essays, job application letters, formal emails or articles. The learning resources hosted in each textual genre are structured as follows: (a) a brief videotutorial that explains the structure and the content of each text, along with the main linguistic features from three main approaches, namely, lexicon (semantic fields), grammar (verbal tenses) and discourse (use of connectors, rethorical figures), (b) a golden text extracted from an online and open access source, that will serve users as a model pattern for writing their own texts and (c) self-corrected activities with gamification that will allow to measure the users' progress by obtaining points or trophies. Previous empirical studies have evidenced that students show high motivation for learning English through the use of mobile phones and the development of written production of texts in this language has considered to be positive via Mobile Assisted Language Learning (MALL) (Hao, Lee, Chen and Sim 2019; Khalitova and Gimaletdinova 2016). Therefore, RE-Write aims to contribute to help English second language learners with an A2-B1 level develop autonomous learning in the writing of textual genres through MALL and also aid these learners along their academic performance.

Keywords: mobile application, textual genres, self-correction, written production, English, autonomous learning

Introduction

This paper details the design of a mobile application entitled Re-Write (Resources for English Writing), designed as a tool to support Spanish learners of English as a second language (L2) in the autonomous development of their writing skills. Re-Write provides a range of 11 sample textual genres – from formal and informal emails and letters, to narratives, reviews and periodistic articles, each analyzed and explained in terms of structure as well as linguistic and pragmatic content. Each sample or 'golden text' is accompanied by a short video tutorial in Spanish offering practical examples of structural, grammatical, lexical and pragmatic features of the textual genre in question. RE-Write has been designed by the Innovation Group OLGA (2018-3) at the UNED in conjunction with the technical assistance of Dabasystem Solutions. Aside from enabling the user to select particular textual genres to work on, it also allows the designers to access statistical analysis of use and thus facilitate analysis of user data.

Sate of the art

Technological development is being implemented in education. The use of the mobile phone is very popular and there is a great interest in integrating its use in the classroom (Buston 2015; Jarvis and Achilleos 2013; Khalitova and Gimaletdinova 2016). This incorporation has brought forth some changes, updating the methodologies used for the teaching of foreign languages, like English, with technologies from Mobile-Assisted Language Learning (MALL) (Basoglu and Akdemir 2010; Cavus and Ibrahim 2009).

Studies carried out about the subject suggest that mobile technology has proven to be a valid didactic resource and plays a key role in the improvement of foreign language learning for different reasons: it allows students to learn without any restrictions of time or place, and it increases students' interest and motivation for learning (Beauchamp, Burden and Abbinett 2015; Levy and Kennedy 2005; Simon and Fell 2012; Zhang, Song and Burston 2011). According to Conrad and Donaldson (2004), MALL provides students with online resources that contribute to the development of different skills (production and understanding of oral and written texts). Also, improvement in the development of vocabulary through the mobile application VocUp has been reported within the context of distance education (Makoe and Shandu 2018). These results suggest that mobile learning technologies are effective within distance education for their flexibility, openness, availability, and their potential for the design of activities that include efficient feedback when human interaction is not possible.

Another example of a successful mobile application for the study of English as a foreign language is "Grammar Clinic". Li and Hegelheimer (2013) evaluated this tool in relation to the development of grammar accuracy in the production of written texts by students of English. Their results indicated that 82% of the participants (N=17) agreed with the easiness of the app and 76% reported that the app helped them be aware of the mistakes in their written compositions and in those of their peers.

Hao, Lee, Chen and Sim (2019) focused on students with a basic level of linguistic competence. They studied the efficacy of an application for the acquisition of vocabulary in 10 secondary education students (12-13 years of age) in Taiwan. Results were obtained through class observation and showed that the use of the application improved their spelling, their oral production and reception skills and helped them memorize English vocabulary. Besides, it reduced the anxiety level in their learning process. It not only supported cooperative learning but also had a positive impact on their self-confidence and fostered positive attitudes towards the process of vocabulary learning.

Likewise, MALL, through gamification, has shown to contribute positively to the motivation of students with a low level of linguistic competence in English in relation to language learning. It has also improved cooperative learning and helped teachers provide automatic feedback (Basoglu and Akdemir 2010; Schwabe and Göth 2005). For example, Schwabe and Göth (2005) designed the game Treasure Hunting as a didactic resource to improve interest on language learning through directional games such as navigation maps.

Hao, Lee, Chen and Sim (2019) used the application "Detective ABC". It included gamification with resources addressing production and reception skills on written and oral texts based on the student's coursebook. For each skill, it included stories based on the resolution of puzzles that lead to the achievement of specific missions. Such missions had different levels for the development of vocabulary in context and taking into account real communicative situations. In conclusion, games have proven to be useful tools for the acquisition of linguistic contents, motivation for language learning and academic performance (Elaish, Shuib, Gani and Al-Haiqi 2019).

Methodology

For this work, 11 textual genres which are commonly used by teachers and learners of instrumental English (Cassany 1990; Melissourgou and Frantzi 2017) were selected: news article, opinion essay, thank you letter, letter of complaint, job application letter, informal letter (to a friend), formal email, informal email (to a friend), report, storytelling/narrative essay, and book/film review.

The type of resources to be integrated into the Re-Write mobile application were defined. Specifically, the following resources were prepared for each textual genre:

1. **A Short video tutorial** (between 8-10 minutes). The following information was included:
- Textual structure of the genre.
- Prototypical semantic content of each section.

- Prototypical linguistic features of each textual genre:
  - Lexical features. E.g., formal vs. informal lexicon, terminology related to a specialised field, lexical units denoting emotion, greeting and farewell formulas.
  - Morphosyntactic features. E.g., verb tenses, syntactic structures, contractions.
  - Discourse features. E.g., inclusion of lists, connectors, enumerations, exclamations.

2. **A golden text**, adapted for the purposes of this project. This text will serve as a reference for users of the application when writing the same textual genre. These texts were extracted from online and open access resources.

3. **Self-correcting learning activities**. These activities will help users to reinforce what they have learned through the resources available in the application. Each textual genre will integrate four activities, related to (a) textual structure and content, (b) use of lexicon, (c) grammatical particularities and (d) the use of discursive resources. The activities are of two types:

- Activities on selection of a picture from a few options. E.g., selecting the image which corresponds to the appropriate structure and content of a textual genre.
- Activities on multiple-choice questions with four answer options.

The self-learning activities have the resource of gamification. Thus, as users complete the activities corresponding to each textual genre, they obtain trophies or cups that measure their progress. Likewise, the mobile application integrates sound effects depending on whether the answers are correct or incorrect.

Finally, these resources were integrated into the mobile application. In addition, a direct access to a repository of open access online tools for self-correction of written productions in English (e.g. Grammarly, AutoCrit, Outwrite, Hemingway, Reverso) was included, as available in https://blogs.uned.es/herramientasautocorreccionescrituraingles/. This repository is located on an institutional blog of our university, and it was created in the framework of a previous teaching innovation project.

Conclusion

To conclude, this paper discusses a project that attempts to offer materials for students who need innovative skills and competences to respond to 21st century needs. In particular students are guided to design the structure of most frequent L2 English textual genres to succeed in their writing.

References

Basoglu, E. B., & Akdemir, Ö. (2010). A Comparison of Undergraduate Students' English Vocabulary Learning: Using Mobile Phones and Flash Cards. *The Turkish Online Journal of Educational Technology*, *9*(3), 1-7.

Beauchamp, G., Burden K., & Abbinett, E. (2015). Teachers Learning to Use the iPad in Scotland and Wales: A New Model of Professional Development. *Journal of Education for Teaching*, *41*(2): 161-179. https://doi.org/10.1080/02607476.2015.1013370

Cavus, N., & Ibrahim, D. (2009). M-Learning: An Experiment in Using SMS to Support Learning New English Language Words. *British Journal of Educational Technology*, *40*(1), 78-91. https://doi.org/10.1111/j.1467-8535.2007.00801.x

Conrad, R. M., & Donaldson, J. A. (2004). *Engaging the Online Learner: Activities and Resources for Creative Instruction*. Willey.

Elaish, M. M., Ghani, N. A., Shuib, L., Al-Haiqi, A. (2019). Development of a Mobile Game Application to Boost Students' Motivation in Learning English Vocabulary. *IEEE Access*, *7*: 13326-13337. https://doi.org/10.1109/ACCESS.2019.2891504

Hao, Y., Lee, K. S., Chen, S. T., & Sim, C. S. 2019. An Evaluative Study of a Mobile Application for Middle School Students

Struggling with English Vocabulary Learning. *Computers in Human Behavior*, *95*, 208-2016. https://doi.org/10.1016/j.chb.2018.10.013

Jarvis, H., & Achilleos, M. (2013). From Computer Assisted Language Learning (CALL) to Mobile Assisted Language Use (MALU). *TESL-EJ, 16*(4): 1-18.

Khalitova, L., & Gimaletdinova, G. (2016). Mobile Technologies in Teaching English as a Foreign Language in Higher Education: a Case Study of Using Mobile Application Instagram. International Technology, Education and Development Conference.

Levy, M., & Kennedy, C. (2005). Learning Italian via Mobile SMS. In A. Kukulska-Hulme, & J. Traxler (Eds*.), Mobile Learning a Handbook for Educators and Trainers* (pp. 76-83). Routledge.

Li, Z., & Hegelheimer, V. (2013). Mobile-Assisted Grammar exercises: Effects on Self-editing in L2 Writing. *Language Learning & Technology 17*(3), 135–156.

Makoe, M., & Shandu, T. (2018). Developing a Mobile App for Learning English Vocabulary in an Open Distance Learning Context. *International Review of Research in Open and Distributed Learning 19*(4): 208-221. https://doi.org.10.19173/irrodl.v19i4.3746

Simon, E. F., & Fell, C. P. (2012). Using Mobile Learning Resources in Foreign Language Instruction". Retrieved from http://www.educause.edu/ero/article/using-mobile-learning-resources-foreign-language-instruction

Schwabe, G., & Göth, C. (2005). Mobile Learning with a Mobile Game: Design and Motivational Effects. *Journal of Computer Assisted Learning 21*(3), 204-216.

Zhang, H., Song, W., & Burston, J. (2011). Reexamining the Effectiveness of Vocabulary Learning via Mobile Phones. *Turkish Online Journal of Educational Technology – TOJET 10*(3), 203-214.

Planetary well-being as a strategic goal – The University of Jyväskylä pursues Green Campus policies

Saana Kataja-aho[1,2,3], Anni Karhunen[4] and Jukka Lerkkanen[1]

[1] Open University of the University of Jyväskylä

[2] University of Jyväskylä, Department of Biological and Environmental Science

[3] University of Jyväskylä, School of Resource Wisdom

[4] University of Jyväskylä

Innovative impact

Recognition by the scientific community within the University of Jyväskylä (JYU) of the green transition not just as a pivotal area of academic research and education, but necessarily as a key strategic goal for the higher education institution as a whole, is essential to the success of the environmental goals that the University has set for itself. In pursuing Green Campus policies, the University has committed to the development and provision of accessible, multidisciplinary academic education on the themes of sustainability and responsibility and to the dissemination of scientific research on these topics to society at large.

Keywords: sustainability, green campus, planetary well-being, MOOC

Introduction

As the ecological and systemic crises faced by humans and all life on Earth continue to intensify, societies increasingly face an urgent need for research and tools for promoting ecological, social and cultural sustainability. The scientific community within the University of Jyväskylä (JYU) has recognised green transition not just as a pivotal area of academic research and education, but necessarily as a key strategic goal for the higher education institution itself. In accordance with Green Campus ideals, JYU has established sustainable development policies to reduce its climate and biodiversity impacts, with the aim of reaching carbon negativity by 2030. Further, JYU prioritises the accrual of sustainability and planetary well-being knowledge within both formal degree studies and open university studies offered at the university.

Environmental programme of JYU

The University of Jyväskylä works actively to promote planetary well-being on the local, national and international level. In 2022, JYU's University Board approved a new environmental programme for 2022–2030, titled Roadmap to planetary well-being (University of Jyväskylä, 2022).

The programme states that by 2030 JYU will have achieved carbon neutrality and will cause no net loss of biodiversity. The vision is to be a carbon negative and nature positive higher education institute from 2030 onwards.

The programme sets the year 2019 as a baseline for measuring e.g. the carbon footprint and biodiversity impact of energy consumptions of the University. According to the roadmap, the calculations will be conducted annually to track the effectiveness of JYU's actions.

The intent of the University is to primarily avoid climate and biodiversity impacts altogether, and secondarily to reduce them. Compensation of impacts is viewed as the last option for achieving the desired

affect. The programme details eight goals to be achieved:

1. Changing consumption habits
2. Sustainability of ownership and investments
3. Change in travelling behaviour
4. Sustainable construction
5. Compensating the remaining environmental impacts
6. Campus development
7. Connecting planetary well-being to policy planning at JYU
8. JYU as a pioneer

The University of Jyväskylä will, as part of its annual sustainability and responsibility report, monitor the progress and attainment of these goals. The University has further committed to developing impact calculation methods and an offsetting model.

The environmental programme is also how JYU interprets and implements within its context the Green Campus philosophy: a college or university campus designed, built, and operated in an environmentally sustainable manner (EADTU, 2023).

School of Resource Wisdom
JYU.Wisdom is a multi-faculty community of over 200 sustainability experts in the University of Jyväskylä (University of Jyväskylä, 2023). The main task of the community is to foster the research and education of planetary well-being. JYU.Wisdom contemplates solutions for circular economy, responsibility, and sustainability in the use of natural resources. In addition, JYU.Wisdom advocates evidence-based decision-making by actively interacting with society and developing sustainability education.

The concept of planetary well-being was first launched by JYU.Wisdom (JYU.Wisdom Community, 2021). The term refers to a state in which the integrity of Earth systems and ecosystem processes is maintained to the extent that species (human and non-human) and populations can persist in their natural habitats into the future.

Planetary well-being is the overarching theme the University's environmental programme. Moreover, JYU endeavours to promote sustainability and to, for its part, implement UN Sustainable Development Goals (especially target 4.7 is relevant in this context) (United Nations), through for instance the university-wide adoption in degree programmes of a MOOC course on themes of sustainability.

Developed by JYU.Wisdom in collaboration with the JYU Faculty of Mathematics and Science and JYU Open University, *Introduction to Planetary Well-being* will be a compulsory course for all basic degree students at the University of Jyväskylä from 2024 onwards.

The course, which is one of four MOOCs under the headline *Planetary Well-being*, is offered for degree students and anyone interested alike, via JYU's Open University. As such, the emphatic role conferred by the University on this course, not just within degree provision but openly accessible higher education, is testament to JYU's pioneering stance on the priority of sustainability themes within Finnish higher education.

Open University of the University of Jyväskylä
An independent institute within the University of Jyväskylä, the Open University promotes lifelong learning by making university education accessible to all, with no prerequisites for entry. Another key factor in that ethos of openness is the Open University's commitment to flexible modes of study and its emphasis on distance learning.

Online courses on climate change and sustainability
The Planetary Well-being MOOCs (Open University of University of Jyväskylä, 2023a) were first introduced into the study offering of the Open University of Jyväskylä in 2021. Fully online and free of charge, these MOOC studies cover themes such as climate change, biodiversity loss and resource wisdom. As of spring 2023, three courses have been released in English, with the fourth and final course to be published later in 2023.

All *Planetary Well-being* study materials are offered freely through JYU's online platform to enable anyone in the world interested in building their knowledge and learning from scientific research to complete studies at

JYU Open University. All the MOOCs are offered in Finnish and English. The completion of the courses and the attainment of ECTS are dependent on the student registering (electronic identification via EU ID or passport) for the course.

The first MOOC, *Introduction to Planetary Well-being*, examines the environmental crises of climate change and biodiversity loss. The course also introduces the multidisciplinary concept of planetary well-being.

The second MOOC, *Systems and Planetary Well-being*, explores the properties and interactions of natural and social systems from a systemic perspective, emphasising sustainability issues.

The third course, *Good Life and Planetary Well-being*, introduces ethical perspectives on environmental and sustainability issues and considers the good life in the context of planetary well-being.

The fourth MOOC, *Pathways to Planetary Well-being*, introduces the contents and means of promoting sustainability, with an emphasis on a systems perspective and planetary well-being.

In 2023, JYU Open University has further added to its selection of studies within the field of sustainability and the environment by introducing *Nature Under Threat* courses (Open University of University of Jyväskylä, 2023b). The two new online courses are multidisciplinary, combining elements of humanities to the field of biological and environmental sciences. *Nature Under Threat* offers insight into endangerment and the surrounding ecological and social phenomena in an accessible way.

The first course delves into the causalities behind biodiversity loss as well as the societal implications of endangerment. Further, the first course introduces the concept of red-listed assessments, which are used to evaluate the risks of extinction and ecological collapse. The second course clarifies e.g. how the risks of extinction and ecological collapse (for species and ecosystems, respectively) are evaluated as part of red-list assessments that are conducted according to the IUCN (International Union for Conservation of Nature) methodology.

Similarly to *Planetary Well-being*, *Nature Under Threat* courses are also fully online and fully flexible, free of charge for anyone to study and with no requirements of prior education. Access to study materials as well as completion of the courses requires registration. Both courses are offered in Finnish and English. The first *Nature Under Threat* course is currently available for study, while the second course will be published later in 2023.

Nature Under Threat was created in collaboration with the Universities of Jyväskylä, Helsinki, Turku, Eastern Finland and Oulu, as well as the Finnish Museum of Natural History. The courses are included in the study selection of the Biodiversity Education Network of Finnish Universities.

Conclusion

The University of Jyväskylä's policies are imbued with Green Campus ideals. The environmental programme of JYU meticulously directs the University's operations and practices towards a culture of sustainability and states that the themes of sustainability and responsibility are to be included in the learning outcomes of all JYU degree programmes. JYU's curriculum policies specify sustainability knowledge as essential to acquire within one's university studies by making one of the *Planetary Well-being* courses compulsory for its degree students from 2024 onwards. This, in addition to the continued development of accessible education on environmental issues, is one measure through which JYU strives for a position of leadership in sustainable development and responsibility both in Finland and internationally.

References

EADTU. (2023). Task Force Green Campus, Terms of reference.

Open University of University of Jyväskylä. (2023a). Planetary well-being: Science for everyone. https://www.avoin.jyu.fi/en/courses-offered/planetary_wellbeing

Open University of University of Jyväskylä. (2023b). Nature Under Threat Studies. https://www.avoin.jyu.fi/en/courses-offered/nature-under-threat

University of Jyväskylä. (2022). *Roadmap to planetary well-being – Environmental Programme of the University of*

Jyväskylä 2022 – 2030.
https://www.jyu.fi/en/university/organisation-and-management/regulations-and-principles/sustainable-and-responsible-university/jyu-roadmap-to-pw_en.pdf

University of Jyväskylä. (2023). *JYU.Wisdom - School of Resource Wisdom.* https://www.jyu.fi/en/research/wisdom

JYU.Wisdom community (2021). Planetary well-being. *Humanities and Social Sciences Communications 8, 258.* https://doi.org/10.1057/s41599-021-00899-3

United Nations. *The 17 goals.* https://sdgs.un.org/goals

Online Proctoring Managers supporting digital transformation at Higher Education Institutions

Dario Assante[1], Karolina Armonaite[1], Cengiz Hakan Aydin[2], Tim Brüggemann[3], Sintija Bruže[4], Livio Conti[1], Thomas Fetsch[5], Serpil Koçdar[2], Sonja Intveen[3], Patriks Morevs[4], Olga Zubikova[3]

[1] Università Telematica Internazionale Uninettuno, Italy
[2] Anadolu University, Turkey
[3] Fachhochschule des Mittelstands, Germany
[4] Liepaja University, Latvia
[5] Proctorio GmbH, Germany

Innovative impact
Higher Education Institutions (HEIs) are successfully shifting to digital learning and teaching, anyway the online assessment is still a critical and much debated aspect. In particular, Online Proctoring is still relatively new within the European Union. Although this technology has the potential to greatly facilitate the management of academic online exams, ensuring the academic integrity and the process' quality, its adoption is quite complex as it requires specific new competences and the involvement of several actors in the process. The PROWIDE project, funded in the framework of the Erasmus+ project, has created a course to train of Online Proctoring Managers. The course, the first of its kind, intends to fill the skills gap by training and qualifying new professional figures capable of managing the proctoring process in HEIs.

Keywords: online proctoring, online education, e-assessment

Introduction

The COVID-19 crisis has brought attention to the issue of equal opportunities and accessibility in obtaining academic education, particularly through online platforms. While Higher Education Institutions (HEIs) have successfully transitioned to digital learning and teaching, online assessment, specifically online proctoring (OP), is still relatively new in the European Union (EU). However, OP has the potential to be a valuable tool for conducting professional testing remotely, thus increasing opportunities for individuals to obtain academic degrees without leaving home.

There are several reasons why online proctoring is not widely implemented in EU HEIs. These include concerns regarding data protection, compliance with educational laws, lack of adequately trained online proctors, and a general lack of awareness among internal stakeholders within HEIs, including management, teaching staff, administrative staff, and students. Even if an HEI decides to introduce online proctoring services, they often rely on external proctoring companies for technical expertise, without implementing a comprehensive approach to online proctoring within the institution. Consequently, the end-users of online proctoring services, namely students and teachers, often feel discouraged and confused by their experiences with online proctoring.

In this context, the PROWIDE project has been funded by the European Commission in the framework of the Erasmus+ programme. The project is coordinated by the Fachhochschule des Mittelstandes

(Germany) and involves three more Universities from Italy, Latvia and Turkey and an Online Proctoring provider.

The PROWIDE project aims to assist Higher Education Institutions (HEIs) in implementing high-quality online education, specifically focusing on remote exams, while ensuring academic integrity. The project recognizes that the successful introduction of online proctoring (OP) services requires the coordinated efforts of various stakeholders within HEIs, including managers, teachers, educational and exam offices, and IT departments. To facilitate this process, the project advocates for the role of an Online Proctoring Manager (OPM), who possesses an interdisciplinary skill set encompassing data protection, education law, technical expertise, communication with internal and external stakeholders, and management skills. However, currently, there is a lack of such professionals and training programs to qualify and recruit OPMs within HEIs.

In light of these challenges, the objectives of the PROWIDE project are as follows:

- To boost capacities for HEIs towards implementing holistic OP strategies;
- To raise awareness of HEIs stakeholders for OP services;
- To promote new job opportunities related to the management of OP services within different sectors by having a specific focus on HEIs.

Online Proctoring Manager qualification profile
The first activity of the partnership was to define a qualification profile for the OPM. It was created thanks to interviews and focus groups with experts in the sector at European level. This allowed to describe the OPM in terms of competencies, background and tasks.

The main competencies can for example be summarized as:

- To have general technical competence in ITC, network security and connectivity;
- To have specific competences in the use of the proctoring software and troubleshooting, as well

as knowledge of the proctoring process within the organization;

- To manage the legal aspects in the framework of the European GDPR regulation as well as the national laws. This aspect is crucial in order to have a responsible that can answer in a fast and effective way to the variety of questions that can daily rise in the on line proctoring.
- To have well assessed teaching experience in order to know the teaching requirements;
- To have an interdisciplinary culture in order to manage the various needs of different disciplines in carrying the exams;
- To have the proper communication skills in order to successfully interact with professors and students and to solve the critical situations.
- To have affinity to learn new systems, problem solving skills, patience.

In terms of background and expertise, according to most of the consulted experts, the OPM must have and IT background. He/she should have a detailed knowledge of all the internal university processes. He/she must know the regulation exam, the way the exams are conducted and, eventually, should have been a university student in the past. Eventually, he/she should have a background as project manager, too. Additionally, the OMP must be strategically located in the rectorate/management level. He will have to take binding decisions, with a high impact in the HEIs. So the OPM must hold a positions with high responsibility and high decision level.

It seems evident that such a profile, which combines technical (IT), legal, organizational and relational skills, with a specific focus on Online Proctoring, is generally not present in HEIs today.

Online Proctoring Manager training course
To fill the gap due to lack of training, once the professional profile was identified, a special training course was created. Table 1 shows the structure of the training course.

MODULES
1. Introduction to Technology Based/Enhanced Teaching (TB/ET) and Assessment
2. Role and Characteristics of Assessment Proctoring Systems
3. Technological Infrastructure
4. Legal Frameworks
5. Conflict Management
6. Project and Risk Management
7. Change Management
8. Personal and Social Skills

Table 1: Structure of the OPM training course

The course is structured in eight modules. The first three modules concern the more technical aspects, in terms of organization, technologies and hardware resources. The fourth module explores the legal aspects in detail. Modules five to seven cover OPM organizational and managerial skills, while the last module covers the necessary soft skills.

Each module has one or more units. Each unit includes an introductory video, followed by didactic material of a different nature (texts, presentations, ongoing verification exercises). All the didactic material is in English. There is also a thematic forum to stimulate discussion among course participants.

At the end of each module there is an evaluation test, the passing of which is required for the achievement of the OPM title. A very interesting aspect is that all the assessment tests are proctored online. In this way, the student of the course has the opportunity to experience firsthand the experience of taking a proctored exam and will be able to better understand the situation of future university students who will take part in proctored exams.

The course is designed in such a way that it can be included in the permanent university offer at the end of the project. The estimate is that the course is weighted at 6 ECTS, or an average of 150 hours of overall study.

By the end of the project, a European-wide pilot was conducted. On the one hand, this made it possible to validate and refine the training course, and on the other to qualify the first OPMs in the partner universities. To better understand the concepts of the course, the modules were accompanied by thematic webinars. From the evaluation questionnaires it emerged that, after the first hesitations towards the OP systems, the practice made it possible to overcome the initial difficulties.

The OPM trained in this way are able to organize and manage OP activities, communicate with students, teachers and administrators, solve technical problems and operate correctly from a legal point of view.

Acknowledgments

More information: proctoring-manager.eu

Conclusion

The PROWIDE project has implemented a set of activities to support the Universities in the digital transformation, and in particular in the adoption of automatic tools for the online assessment. Differently from other similar projects about online proctoring, generally focused on the use of the technology, it is has designed a competence framework for the Online Proctoring Manager, the staff member inside the University in charge of managing the proctoring process. Therefore, the PROWIDE project has designed the first training program able to offer a professional qualification about online proctoring, that can also be accredited as a regular academic course according to the Bologna Process, becoming part of the future permanent academic offer.

References

Robles, M., & Braathen, S. (2002). Online assessment techniques. *Delta Pi Epsilon Journal*, *44*(1), 39-49.

Dunn, L., Morgan, C., O'Reilly, M., & Parry, S. (2003). *The student assessment handbook: New directions in traditional and online assessment*. Routledge.

Gikandi, J. W., Morrow, D., & Davis, N. E. (2011). Online formative assessment in higher education: A review of the literature. *Computers & education*, *57*(4), 2333-2351.

Hussein, M. J., Yusuf, J., Deb, A. S., Fong, L., & Naidu, S. (2020). An evaluation of online proctoring tools. *Open Praxis*, *12*(4), 509-525.

Foster, D., & Layman, H. (2013). Online proctoring systems compared.

Woldeab, D., & Brothen, T. (2019). 21st century assessment: Online proctoring, test anxiety, and student performance. *International Journal of E-Learning & Distance Education*, *34*(1), 1-10.

Balash, D. G., Kim, D., Shaibekova, D., Fainchtein, R. A., Sherr, M., & Aviv, A. J. (2021, August). Examining the examiners: Students' privacy and security perceptions of online proctoring services. In *Proceedings of the Seventeenth Symposium on Usable Privacy and Security*.

Contributing Institutions

EADTU | The Netherlands
Hellenic Open University | Greece
Open Universiteit | The Netherlands
The Open University | The United Kingdom
Universidade Aberta | Portugal
(Open University of the) University of Jyväskylä | Finland
Universidad Nacional de Educación a Distancia | Spain
Universitat Oberta de Catalunya | Spain
Università Telematica Internazionale Uninettuno | Italy
Anadolu University | Turkey
Fachhochschule des Mittelstands | Germany
Liepaja University | Latvia

2023