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FernUniversität in Hagen | Germany
Eva Cendon

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Teija Lehto, Kristiina Engblom-Pelkkala and Sanna Sintonen

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University of Nicosia | Cyprus
Lefki Kourea

Other
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Foreword

The 6th Envisioning report for Empowering Universities in the uptake of new modes of teaching and learning

We herewith present to you the sixth edition of the EMPOWER Envisioning report. The report is set up by the expert pools of the EMPOWER programme established by EADTU to cover the latest trends and developments in new modes of teaching.

Digitalisation of education has become a reality for all higher education institutions. The COVID-19 crisis has however asked universities to make a more rapid switch. It has been a challenging process that asks for specific expertise in innovating education and new strategies and policies to support these developments. All realize that we need to move on from emergency remote teaching to more solid and research-based practices of quality online education. Most and for all not copying on-campus education, but use new modes of teaching to 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, engaging students

With the EMPOWER Envisioning report we want 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.

The actual implementation of innovative methods in teaching and learning requires institutional strategies and frameworks. A strong motivation of a professional teaching staff and continuous commitment from the top management of a higher education institution is needed to make this a success.

The Envisioning report is a selection of good practices and studies done by the experts connected to EADTU's EMPOWER programme. 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. Please find the EMPOWER website, covering 13 expert pools, at: empower.eadtu.eu.

In this 6th edition we cover initiatives related to: Digital Transformations in the (post)Covid Era (Chapter 1); Online and Distance Education (Chapter 2); Changing the Educational Landscape (Chapter 3) and Online Assessment (Chapter 4).

We are convinced the edition of the year 2022 is an inspiration for many to further innovate education and start cooperation and sharing of expertise with fellow innovators.

George Ubachs
Managing Director EADTU

01

Digital Transformations in the (Post-) Covid Era

Pedagogical leadership in the aftermath of the coronavirus pandemic

Kristiina Engblom-Pelkkala and Teija Lehto

Tampere University of Applied Sciences

Innovative impact

In the aftermath of the coronavirus lockdowns our society and the universities are reopening. The leaders and management teams in the universities are encountering the question how teaching and learning should be organized presently, and how in the future. This article emphasizes the necessity for pedagogical leadership in both instances.

The short term impact of this article relates to reflecting the present, paradoxical situation in which the pedagogical leadership of the universities appears to be right now. Some teachers and students want to return to the so-called good old normal and forget about the pandemic and online learning. However, learning and teaching in universities has changed for good during the exceptional times. This article also deals with long-term impacts of the current situation. A a concrete example of a long-term change is the emergence of hybrid teaching and learning. It will be essential in the context of new, flexible teaching methods and learning environments.

Keywords: leadership, management, covid-19, pedagogy, strategy, planning, hybrid learning

Introduction

Higher education has changed profoundly during the Covid-19 pandemic. During the lockdowns the doors of educational institutions were closed, and teaching was arranged mainly online, with the exception of a few specific laboratory exercises.

The reorganization of teaching has challenged teachers and lecturers to reform their own work, their pedagogical thinking, teaching and existing competences. The lecturers have been strengthening their digital skills, as teaching in classrooms has increasingly shifted to video-based classes and hybrid teaching. Introduction of new digital tools has become part of their everyday professional tasks.

In the aftermath of the Covid-19 restrictions, our society and universities are reopening, and the universities' leaders are encountering the question how teaching and learning should be organized in the future. When teachers and students have shared their opinion on this, the feedback from both sides has been contradictory.

Strategic pedagogical leadership creates the basis for day-to-day management

Universities are managed through strategy, and their operations are based on pedagogical leadership. Strategy and pedagogical leadership form the solid basis for planning the operations and finances of universities, as well as for increasing their competencies and knowledge capital.

Pedagogical leadership comprises managerial and administrational activities, and it intertwines both the management of things and the leadership of people. Leading people as a pedagogical practice means a series of different, theoretically based activities designed to support the ecology of educational environments and their community. (Male & Palaiologou 2015, 220.)

The concept of pedagogical leadership is usually applied in contexts where leadership is specifically related to educational institutions. This distinguishes pedagogical leadership from leadership in other areas. Leadership is a highly contextualised activity. (Davies & Davies 2005; Leithwood & Jantzi 2005.)

Our present article is largely based on the results of the Finnish report "Kartta pedagogisen toiminnan johtamiseen" (Map for pedagogical leadership) (2021). We also refer to our personal experiece of working in different pedagogical teams in higher education. Pedagogical leadership includes the leadership of the pedagogy executed in an educational

institution, the leadership of the pedagogical community, and management of both things and the people.

Pedagogical leadership aims at high-quality education

Pedagogical leadership aims at high-quality education and well-being of the working community. These factors systematically promote learning in the everyday working context of an institution, and they improve learning outcomes and increase satisfaction in the institution.

Functioning in the very core of the universities, pedagogical leadership relates closely to curriculum work, student guidance practices, pedagogical solutions that ensure the legality of activities, timeliness of the learning content, teaching methods and learning environments. Pedagogical leadership can play a significant role in meeting the demands of working life and developing competences of the teaching staff.

Within the process of pedagogical leadership, everyday learning is managed, ensuring that strategic goals are implemented in the core processes of learning and organization of education (Webb, 2005, 71). The pandemic experience has profoundly shaken our understanding how pedagogical leadership can be applied to guide the processes of university operations and to support learning. How can individual study paths be organized in the future? How should pedagogically functioning learning environments be built and maintained? How can we develop our teaching methods so that they support upgrading the skills of the teaching staff? In addition, how can we anticipate and assess the outcome of our pedagogical leadership in a world where hardly anyone can even predict the near future?

Longing for the good old normal

Pedagogical leadership stands in a paradoxical situation in higher education. Some teachers and students want to return to the so-called good old normal, and forget about the pandemic, online teaching and online learning. This group of people emphasizes that onsite education enables social encounters and makes it easier for the students to ask for and receive support from the peers and the learning community. There is no reason to deny this.

On the other hand, an ever increasing number of members of the academic community find that online and hybrid learning enables them to focus more intensively on the studies. Studying from home can also reconcile teaching, learning and the rest of your life. Working in the distance has been ecological due to the lesser need of travelling between home and the university. Those working or studying online have become aware of the benefits the new situation, and they prefer not to turn back to the practices excercised before the pandemic.

Among the basic tasks of the universities are studying, developing competences and supporting the well-being of students and staff. Within the sphere of teaching, pedagogical leadership itself can take the form of a learning process that produces the skills needed by individuals and working life.

Taking a retrospective view, how did we respond to the new situation? Were we ready to change and adopt new ways of working, or did we stubbornly stick to our accustomed manners, even if they did not support the profound objectives of higher education? Have we just been waiting for the situation to return to normal? These two extremes, and everything in between, can now be applied as building blocks of visualization of higher education in the future.

Personal experience and thought-enriching diversity

Our experience of ourselves as actors defines to a large extent how we assess the current situation and the future. How do we respond to change, and to what extent are we self-directed, or are we rather community-oriented, expecting support in learning from the people around us? Pedagogical leadership has its foundation on a learning organization, teams, and networks through which different people, things, and knowledge can be holistically managed. It can also promote communality, thought-enriching diversity, and innovation. (Kartta pedagogisen toiminnan johtamiseen 2012, 5).

Pedagogical leadership can act as a tool in reforming the university as an organization and a workplace. Pedagogy could increasingly be lifted in the focus of development and everyday actions. It should be entangled in planning, as well as teaching and studying arrangements.

Pandemic times and isolation have certainly highlighted the individual differences between students. We realize that we should consider the diversity of students in the teaching arrangements to enable best possible learning results for as many students as possible.

Pedagogical leadership behind flexible learning environments and methods

Organization of teaching and learning is closely related to the development and management of learning environments and methods. The pedagogical strategy can direct the development of learning environments and learning methods and enable new innovative types of implementation.

Learning environments and methods should support student-centered learning in a flexible way. Institutional development plans should take into account the flexible use of different, diverse learning methods. Flexible IT technologies can provide students with alternative and individualized learning opportunities in a variety of work-oriented learning environments.

Hybrid teaching typically combines synchronous face-to-face classroom teaching with distance groups of students. From the teachers point of view, it is generally considered a

very demanding method of teaching. This method requires that the teachers are both willing and well-trained to work with the latest digital education systems. Successful hybrid teaching requires resourcing from the educational institutions in new learning environments.

All this requires sufficient skills from the actors, in which technology, study counseling, pedagogical planning and collaborative networking play an important role. The universities cannot ignore their responsibility to develop the competences of their staff in using flexible and innovative learning environments and methods.

Conclusion

High-quality pedagogical leadership arises from the responsibility and cooperation of all those who are involved in teaching. Pedagogical leadership becomes essential, as we are transitioning to a new normal after the pandemic.

There is a need to rethink what pedagogical and learning environmental solutions can support learning and well-being of the students. The sometimes even stereotypical question of online versus face-to-face teaching has expanded, as hybrid teaching has gained ground during the pandemic as a useful and flexible teaching method.

Comparable examples

Hybrid teaching

"The term hybrid teaching refers to a classroom session that is attended remotely by some participants and in-person by others." (Teaching and Learning Centre 2022).

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The Internet: A New Renaissance for the University

Prof. Maria Amata Garito[1]

[1] International Telematic University UNINETTUNO

Innovative impact

The paper proposes a model using new technologies and knowledge alliances as an approach for innovating higher education at global level. This impacts in the short term products, technologies, organizational models and facilities. At long term, ICT-enabled knowledge alliances will act as a tool for academic and scientific diplomacy, developing cross-cultural academic programs, and supporting citizens and institutions promoting mutual knowledge and understanding addressing cultural, religious and policital differences.

Keywords: eLearning, Internet, Distance University, Academic Alliances, Covid-19.

Introduction

The drama caused by the Covid-19 pandemic has forced the world to become aware that technology, if well used, can rewrite new rules that allow for the creation of new models of University. Universities without boundaries that bring knowledge to everybody's homes with no more space and time limits.

The subjects that will treated in this paper will be:

- The Internet: A New Renaissance for the University
- Research for a new model of University
- Academic Alliances: A Global Strategy for Building the Future

The Internet: A New Renaissance for the University

The Covid-19 pandemic has forced all teachers to rely on the Web for teaching and communicating with their students. Almost all the universities in the world are currently knocking down their Ivory Towers using the Internet to carry out all teaching activities including remote exams.

In order to build an infrastructure for the XXI Century higher education, we ought to add a technological infrastructure to the universities' physical one. This will foster a new model of knowledge production and delivery.

A network of Knowledge Alliances will be possible by establishing consortia involving both universities and businesses from different parts of the world. Those Consortia promote the development of networks, meeting the educational needs of a globalized and interconnected society.[1]

The Universities in those Consortia, based on a robust organizational and pedagogic model, will cooperate in the joint production of contents for the online learning environments, bringing to life a new model of distance university. A distance university, integrated within the traditional universities, allows those to regain a crucial role in the innovation of products, processes and structures: products flexibility and adaptability, promotion of students' autonomy, changes to the teachers' role and the universities' structures.

The creation of a higher education global network, in which teachers and students from different places of the world participate in the collaborative knowledge construction, is not a utopia. Our International Telematic University UNINETTUNO was born from a Consortium of 41 Italian and 31 foreign Universities: which is Consorzio NETTUNO – Network per l'Università Ovunque.

A new pedagogical model was born thanks to UNINETTUNO University.

Teachers had to learn a new knowledge communication model for teaching through television and the Internet. University lecture halls became open structures where technologies allow a flexible training process and foster self and collaborative learning, both face-to-face and at distance. Today, thanks to UNINETTUNO, we built a technological network - as well as, a network of people, able to connect and share their knowledge being aware of cultural, political, religious and economic differences. Jointly, we developed and keep on developing common spaces, real and virtual, of

knowledge, shared academic curricula and shared psycho-pedagogic models that help harmonizing educational systems on a global scale.

Research for a New Model of University

The All this was achieved and developed thanks to the distance teaching model included into the Didactic Cyberspace of UNINETTUNO's platform: this is based on over 25 years of research and experimentation focused on technologies applied to teaching-learning processes. The UNINETTUNO University itself is a true research laboratory in which are analyzed hypotheses on teaching methodologies and languages, and students performances in their learning processes. These results are continuously assessed by scientists from various fields.

The design of the Didactic Cyberspace is based on a systemic approach. All courses from the various degree programs include digitized video lessons, indexed and connected by multimedia and hypertextual links to: texts, exercises and virtual laboratories - in order to promote the transfer knowledge through different modalities:

- From simple to complex (as in video lessons and intelligent library);
- From theory to practical application (like, learning by doing in the virtual laboratory);
- From guided exercises to content research on the World Wide Web;
- From individual study to an interactive dialogue between professors and students (as in collaborative learning through communication and sharing tools)[2]

The interaction between students and teachers coming from different countries is at the core of the entire educational process: jointly they develop collaborative and constructive learning by using interactive classrooms and virtual classrooms in immersive 3D environments. UNINETTUNO psycho-pedagogic model promotes the development of new Web ethics, reconsidering the teacher's role as crucial, as opposed to the usual tendency on the Web to disregard it. Therefore, a new telematic Professor/tutor's profile is defined: as Socrates did, with the Maieutic Art, the Professor/tutor guides the students along their learning path, also in distance education, teaching them not only how to do things, but also how to be.

The richness of cultural exchanges in the educational virtual spaces, among individuals belonging to different backgrounds, even few years ago was unpredictable, whereas, today UNINETTUNO's students come from 167 different countries.

Academic Alliances: A Global Strategy for Building the Future

In the present historical time more than ever, I think it is essential to enhance the cooperation in the fields of university and research. The dialogue among representatives of the academic world, the harmonization of higher education and research programs, the students and teachers' mobility – all of those, represent the unavoidable path to be followed to make intercultural dialogue become part of everyday life. We should all be aware that developing online educational contents, jointly with worldwide universities, is strategically important: it allows to develop the knowledge that helps all citizens to consider cultural, religious and political differences as a richness for humankind and not as tools of conflict and war. We cannot simply ignore conflicts taking place around the world because, due to the effects of globalization, they could have a more and more disruptive impact on our freedom.

Past experience confirms that it is possible to share with the universities belonging to different political and cultural backgrounds, common paths of reflection and thinking[3].

The interconnected intelligences of teachers and students from all parts of the world build new knowledge and develop a network not based on the imposition of the cultural models of one or the other, but based on the dialogue among different cultures and educational models.

Together we developed a true laboratory enabling younger generations to become drivers of change.

Conclusion

We should all be aware that this cooperation allows us to build a new balance between unity and diversity: unity of values and traditions that past memory conveys and diversity of cultures and languages. The XXI Century requires a new model of university: a virtual university under open skies, with no boundaries, a university where we build competences for development and lay the foundations for building the future together.

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02 Online and Distance Education

Online gamification devices as extensions of the educational printed book

José Bidarra[1] and Vitor Rocio[2]

[1] Universidade Aberta, LE@D, CIAC
[2] Universidade Aberta, INESC-TEC

Innovative impact

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

Introduction

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

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

The use of augmented reality (AR) technologies in the context of the printed book has also been arousing an enormous interest both from academia and publishers (Azuma, 1997). In recent years there have been several commercial products in the area of "augmented books" (e.g., *The Little Mermaid*; *Storybooks alive*; *Popar*), that is, books that use AR technologies to provide the reader with more layers of information, thereby fostering the use of the book in new ways.

Education in general, like any other human activity, has not been immune to the phenomenon of the "Internet of Things" (Gómez, Huete, Hoyos, Perez, & Grigori, 2013). The ubiquitous learning potential is reflected in increasing access to learning from collaborative learning environments and content supported by computers anytime and anywhere. It also allows for the right combination of physical and virtual spaces (Hürst & van Wezel, 2012).

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

gamification and digital content based on the printed book, mainly for educational purposes, supported by the Moodle learning management system.

A gamification model for augmented books

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

In order to develop a useful model, we built a learning environment based on the Moodle platform[1]. This is an open source learning management system with a huge user base around the world, and is widely used for distance learning. Founded on a social constructivist perspective, it is in fact a flexible enough system, to allow for the implementation of various pedagogical models (Pereira et al., 2008).

The main platform of the CHIC C3 project allowed for the creation of an "augmented" book and its connection via external interfaces to devices such as the Moodle platform. In this sense, the structure for the platform included the following modules:

- Users - provides user-type management features;

- Permissions Control - responsible for assigning permissions to various user types;

- Notifications and internal communication - provides functions of communication and internal collaboration, fundamental for a collaborative platform;

- Content Management - responsible for the storage, organization and availability of the content;

- Connection with Moodle - responsible for integrating and exchanging data with Moodle platform;

- Collaborative book project - this module provides all the collaborative and interactive authoring features for the "augmented" book;

- Web2Print - for digital printing of the book via Web;

- External API - the external API with a set of endpoints to enable the contact and transfer of relevant data, content, and information between the platform and external devices to extend the use of the traditional book (e.g.: Mobile devices and others that may arise in the future);

- Purchase - to manage the functionalities of purchase orders, payments and content subscriptions;

- Hybrid experiments - to manage the events of external devices.

The platform was integrated with external systems such as Moodle in order to provide specialized functionalities such as transmedia content, gamification strategies, interaction through augmented reality and context dependent, etc. The creation of communities around the book and the deployment of gamification and transmedia materials was done through Moodle.

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

- Comply with rules;

- Establish clear objectives and reward achievements through scoring systems or trophies (reward and return system);

- Launch interesting challenges;

- Develop the action according to difficulty levels in order to stimulate performances and promote the creation of plots/narratives and avatars.

Moodle has been proved a suitable platform for engaging students in learning activities through gamification features (Hasan et al., 2019), and for our goals, these plugins were included:

- H5P[2], providing rich interactive content types, including gamified activities:

  o Multiple Choice quiz;

  o Find the Words puzzle;

  o Drag & Drop;

- Game[3] plugin, with several game types, of which we used one for crossword puzzles;

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[1] https://moodle.org

- Level Up!, a block for tracking and displaying experience points (XP) and levels;

- Ranking table, to show a score board of students according to their achievements.

To further integrate information on the several platforms, we made use of the Moodle web service facilities to publish an API that provides data to be displayed in the CHIC C3 main portal.

For this purpose, web services in Moodle were activated. For some of the functionalities (e.g. displaying available courses), Moodle already provides core functions to accommodate those needs. Other functions needed to be implemented as plugin web services, using templates and standard Moodle programming directives.

As users register in the main portal, they can navigate to the Moodle platform without having to register or login again. Single sign-on is achieved through a mechanism based on the OAuth2 protocol, that Moodle fully supports, and an external federated authentication server.

In this way, we demonstrated a new, seamless way to develop a narrative on multiple platforms, increasing the learning and involvement of the potential user. This also helped achieve the integration of the traditional book into a universe of a transmedia narrative.

Conclusion

The increasing availability and use of books in the digital form has not replaced the printed form. Instead of viewing digital technologies as an alternative to a physical book we proposed a model for enhancing the experience of reading printed books, integrating digital content and activities that complement the actual reading.

The proposed model was based on basic principles of gamification and included online activities with challenges, complying with game rules, and establishing clear objectives and achievement rewards through a score board. The (inter)action was developed according to levels of difficulty in order to stimulate performances and promote the creation of narratives.

Through the use of Moodle and some of its gamification extensions (plugins), we were able to successfully integrate a digital dimension complementing physical books, for the benefit of the end user. Technically, the integration was achieved through the federated authentication of users, allowing them to login and navigate seamlessly among the various platforms, and a web service API for exchanging information on games and interaction in the Moodle platform,

further adding to the sense of seamless interaction with a single system.

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A Study about Online Experimentation

Jacobo Sáenz[1], Luis de la Torre[1], Jesús Chacón[2] and Sebastián Dormido[1]

[1] Department of Computer Science and Automatic Control, Universidad Nacional de Educación a Distancia, 28040, Madrid, Spain
[2] Department of Computer Architecture and Automatic Control, Universidad Complutense de Madrid, 28040, Madrid, Spain

Innovative impact

Distance education and online working are not new, however, nowadays the interest is increasing and so is the economic and human investment. For decades, researchers and teachers have been working to adapt laboratory practices to the distance education paradigm, creating and discovering new ways to develop, reuse and deploy online laboratories. However, despite all the hard work on this topic, the development and deployment efforts are still enormous. This work studies the technologies and means to build an online lab and select a set of combinations that reduce the problems that arise when creating online laboratories.

Keywords: Education, online laboratories, online lab architecture, remote laboratories, virtual laboratories

Introduction

Over the last few years online laboratories have changed the way of learning and teaching experimental science. However, the work began around two decades ago, and since then to nowadays multiple different design solutions have been developed. This enormous collection of solutions provides many combinations of technologies that allows to reproduce the feeling of real interactions with laboratory equipment, but it also implies that there are many ways to build an online lab with no clear winner among them.

Despite the increasing interest in online experimentation the question of which technologies are needed and how to combine them is not always an easy one. In this sense, the number of possible combinations makes the task of online lab development appear to be almost impossible at first. However, it is possible to summarise all the obstacles in three categories:

1. Technical complexity: The development and deployment of online laboratories is challenging due to the required technical resources and knowledge.
2. Lack of standardisation agreements: Even using standard technologies the architectures of such technologies are usually neither standard nor common. This is a known problem, and, in fact, there have been several attempts to build such standards, such as, Remote Interoperability Protocol (RIP) [1], Smart Device Specification [2], iLabs [3] and, the IEEE 1876 standard [4].
3. End-user requirements: Mobile devices have become the main equipment used to browse and consume resources from the Internet but are not the only one. Therefore, online labs should be accessible regardless of the platform, device, or operating system and without the need of new software.

This work takes into account the above-mentioned characteristic problems when using online laboratories in science, engineering and mathematics areas and aims to show some general guides to overcome these three obstacles.

Online labs classification

Virtual laboratories are software applications where all the elements of labs are simulated. For that reason, they are highly scalable, easy to deploy and allow a great degree of configuration that cannot always be obtained in remote systems.

Remote labs are those in which some elements are physical systems. In these labs, the provided data are real, they come from experiments with physical systems and, the interactions are performed through the Internet. In comparison with virtual labs, these systems are less scalable and more expensive. However, the added value of remote labs is that students can obtain and analyse real data from physical experiments.

There is a third group of online laboratories that is a combination of simulation and remote labs. These hybrid labs present real data along with simulated elements that display computer-generated information to enhance the user experience.

This classification is common in online laboratories, but it is also important to include two properties:

1. The place where data is produced adds new subtypes: local and remote acquisition.
2. The timing restrictions divide the classification depending on how critical the time is in the laboratory, adding three subtypes: Real-time, near real-time and batch labs.

Taking into account where the data are produced, how it is acquired, along with the three types presented before, we can conclude that a classic hand-on lab is a real, local, real-time or near real time laboratory. Consequently, online labs are those accessed through the Internet, including simulations with remotely served data.

Communications

The data acquisition and processing methods are out of the scope of this work. However, data format and communications conform the bond between the user (client) and the remote equipment (server) and the more critical the time is the more important is the bond between them.

To achieve a successful communication we need to define at least three things:

1. The format, that is the way the information is encoded, and must be recognised by both sides in communication.
2. The protocol, the set of rules that define how both sides are communicating.
3. The user interface, the graphical environment that allows the user to interact with the online lab.

The format

The lab systems need to exchange multiple data types, complex structures and metadata, and, to understand this information both sides need to define methods to encode and decode the data. Traditionally, developers use the serialisation and deserialization processes that entail two types of format: 1) byte arrays, light but not human readable messages common in object-oriented programming languages, and 2) plain-text, easy-to-debug character strings that are commonly language independent.

The two above-mentioned types are great solutions to format the information; however, due to their widespread use and availability, the plain-text formats make them great option. There are many plain-text formats, such as eXtensible Markup Language (XML) [5], Javascript Object Notation (JSON) [6], and YAML Ain't Markup Language (YAML)[7]. However, XML and JSON are present in the majority of web browsers, and using them as data formats allows developers to avoid two of the three obstacles mentioned in the introduction: reducing technical complexity and end-user requirements.

The protocol

A protocol is a collection of rules that define how a system communicates with another system. All the available protocols for transmitting information via the Internet can be used to create online labs. However, considering the nature of online labs, just a subset among all the used protocols can be relevant.

Many times, the selection of a protocol or another for an online lab is based on one or more of these technical requirements: latency, firewall traversal, coding requirements, user requirements, channel reliability and simultaneous communication. Next table summarises the characteristics of the three most used protocols in online labs are Hypertext Transfer Protocol (HTTP), Websocket, and Transmission Control Protocol (TCP):

Property	TCP	HTTP	Websocket
Latency	Very Low	Low	Low
Firewall T.	Low	High	Medium
Coding R.	Yes	No	No
User R.	Usually	No	No
Reliability	Reliable	Reliable	Reliable
Simultaneous	Full-duplex	Half/Full-duplex	Full-duplex

These three protocols are suitable to be used in online lab development; but, HTTP/HTTPS protocol has the best characteristics to avoid all the three obstacles presented in the introduction.

The user interface

The interface and its characteristics are continuously discussed topics in online experimentation, as there are many technological and educational dimensions to consider, most out of the scope of this work. Nevertheless, online labs recreate real systems and the graphical user interface adds a "touch and see" psychological effect of presence that may be as important as technology when developing these labs [8]. The most interactive designs are real representations of equivalent hands-on laboratories; some allow to control a lab as in a hand-operated system [9] or even to simulate the complete lab environments [10].

The computational power of mobile devices is increasing every day, therefore, is not the most important user requirement that must be met. Even more, sometimes the students' participation in the online lab depends on the software and hardware needed to run necessary applications. In this sense, plug-and-play approaches benefit the

engagement of students. The current trend shows that a good approach is to reduce the requirements to just web browsers, that are present in all devices and are flexible enough to support online laboratories.

Increasing the interactivity between users and online labs imposes certain restrictions, as an online lab can be used to perform a finite set of lab tasks. Adding new tasks usually implies modifications on both sides: server and client. Meaning that after the deployment of an online lab, it becomes harder to make modifications.

The presented situation illustrates the consequences of a high dependency between the user interface and the server side. Such dependency limits flexibility and increases the efforts when developing online labs. From this perspective, loose coupling of the client and server sides is desirable, and research revealed some common strategies to achieve it:

1. Using modular programming techniques.
2. Using a good Application Programming Interface (API), that defines how to use variables, remote calls, processes, data objects, and structures.
3. Follow the single responsibility principle on online experimentation, dividing the lab experience into small tasks, reducing the needed efforts to change isolated steps.

The large number of possibilities shown in the last sections and the decoupling approach together, provide the perfect breeding ground to obtain functional architectures for online labs that could overcome all the three obstacles presented in the introduction.

Conclusion

In this work, we presented the problems surrounding the creation and deployment of online labs and some of the most common and compatible solutions to each problem. The work intends to give a glimpse of a possible road-map to start the development of online laboratories.

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Community of Inquiry (COI) model for the improvement of distance learning

Alba Quirós, Alberto Izquierdo, Belén Ballesteros, Noemi Laforgue-Bullido, Javier Morentin-Encina, Héctor S. Melero[1.]

[1] Universidad Nacional de Educación a Distancia (UNED)

Innovative impact

The short term innovative impact to specific target groups related to our research project consists in being able to make methodological improvements in Distance Education based on the evaluations carried out by the students. Specifically, such modifications related to the design and supply of teaching materials, as well as the readjustment of the teaching styles of the teaching staff. In addition, it describes the long-term innovative impact. Consequently, we hope that these evidence-based adjustments will serve to improve social presence in distance higher education as a long-term innovative impact. Especially by increasing and improving the quality of interactions between participants and by improving learning materials.

Keywords: community of inquiry model, distance learning, teaching materials, social dimension.

Introduction

The Community of Inquiry model (CoI) is presented as an approach of great interest for the analysis of good educational practices in distance systems. The use of the CoI model as a framework for analysing online, distance and hybrid or blended learning contexts has its main roots in the proposal of Garrison et al. (1999), who formulated the theoretical model, which represents the process of teachers creating deep and meaningful learning experiences through the development of three interdependent elements: social, cognitive and teaching presences.

Based on this model, our objective is to identify, from the students' point of view, which aspects of the planning and development of subjects in the UNED degree courses are recognised as necessary to achieve a quality educational experience.

Methodology

The data collection instruments were the open questions of an evaluation questionnaire designed to collect, anonymously, voluntarily and online, the experience of the students. Specifically, we focused on the two open questions in this questionnaire: "According to your experience in this subject, what aspects of teaching would it be advisable to improve?"; "According to your experience in the Virtual Course of this subject, what aspects would you recommend improving?". Regarding the procedure, we selected six degrees offered by the UNED (English Studies, Art History, Environmental Sciences, Business Administration and Management, Social Education and Computer Engineering), considering: diversity of areas of knowledge, theoretical-practical character and number of registrations. For each degree, we selected the ten subjects, both compulsory and optional, best valued by students during 2018 and 2019. Of the 63,308 enrollments in the chosen subjects, 5,042 students completed the questions under study, constituting our study sample.

For the qualitative data analysis we used the software Atlas.ti (v8). The categorization initially followed a deductive logic, establishing the categories: "teaching attention", "methodology", "teaching materials", "assessment", "virtual tools", "associated center" and "tutor faculty". Subsequently, following an inductive approach, we identified 38 sub-categories that allowed us to answer our research questions.

Results

In this section we will comment on the main contributions obtained in relation to the dimensions most highlighted by the students' responses: Teaching Attention and Teaching Materials.

The commentaries of the students point out the importance of the Teacher Relationship in achieving satisfactory academic results (fr= 260). The favorable assessment of the interventions by teachers and tutors who respond with agility, explaining concepts and resolving doubts stands out. Students appreciate these interactions as evidence of teaching dedication and vocational projection (Santiago and Fonseca, 2016; Alonso Martín, 2019): Teachers of the highest rated subjects manage to transmit passion for the subject matter, motivating interest in learning it. The teaching presence facilitates a feeling of closeness, trust, accompaniment and encouragement, which allows overcoming some of the difficulties of distance methodologies.

The role of teachers and tutors as study facilitators is clear, as has been demonstrated in the associations between the social component and self-perceived learning (Richardson et al., 2017). However, the answers raise new questions about the pedagogical and didactic model. In this sense, we highlight two different positions: a part of the commentaries reinforce an interest in a teaching model oriented towards autonomous learning; the intervention of teachers and tutors would be situated in giving response and support to individual needs that allow progress in the self-regulated study by the student himself. On the other hand, a second group of commentaries focuses on the socio-constructivist approach, indicating the importance of a teaching relationship that favors the participation of the group of students. The teaching relationship stands out as an activator of collaborative teaching-learning processes and reinforce the cohesion of the group.

In terms of teaching materials, this category received more than twice as many comments as the next most mentioned category, Methodology/Approach, and almost three times as many as the third most mentioned category, Support to the Teaching Team. This number of comments gives us a clue as to the importance that learners attach to teaching materials in the distance learning process.

In turn, the commentaries have been sub-classified into three types of teaching materials: Basic Text, Didactic Guide and Other Teaching Materials. Furthermore, we identified five aspects to which the students allude in relation to these materials - thematic categories-. These categories refer to the Currency of the material, its Length, its Suitability, its Insufficiency and its Accessibility.

When looking at the Teaching Materials category in relation to the types of materials, we find that the subcategory that received the most comments is Other Teaching Materials (fr=717) followed by Basic Text (fr=362) and, with far fewer comments, Teaching Guide (fr=30). The most interesting conclusions for the improvement of distance learning teaching materials are to be found in the categories Basic Text and Other teaching materials.

Regarding the Basic Text, Suitability is one of the aspects most pointed out in the comments. The students show the need for the basic text to address the contents required to acquire the contents and competences proposed by the subject. They make special mention of the didactic capacity of the text: the explanations should not be contradictory, that they should be precise and easy to follow and the content should be well structured and adapted to the evaluation criteria.

Since the Other Teaching Materials subcategory is the most widely commented upon by students, suggesting improvements and the incorporation of new materials. Most of these comments speak in general terms and do not go into specifics as regards which resources, they are referring to. However, some of the resources mentioned are: practical exercises, multimedia material, summary material, supplementary material, debates in the forums, self-assessment test.

Conclusion

The results of the research presented here provide suggestive and relevant clues about the Teaching Relationship in order to rethink distance teaching-learning processes mediated by technology, particularly in Higher Education contexts. The analysis and interpretation of the students' answers to the evaluation questionnaires of the subjects, allows us to identify the centrality of the social dimension to generate a satisfactory learning environment. In this sense, the ability of teaching figures to generate interactions, from a position that is perceived as close, will be one of the keys to facilitating feelings of belonging or bond to a learning community. Likewise, Teaching Materials emerge as another central element to guide a socio-constructivist practice of learning in distance education scenarios.

However, this last topic is an aspect not sufficiently explored from the CoI Model. Consequently, future research may be aimed at introducing modifications to the CoI Model that help to assess Teaching materials more explicitly, since it seems to be a particularly important issue for students. This could also facilitate the verification of the possible influence of more appropriate and interactive Teaching materials on the social presence, in its relationship with the teaching and cognitive presences.

Comparable examples

E-xcelence https://e-xcellencelabel.eadtu.eu/e-xcellence-review/manual

Digital Technologies Hub https://www.digitaltechnologieshub.edu.au/

Edu Bits.Pedagogical experiences and good practices in teaching. From teachers to teachers. https://observatory.tec.mx/edu-bits

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Active participation in synchronous online learning

Karen Kear[1], Cathryn Peoples[1], Helen Donelan[1] and Jon Rosewell[1]

[1] The Open University, UK

Innovative impact

Online synchronous education has recently been vital in replacing face-to-face teaching during the pandemic. Although there is increasing use of synchronous technologies in higher education, there are still challenges which need to be addressed. The most significant of these is lack of active participation by students. Even where educators are experienced in running synchronous online learning sessions, previous research has shown that these sessions tend to be didactic in nature, and interactive elements are often not used. Students' unwillingness to use audio or video channels is one factor, which denies educators the non-verbal feedback intrinsic to face-to-face teaching. In general, there may be a lack of student engagement, with students attending but in a passive capacity, with a reluctance to contribute.

There is a need to address two related challenges: designing synchronous online sessions which have active learning built in; and overcoming students' inhibitions regarding active participation. This article discusses these topics, based on prior research and practice. It then briefly presents selected data from a student survey at the UK Open University. The survey collected quantitative and qualitative data to gain an understanding of students' experiences and views about online synchronous sessions: for example, what value do students place on active participation, and why? The aim of this investigation is to make online synchronous learning more interactive, engaging and effective.

Keywords: synchronous, online, participation

Introduction

In online learning contexts, active participation is believed to be fundamental to student success and educational quality (Caliskan, 2020). Students consider active participation to be important, and particularly value learner-to-instructor interactions (Martin & Bolliger, 2018). In this article we focus specifically on active participation in synchronous online learning sessions. Banna et al. (2015) found that students value opportunities to join synchronous sessions, and the chance to interact with peers and their instructor.

However, active participation is viewed as less important by some online learners, who may not engage significantly during synchronous tutorials. This may depend on the fit between the students' conceptions of learning and the approach to teaching (Richardson, 2013); an active approach may only be best for students who believe this approach to be beneficial. Although teaching staff may be frustrated that students are not being more active, student satisfaction with synchronous online tutorials can still be high. Students may

feel that they are receiving a quality teaching and learning experience despite not interacting significantly with others during it (Butler et al., 2018).

There are many ways active participation in online tutorials can be encouraged, such as quizzes, well-timed questions, and text-based communication, as well as through the audio and video channels often associated with synchronous online tutorials. However, if students do not engage, tutors may feel unable to adapt their approach due to a lack of feedback from students (Rogers et al., 2021).

There are practical reasons for students not engaging with active approaches in synchronous online tutorials; they may not want to use audio and video communication if they are worried about the presence of family members in the background. The major reasons for preferring to keep a webcam turned off during an online session include anxiety, shyness, wishing to ensure the privacy of the home, and a fear of being exposed (Gherheş et al. (2021); Rajab & Soheib, 2021). If teachers can establish an empathetic environment, students will feel safer engaging actively. Teachers exhibit

empathy through their care, concern and understanding of a student's personal situation, while ensuring that the primary focus is student learning (Meyers, 2019).

Adobe Connect – a tool for synchronous online learning

Adobe Connect is one tool for supporting synchronous online education. Rogers et al. (2021) investigated participation in maths online tutorials using Adobe Connect, through polling, asking academic questions, and on-screen activities. There was high student engagement in all types of activity, although chat box activities were less favoured. Active participation was negatively impacted by low levels of confidence.

Torun (2013) examined the effectiveness of Adobe Connect Pro on a web programming course. Responses were largely positive: students believed that the live tutorials were beneficial for their learning, and they valued being part of a virtual learning community. In this study the layout of the virtual classroom was explicitly considered. This includes the view of the tutor, the main presentation content and the text chat area. One weakness may have been the lack of any views of students.

In a study by Englehart (2015), Adobe Connect enabled online students to join other students who were in physical classrooms. Students appreciated the convenience of the online sessions, but felt that the quality of interactions suffered, partly because none of the online students turned their webcams on.

The findings from studies using Adobe Connect as a tool to facilitate synchronous education are not specific to Adobe Connect, but generally relate to using any synchronous technology. With the 2020 pandemic, and the widespread use of other tools such as Zoom, Microsoft Teams and Google Classroom, it is expected that studies comparing different tools and their features will emerge.

Recent findings on active participation in synchronous online tutorials

Research at the UK Open University is investigating students' and tutors' perspectives on active participation in online tutorials, which take place in Adobe Connect. Because of the Covid 19 pandemic, all tutorials needed to take place online, rather than the mix of face-to-face and online tutorials offered previously.

A cross-university survey is providing insights into students' views on participative activities in online tutorials. These activities may include the use of Adobe Connect tools such as whiteboard, polls and text chat. One of the survey questions asked students who had taken part in such activities whether they found them valuable. Of the 511 responses, 69% said that they did, while 10% did not; the remaining 20% were unsure.

Following this question, respondents were asked to explain why they thought the activities were, or were not, valuable. The wordcloud in Figure 1 illustrates the content of the 282 responses to this supplementary question.

Figure 1 Wordcloud of student responses on the value of activities

For example, one respondent said:
"I find that study on my own can be quite isolating - to hear others interpretations of materials is thought provoking."

Another commented:
"Opportunities to answer questions allows you to see if you are understanding. If not, you can ask for clarification."

However, other students commented on the more negative aspects of activities that they experienced; for example:
"If you have something to contribute, they have value. If not, then they're stressful, and you end up feeling a bit stupid."

Even from this early data, it is clear that there are a variety of perspectives from students on the benefits and difficulties of active participation in synchronous online learning. We will be exploring our data in more depth to investigate this further, in order to maximise the benefits for students, and address the problems.

Conclusion

The benefits of active participation in synchronous online sessions have been highlighted in several studies. The opportunity for students to interact with other students and their teachers can enable them to feel part of a learning community, to hear other people's views, and to clarify their understanding of a topic. However, the perceived value is also strongly related to students' beliefs about learning approaches, and active participation can be a cause of stress. Work continues to understand how to encourage and support students and teachers in these environments.

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EU Projects Going Virtual — The ONE Meeting Approach

Eva Cendon[1], Päivi Kananen[2], Virpi Uotinen[2], and Laura López-Forés[3]

[1] FernUniversität in Hagen (Germany)
[2] University of Jyväskylä (Finland)
[3] Open Evidence SL (Spain), Universitat Oberta de Catalunya (Spain)

Innovative impact

The ONE meeting approach aims to equip EU project managers and HE leadership with skills and competencies needed for making EU projects more efficient, greener and more sustainable. Our target groups can pick out what is relevant for them: The ONE Business Case provides evidence and offers tools to check the potential benefits for the environment; the ONE Virtual Toolkit offers a systematised collection of tools for virtual collaboration; and the ONE Guide presents a proof of concept and a step-by-step approach for switching to a ONE meeting only format.

In the long run, we hope to impact project work on a regional, national and international level to become more sustainable and effective, while still focusing on the social and personal factors as well as mutual cultural understanding. We see project managers and leaders who use our resources for their own work as possible change agents. Following this, we hope to see our outcomes further developed, enriched and undergirded by our target groups through their own experiences, their innovative practices as well as their successes and failures. We are aware that what we have achieved is only a first step towards a sustainable, green and smart approach in transnational collaboration. Many more steps have to follow – supported by the experiences of projects using the ONE approach and by EU policies advocating a greener and more sustainable Europe.

Keywords: virtual collaboration, sustainability, green transition, virtual tools

Introduction

The European Union and national governments have adopted ambitious environmental goals towards a climate-neutral EU by 2050. However, face-to-face transnational partner meetings, and related high levels of pollution due to cross-border travelling, are typically a key component of EU project collaboration in higher education.

The ONE Meeting Project is an Erasmus+ initiative, funded under the 'Key Activity 2. Strategic Partnerships for Higher Education', running from December 2020 until November 2022. The ONE consortium is formed by seven partners from seven different countries (i.e., Germany, Belgium, United Kingdom, Ireland, Italy, Spain, Finland) and includes four universities (FernUniversität in Hagen, University of Jyväskylä, Universitat Oberta de Catalunya, Università degli Studi di Milano-Bicocca), two business partners (Canice Consulting Ltd., Momentum) and the European Association for University Continuing Education (eucen). The project is coordinated by the FernUniversität in Hagen in close collaboration with EUCEN.

The ONE Meeting Project explores virtual possibilities of collaboration for designing or working on EU-funded transnational projects, and raises awareness about how virtual collaboration can substitute face-to-face meetings but also face-to-face work in general. Our approach favours a dynamic and digital form of collaboration that is in real time and teamwork-oriented. It aims at providing evidence, tools and resources for switching to the ONE meeting only format. Within ONE, all partners are both actors and investigators of our experiences from virtual, collaborative work in a transnational project. As a consortium, we will show how to run transnational projects with only ONE transnational partner meeting by achieving it ourselves through the project and sharing the lessons. Our own experiences are complemented both by an early consultation of 38 project managers of EU projects and their experiences with virtual collaboration as well as by user testing and user participation in each step of our project to countercheck our results. In this article, we will present central outcomes of our project work encompassing the ONE meeting approach: (1) The Business Case for ONE Meeting Projects in Europe, (2) The ONE Meeting Project Virtual Toolkit and (3) The All-You-Need-To-Know Guide to Running ONE Meeting Projects (see Figure 1). Finally, we will point out important criteria that are based on our experiences so far.

Figure 1: The three ONE Meeting Project Outputs

The Business Case for ONE Meeting Projects in Europe

In general terms, it has been argued that online meetings are less efficient for several reasons: First, casual social interactions are less likely to occur; second, workers lack knowledge about the existing tools to conduct online meetings[1]; third, there is the fear of losing visibility and networking opportunities[2]; and fourth, online meetings go against organisational culture[3]. However, experts in the field have identified various good practices that could overcome these barriers to conduct optimal online meetings, such as replacing coffee breaks with 'Chat Roulettes' or organising 'virtual lunch tables' or 'speakers' lounge' rooms[4]. Others have suggested using polls, surveys, virtual whiteboards and trivia to foster engagement in small group sessions[5]. On top of this, virtual meetings offer several other positive impacts such as allowing for a higher level of diversity in participants or a reduction in the cost and time losses due to travelling[6]. Most importantly, the implementation of the ONE meeting only format enables European projects to reduce their environmental footprint. There exists a growing body of literature that looks at the environmental cost of physical meetings, conferences and seminars[7]. In the framework of this project, with the Business Case for ONE Meeting Projects in Europe[8] we have provided evidence on the gains of switching to our proposed model. In particular, we calculated the environmental cost in terms of CO_2 emissions for the project under the ONE meeting scenario, and under the normal scenario, in which all meetings are held physically. The results exhibit a difference of 10 tons of CO_2 emissions between the all-physical meetings scenario and the ONE project model. Additionally, we showed the environmental gain from 13 EU projects in which partners in the consortium were involved. The switch to the ONE meeting only format would result in an overall reduction of 160.7 tons of CO_2 emissions.

The ONE Meeting Project Virtual Toolkit

The ONE Meeting Project Virtual Toolkit[9] is an easy-to-use collection of virtual tools. It presents a selection of usable virtual tools for project staff in EU projects. Because the target group of this project is higher education professionals in the European Union area who work in cross-national projects in management, administration, research or technical support, this target group was also used as an informant of the virtual tools needed in collaboration and co-creation in various phases of transnational projects.

The creation of the Virtual Toolkit included several phases. First, a total of 38 EU project professionals from 18 countries were contacted with a request to list their favourite virtual tools used in different project phases in transnational projects. In addition, seven partners in the ONE Meeting Project complemented this tool list with their own favourites. The six tool categories of the Virtual Toolkit were created based on this data collection, the categories being: (1) Project Management Tools, (2) Collaboration and File Sharing Tools, (3) Research Tools, (4) Meeting and Webinar Tools, (5) Polling, Presentation and Animation Tools and (6) Digital Content Creation Tools.

The final selection of 23 tools for the Virtual Toolkit was based on the ranking of the tools selected by the partners using the following criteria: usability, universal design (accessibility) and price. Further feedback for the Virtual Toolkit was collected through pilot testing both internally among project partners and externally through 48 professionals working in projects in the field of higher education in EU countries. The final version of the Virtual Toolkit was edited based on this feedback.

The All-You-Need-To-Know Guide to Running ONE Meeting Projects

The All-You-Need-To-Know Guide to Running ONE Meeting Projects[10] (ONE Guide) complements the ONE Business Case (which provides evidence on the benefits of our approach and focuses on raising awareness) and the ONE Virtual Toolkit (which presents a systematised collection of tools for virtual collaboration). It aims at project managers who need to or want to change the way of conducting transnational projects and provides a step-by-step approach to implement transnational projects with just ONE meeting. To achieve this, our experiences in ONE as well as learnings, failures and successes of our own work are cornerstones of our proof of concept – paired with valuable experiences and resources from outside the ONE consortium.

The ONE meeting approach consists of three components:

1. Agile project management: a way to continuously assess and reflect on project development
2. Sustainability: contributing to sustainability on the project level and within partner organisations
3. Accessibility: understanding accessibility as a relevant part of virtual collaboration

Furthermore, the ONE meeting approach offers tips and advice for making a difference in different phases of an EU project, outlining a step-by-step approach on how to manage and conduct your project with ONE meeting only: from proposal development, project planning and

implementation to dissemination and exploitation to quality assurance and evaluation. An integral feature is the ONE meeting itself: This face-to-face meeting is of special importance for the partnership and could take place at different stages of the project – as a kick-off at the beginning, for re-bonding and mid-term evaluation in the middle of the project or as a closing event and a possible start for new collaborations at the end. Within the ONE Meeting Project we had plans for this ONE meeting for each of these stages of the project. Due to the circumstances, we now hope to have it as the closing event of our project.

Conclusion

While developing the ONE meeting approach within our own project work, we determined some important criteria – based on our own experiences – that could serve as prerequisites for transnational EU projects following this approach. They are closely connected to collaboration and communication and need to be considered to successfully implement such an approach.

Firstly, *personal and social aspects* are of high relevance when it comes to virtual collaboration. Partners need to have spaces of informal social exchange. Secondly, a clear and transparent *communication paired with social presence* from the project coordinator helps the partnership to stay connected and attuned. Thirdly, the *inclusion of intercultural experiences and understanding* has to be thought through when collaboration and communication is mostly taking place online; it is not enough to pin it solely on the ONE meeting. Another criterion is the *allocation of time and exclusiveness for virtual collaboration.* Because one central threat to online collaboration is digital or Zoom fatigue, it is important to rethink online and offline working and to carefully decide about synchronous and asynchronous work and collaboration. And last but not least: Successful *online meetings require effort* – both didactically and technically.

Comparable examples
The Creative Change project develops a set of resources to support project managers and staff to embrace creative, people-centred and impact-oriented practices. Creative Change is funded under the Key Activity 2 of the Erasmus+ Programme (project nº 2020-1-AT01-KA227-ADU-092553). Read more: https://creative-change.eu/

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03 Changing the Educational Landscape

Bridging the 10% Gap: The Need for Blended Learning Approaches for Refugees, Migrants, and International Protection Applicants

Prajakta Girme

Dublin City University

Innovative impact

According to the recent data from the UNHCR, there are currently 79.5 million forcibly displaced people around the world. As of 2022, 5% of refugees have access to higher education compared to only 1% in 2019 (UNHCR Tertiary education, 2022). The UNHCR aims to achieve 15% enrollment of refugee learners in higher education by 2030 (UNHCR, 2019). One major barrier to achieve this goal is access. Digital learning could play a crucial part in providing access to education while also being a cost-effective and scalable approach. However, a study by Castaño-Muñoz et al. (2018) showed that digital learning tools alone were considered "exclusionary" rather than "inclusionary" by refugees and migrants. Refugees and migrants still regard 'traditional', on-campus mode of delivery to be more 'useful' (Castaño-Muñoz et al., 2018). A blended learning approach to education that combines online education and opportunities for community engagement with traditional classroom-based methods could be key to addressing barriers. Blended learning initiatives, incorporating well-designed online experiences, targeted towards supporting the complex needs of refugees, migrants and international protection applicants are the need of the hour and could be determinant to fostering inclusive education throughout Europe.

Keywords: Blended learning, refugee education, higher education

Introduction

The report explores the potential of blended learning in opening access to higher education to refugees, migrants, and international protection applicants. It briefly identifies some of the unique challenges facing these learners and sets out to illustrate how new models of blended provision could be designed to help meet their needs.

Blended Learning in context

Among the multitude of definitions of blended learning and the ambiguity in applied contexts, the most accepted deifnition refers to blended learning as a combination of online and face-to-face delivery (Bonk & Graham, 2012). In the context of refugee, migrant, and international protection applicant education, it meets the seldom addressed 'inclusionary' need (Castaño-Muñoz et al., 2018) of face-to-face learning combined with the favourable accessibility options afforded by the online delivery. The essential focus on access should not overshadow the vulenrable community's need for a sense of belonging.

A Need for Community

Learning needs of the forcibly displaced community should be addressed for their unique circumstances (Castaño-Muñoz et al., 2018). However, as frequently as education has been cited as the essential component of refugee integration, it still lacks in terms of creating a space for community within the institutional walls. Consideration for the human factor beyond the statistic is vital to successful inclusion and promoting equity. According to Risberg (2021), international protection applicants and refugee initiatives and learning supports fall short of adequately addressing non-citizens. Risberg (2021) states that the conversations and implementations of approaches for migrants and refugees within the existing approaches are merely superficial and do not promote inclusion but rather held as 'exemplars of the 'other'' (Risberg, 2021). The need for effective inclusionary

approaches to foster global citizens has been highlighted by stakeholders. An inclusionary approach based on human rights is deemed necessary for migrants and refugees or they might 'remain global non-citizens' (Risberg, 2021).

In 2021, College Connect and Irish Refugee Council led a Community Needs Analysis (CNA) addressing the barriers faced by refugees and people in the asylum process in accessing further and higher education. The research was a peer-led initiative which highlighted community as the centre of research. With over a 100 participants sharing their stories on the international protection process, the study delves into the lived experiences of the community and its struggles to access higher education.

Numerous barriers like the financial requirements, recognition of prior learning or qualifications and a lack of accurate and targeted information about education opportunities were highlighted. Many participants articulated the system of Direct Provision was a physical and mental barrier to education (Sartori & Nwanze, 2021). The participants reported "feelings of isolation on campus, to deferring or losing college places due to limited finances or simply living too far away from college" (Ried, 2021)

The need for community in the field of digital education can be met through blended learning approaches (Halkic & Arnold, 2019). The blended learning approach of combing face-to-face learning opportunities in online education has been reported to be ideal (Colucci et al., 2017). A study by Fincham (2017) records that students in low resource environments like refugee camps and international protection accommodation students prefer face-to face education as opposed to online. The students, especially female students, also preferred face-to-face learning opportunities as it enabled respite from difficult living situations prevalent in the refugee camps (Fincham, 2017).

Refugees, migrants and international protection applicants are a vulnerable target group with complex needs that need structured support (Castaño-Muñoz et al., 2018). In the study of Free Digital Learning (FDL) by Castaño-Muñoz et al. (2018), the focus group participants consisting of refugee and migrant population agreed that face-to-face learning was ideal and the online aspect of blended learning could be considered a 'potential compliment'. The face-to-face element was considered important by the participants to build networks with the local community and others in similar situations. A blended and guided format with various stakeholders was considered vital to the success of FDL. Another factor explored in the study was the aim to achieve civic integration, most refugees and migrants did not consider FDL tools to be a means of support for civic engagement.

Conclusion

Rising up to the challenge of providing well-guided structure, supports, and access opportunities in higher education, especially under the current global circumstances, is essential. If we are to truly bridge the gap between current realities of higher education and the goals that we envision for meeting needs of forcibly displaced population we must look at blended learning as one of the critical options. Indeed, if evidence and needs analysis is key to scoping the refugee and migrant landscape, we will need to harness the flexibility and affordability of blended learning approaches to education. Effort to foster understanding and promotion of blended learning platforms and tools is essential.

Consideration for community needs, especially one as vulnerable as refugee and international protection community, is vital to successfully achieve 15% enrollment of refugee learners in higher education by 2030 (UNHCR, 2019). Access to higher education and civic inclusion need not be separate issues to tackle as blended learning can lead the way to integration of the two fundamental needs. As states, online aspect of blended learning offers flexible, cost-effective, and scalable approach while the face-to-face sessions provide networks of civic engagement at various levels. A balance between the reach of the online and the comfort of the community, both virtual and on-campus, is key. The needs of the refugee, international protection applicants and migrant community are complex and therefore require specialized support. Blended learning could be the scaffolding that supports and promotes equity practices at a global level.

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Designing and implementing blogs in English second language learning

Silvia Sánchez Calderón[1] and María Ángeles Escobar Álvarez[2]

[1/2] National University of Distance Education

Innovative impact

This paper discusses the design and implementation of an institutional blog that hosts a repository of online and open access grammar checkers with the objective of fostering the development of autonomous learning through the acquisition of skills related to the self-correction of written essays in English. Examples of these tools include Grammarly, ProWriting Aid, PaperRater or Writing Assistant, among others. This repository is hosted in an institutional blog at the National University of Distance Education (UNED), and each grammar checker is structured as follows: (a) a brief description of the tool; (b) the main functionalities that each tool offers for the self-correction of English texts with the visual support of a checklist; and (c) a short video tutorial. The main distinctive feature of these video tutorials is that they have been designed, taking as a starting point a corpus of English written texts produced by undergraduate students of Instrumental English I and II of the English Bachelor's Degree and Modern Language I. Foreign Language: English of the Spanish Language and Literature Bachelor's Degree. Thus, this institutional blog aims to contribute to the expansion of innovative digital resources that will help both English second language learners in the development of their written competence and self-correction of errors and English language teachers in the implementation of online Information and Communication Technology tools in the classroom.

Keywords: blog, online grammar checker, self-correction, written production, English language, self-learning

Introduction

This paper aims to discuss the design of a grammar checkers' repository that allows users to detect and self-correct written texts in English. These grammar checkers are available online and they are open access. This repository will serve as a self-learning resource for the acquisition of written production skills in English second language learners, in general, and undergraduate students enrolled in Instrumental English I and II of the English Bachelor's Degree and Modern Language I. Foreign Language: English of the Spanish Language and Literature Bachelor's Degree, in particular, following the distance learning at UNED.

This repository has adopted an institutional blog format, and hosts a wide range of online tools that allow users to detect errors in English written texts. Examples of these tools are Grammarly or PaperRater. This blog's users are expected to help English learners to exploit the use of one or several grammar checkers depending on the learners' self-correction needs in their written compositions and the functionalities that each tool has. For example, while Grammarly detects spelling, grammatical and puntuation mistakes, PaperRater suggests alternative lexicon. The chief distinctive features of this repository involve (a) a visual checklist with the functionalities of each grammar checker (for example, sentence length or detection of repetitions); and (b) short video tutorials that explain how each tool works using real examples derived from a corpus of English written texts that has been compiled in the academic courses 2019–2020 and 2020–2021 in the three modules.

The resources of the repository are presented in Spanish with the objective of spreading the use of the blog not only among students enrolled in the modules for which this blog is addressed to, but also among any area of expertise (for example, economics or law). Therefore, this blog will foster self-learning in self-correcting errors in English writing.

State of the art

Students unavoidably produce errors when acquiring English as a second language (Al-Ahdal 2020; Ellis 2008). These errors provide students and teachers with information related to what and how much they have learned and they serve as resources through which students find the principles that allow them to meet the objectives required in the acquisition of English.

In order to guarantee an efficient teaching and learning process, teachers are prone to use different methodological strategies to detect and analyze students' errors. To date, there is a tendency to understand the error detection task as a manual job that teachers should carry out (Al-haysoni, 2012; Hameed, 2016). Nevertheless, previous studies have evidenced that software programs or online applications focused on detecting and self-correcting errors have turned out to be effective in the process of learning English and, therefore, these applications have proven to help students in learning effectively (Al-Ahdal 2020; Botley and Dillah 2007; Díaz-Negrillo and Fernández-Domínguez 2006; among others).

Error analysis aided by an Information and Communication Technology (ICT) tool is an effective pedagogical strategy for the acquisition of the linguistic competence, in general, and in the development of English written production skills, in particular. Previous works have reported that English learners experience a challenge in acquiring written skills when compared to the other linguistic skills such as oral production, listening comprehension or reading comprehension (Al-Ahdal and Al-Ma'amari 2015). In other words, written texts produced by English learners present more errors from a quantitative approach (number of errors) and from a qualitative perspective (type of errors). However, it is widely known that error analysis plays an important role in second language acquisition given that it reveals potential interferences from the learners' first language (Zhang 2010). Therefore, the analysis of errors detected by an ICT tool serves as a pedagogical and didactic stimulus since it focuses on the development of self-learning skills in the production of written texts. In turn, online applications that detect errors automatically account for the type of error produced, which leads students to be conscious of their own errors and correct them on the basis of the feedback provided by the ICT tool that is being used for that purpose. Likewise, automatic tools of error detection contribute to the development of corpus linguistics through a robust analysis or the most frequent errors and their nature in English written texts, and its use helps the acquisition of self-learning skills since the student is conscious of his/her own learning process (Mushtaq 2019). Besides, these tools allow students to repeat the correction process of their own texts as often as required until developing a written text that lacks grammatical, lexical or content errors.

Following Roblyer (2003), students and teachers lack training with respect to how ICT tools applied to learning and teaching English work, and, in particular, those ICT tools that analyze errors in written productions automatically, as available online and open access for the educational community. Indeed, Al-Ahdal (2020) concluded that detecting errors produced in academic texts by English second learners was more effective through the use of Grammarly when compared to the number of errors detected via a manual process in which this type of ICT tool was not used; thus, the findings of this study proved to be a tedious task particularly in classrooms with a high number of students.

Taking as a starting point the studies discussed above, this paper proposes strategies that strengthen the acquisition of English production skills through the use of online and open access self-correction tools that focus on this learning and pedagogical aim. These tools will be collected in a repository that is hosted in an institutional blog at UNED. The blog will serve as a resource that supports and aids the process of developing written production skills in English through the display of video tutorials that show real examples of students' compositions and checklists designed by the teaching team of the Innovative Didactic Group for Open Linguistic Glossary Applications (OLGA, GID2018-3).

Methodology

Following Al-Ahdal's (2020) classification, 11 online and open-access grammar checkers have been included in the repository of tools that detect and self-correct errors in English written texts. As shown in Table 1, these tools are the most frequently suggested grammar checkers in the process of teaching and learning English as a second language. The repository is available on the following link: https://blogs.uned.es/herramientasautocorreccionescrituraingles/.

Table 1. Frequently suggested online and open access grammar checkers (based on Al-Ahdal 2020, pp. 421-422)

Grammar checker	Example of functionality
AutoCrit	Detection of an overuse of adverbs
Grammarly	Detection of syntactic errors
Hemingway	Detection of sentence semantic interpretation
LanguageTool	Detection of grammar errors
OutWrite	Detection of spelling errors
PaperRater	Detection of punctuation errors
ProWritingAid	Detection of grammar errors and it offers suggestions to improve grammar style
Reverso	It offers more than one alternative of writing style
Slick Write	Detection of errors, regardless of their nature
Spell Check Plus	Detection of errors at different levels and it provides with feedback focused on the reasons that underlie the errors produced
Virtual Writing Tutor	Detection of lexical errors and it offers alternatives in selecting vocabulary

The content of each of the 11 grammar checkers in Table 1 is published in an institutional repository that adopts a blog format. In particular, each tool includes the information detailed below:

1. A brief description of the tool
2. A checklist that includes all the functionalities of each tool. This checklist has been designed by Canva using the pattern available in the following link: https://www.canva.com/design/play?template=EADah7BvIvg&category=tADYj59IvcE&type=TACQ-j4WGew. Image 1 shows an example of a checklist with some functionalities of Grammarly.

Image 1. Checklist of Grammarly functionalities

Funcionalidades de Grammarly

- ☐ Errores gramaticales
- ☐ Ortografía
- ☐ Léxico
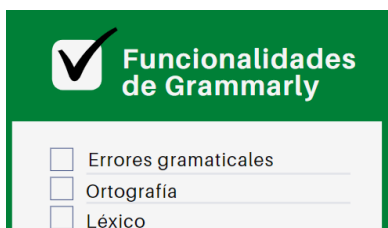
3. The content of each tool is presented in short video tutorials recorded at UNED. The distinctive property of these video tutorials is the use of examples taken from a linguistic corpus that collects written texts produced by students enrolled in Instrumental English I and II and Modern Language I. Foreign Language: English in the academic courses 2019–2020 and 2020–2021. In turn, these video tutorials show the most frequent errors in English writing for the levels A2 to B1 according to the Common European Framework of Reference for Languages (Council of Europe 2001).

Image 2 illustrates an example of the use of Grammarly and suggests that the use of the adverb "really" should be removed and the plural form of the noun "sister" should be corrected. It also gives information about the overall score associated with the quality of the written composition (that is, 70 out of 100), as well as the degree of accuracy with respect to several categories such as correction, clarity and fluency.

Image 2. Use of Grammarly
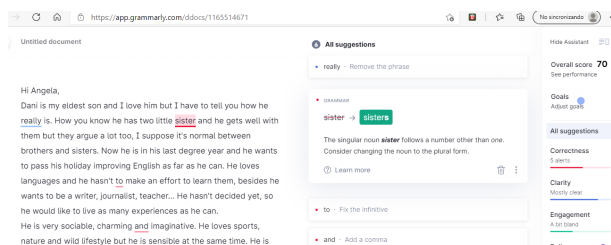
Conclusion

This blog of online and open access grammar checkers for the self-correction of English written texts is expected to have a significant impact on the learning performance of English learners. Also, we predict that the use of these tools can increase the motivation towards learning English, in general, and writing high quality texts in this language, in particular. Therefore, this repository will boost the acquisition of self-learning skills, and in turn, the development of creative writing. Likewise, the applicability of this repository is varied since it can support students that are enrolled in any speciality such as science, health, social science, law, humanities and technical fields. It will also facilitate the learning and teaching

process and the tutorial action in self-correcting English written texts, a task that can be carried out by students and teachers equally, regardless of the educational stage (namely, secondary education, A levels and tertiary education). The blog includes a satisfaction survey that will be used as an instrument of data collection so as to shed light on the effectiveness (or lack thereof) of the blog as a repository of tools that detect and self-correct English written texts.

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Creating open collections to support personal and professional development in emerging professions

Andy Lane[1]

[1] The Open University, United Kingdom

Innovative impact

The Systems Thinking in Practice Hub on OpenLearn brings together a wide range of open educational resources developed over many years by a group of academic systems thinking practitioners at The Open University in the United Kingdom. This collection of resources provides insights in to how systems thinking has been used in many teaching, research and development projects and how individual practitioners have used systems thinking in their work. In the short term these resources will be instructive to anyone wishing to use systems thinking in practice. In the longer term, as systems thinking practitioners are increasingly recognised as professionals through job titles, role standards and professional bodies, the ever growing set of resources curated on the Systems Thinking in Practice Hub will help underpin relevant qualifications and training programmes that support this nascent professional area.

Keywords: open educational resources, personal development, professional development, systems thinking

Introduction

Many first and second cycle degrees lead on to professional careers where a professional body or similar can offer continuing professional development to help them remain a functioning and respected practitioner in a particular field of work such as Engineering and Medicine. However, new professional areas constantly emerge as economies develop, such as Computing in the 1960s and 70s and Environmental Management in the 1980s and 1990s. While systems thinking has a century old history as an academic subject it is only just beginning to be recognised as a profession with the arrival of the systems thinking practitioner apprenticeship standard in the UK. This paper explains the contribution of The Open University to this new standard, including a new PG Diploma in Systems Thinking in Practice (Professional) and a Systems Thinking in Practice Hub on OpenLearn that collates open educational resources that can support the personal and professional development of such practitioners.

The opportunity

An emerging profession

Communities of practice that contribute to significant aspects of modern economies and societies often develop into communities of professionals that either recognise and regulate their members activities by setting and maintaining standards of behaviour or increasingly are also subject to statutory recognition, obligations and expectations. Part of the function of these standards is to set out both the level of relevant educational attainment and relevant professional experience needed to be recognised as competent in that profession. In some sectors of the economy and society more than one professional body may emerge, such as with Engineering or the Environmental Management, requiring different levels of education and experience to fulfil different levels of recognition as a competent professional. Where first and second cycle degrees are the required educational background, then higher education institutions often have to align some of their qualifications to meet these particular requirements [1].

The Degree Level Apprenticeship Standard

The Applied Systems Thinking in Practice Group at The Open University has been teaching, researching and developing how systems thinking relates to, can be embedded in, and might be defined through competences and capabilities within various workplaces [2]. One part of this work has been to encourage the development of an occupational standard for a systems thinking practitioner within the UK through the Institute for Apprenticeships and Technical Education. This standard was proposed by a

trailblazer group, a group of employers recognised by the Institute and reflective of those who employ people in the occupation, including small employers. The standard they proposed and had accepted can be fulfilled through a second cycle qualification that encompasses work based learning as well as more traditional taught modules. The thrust of this newly established role is to 'Support decision-makers in strategic and leadership roles to understand and address complex and sometimes even 'wicked' problems through provision of expert systemic analysis, advice and facilitation'.

The Systems Thinking in Practice Hub on OpenLearn

The idea of creating an open course at The Open University to bring together open resources has been previously reported [3]. This was before the approval of the Systems Thinking Practitioner occupational standard and associated qualifications that require work based learning. Being able to apply systems concepts and to reflect upon systems thinking used in actual work settings requires different ways of teaching and learning, including using open educational resources for self study. More specifically these resources need to be able to exemplify, support and demonstrate how systems practitioners have experienced the use of system concepts in different settings. In other words the resources have to cultivate the competences and capabilities that are embedded in the occupational standard.

The approach taken this time was not to create a course but to curate existing, and continue to add new, resources to a Hub on The Open University's OpenLearn platform. This Systems Thinking Hub is a collection of free resources - articles, videos, audios, and courses - that explore systems thinking in practice. The resources fall into five main groups:

1. Resources that deal with key ideas and concepts used in systems thinking in practice

2. Resources that show the application of systems thinking to complex environmental situations

3. Resources that show the application of systems thinking to other complex situations

4. Resources that explain how to draw and use systems diagrams to support your system practice

5. Resources that showcase the thoughts of key systems thinkers

The last group is particularly important as these showcase how people have used systems thinking in a diverse set of workplaces and activities which have featured complex or wicked problems. And they are of value to apprentices who will be taking up the new Systems Thinking Practitioner Apprenticeship from The Open University and in particular the work based learning module on 'Evidencing systems thinking in practice'. This module provides the framework for apprentices to gather, collate and present a portfolio of evidence that meets the awarding of the Apprenticeship standard and which equates to one quarter of the Post

Graduate Diploma in Systems Thinking in Practice (Professional) that they also gain from their studies with The Open University. This module also provides the stimulating link between academic study and practice, often involving apprentices critically reflecting on their learning and working practices, and so learning what existing partitioners do or have done will be helpful to this process.

As an emergent profession it will be necessary to add resources to the Systems Thinking Hub as cohorts of Apprentices experience and gain the qualification and recognition as a Systems Thinking Practitioner. But it also provides a valuable resource for other professionals who wish to improve their use of systems thinking in practice even if they do not intend to specifically become a named systems thinking practitioner. Indeed, systems thinking is an approach that complements scientific thinking by addressing multiple perspectives, examining boundary judgements and modelling interconnections. It is increasingly recognised as being an important skill. For example UNESCO includes systems thinking as one of the key competences for educators in education for sustainable development, while the Organisation for Economic Co-operation and Development (OECD) recently published a book on Systemic Thinking for Policy Making: The Potential of Systems Analysis for Addressing Global Policy Challenges in the 21st Century.

Conclusion

All professional workers evolve in what they value and believe defines their work, both individually and collectively. New, emerging professions have to do more to chart out the standards and expectations of a professional worker in their particular field. Educational resources of all kinds can play their part in supporting this evolution. The Open University has a wealth of such self-study educational resources which it is curating and adding to a Hub on its multi-award winning OpenLearn platform.

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A Collaborative Virtual Environment to train teachers in managing students' challenging behaviours

Dimakos Ioannis[1], Alexandridis Fanis[2], Assante Dario[3], Doeller Mario[4], Gerth Sabrina[5], Kourea Lefki[6], Madritsch Reinhold[5], Papastamatiou Nikos[7], Skaloumbakas Christos[7], Steinbacher Hans-Peter[4]

[1] University of Patras
[2] Theofanis Alexandridis Kai Sia
[3] Universita Telematica Internazionale Uninettuno
[4] FachHochschule Kufstein Tirol Bildungs
[5] Pädagogische Hochschule Tirol
[6] University of Nicosia
[7] Habilis Monoprosopi Ike

Innovative impact

Teachers' training and re-training is a recurrent central aspect in National and European policies in education, in orde to keep high their level of preparednees and effectiveness. Dealing with challenging student behavior is recognized as one of the main sources of stress for teachers, causing the experience burnout, and in the younger ones possibly leave the profession. Therefore, the training of teachers in classes with students who exhibit challenging behaviors is a particularly important aspect, but also very difficult to achieve. The VIRTUOUS project intends to make use of the most modern Collaborative Virtual Environments and Virtual Reality tools, to develop an innovative training course for teachers in this condition. The immersive experience places the teacher in a very realistic scenario and leads him/her to make decisions and adopt behaviors as if he/she were in a real class. The use of virtual reality headsets increases the degree of involvement of teachers. The project is not only innovative as teacher training tools in the specific context, but more generally as a model for using virtual collaborative environments as a training methodology.

Keywords: collaborative virtual environment, virtual reality, teachers' education, Erasmus+

Introduction

Teacher training is a fundamental aspect to have a teaching class with up-to-date skills and competences, and consequently more effective, conscious and productive in the workplace. A well-trained teacher is able to face the changes and training needs that society presents, face the challenges of inclusion and integration, use modern psycho-pedagogical models and activate initiatives aimed at comparison. It is no coincidence that national and European school policies always pay particular attention to initial and continuing teacher training.

In teacher training programs, there are some complex aspects that are often the least studied. The management of students' challenging behaviors is one of these. Pre-service (prospective) teachers while attending university are informed about behavior disorders and strategies to deal with them. It is only probable, however, that while placed at a practicum, pre-service teachers do not come into contact with behaviors that we would consider challenging. The supervision provided by a professional teacher during teaching practice takes away from the novice the authenticity of the teaching experience and short but eliminates the chance of having to deal with problems of student conduct.

Student disruptive and challenging behaviors are prevalent and create difficulties in classrooms on a daily basis. When

classroom disruption occurs systematically, then student learning and classroom instruction are hindered. Student problem behaviors may also produce negative school climate and lower student academic achievement. Teaching in classes with students with problem behaviors is a source of stress for teachers, causing the experience burnout, and in the younger ones possibly leave the profession.

Therefore, in the training programs it is necessary to include the management of students' challenging behaviors, while paying attention to the teaching methodology used. In fact, a traditional type of training, whether in the classroom or on texts, could be very simplistic, as it does not allow the teacher to appreciate the level of difficulty and stress in which he/she will find in reality.

The VIRTUOUS project

In such a context, the European Commission has funded the project VIRTUOUS [Using Collaborative Virtual Environments (CVE) to train teachers how to manage challenging student behaviour] in the framework of the Erasmus+ Programme. It is coordinated by the University of Patras (Greece) and involves partners from four countries: University of Nicosia (Cyprus), the Pädagogische Hochschule Tirol and the FHS Kufstein Tirol Bildungs GMBH (Austria), the International Telematic University Uninettuno (Italy), and Habilis Monoprosopi IKE and Theofanis Alexandridis kai SIA EE (Greece). It aims to develop a training program and a collaborative virtual environment to train teachers and student teachers in managing students' challenging behaviors. It mainly addresses primarily school teachers, but can be used also for other levels of teaching with few or no changes.

The teaching methodology
The VIRTUOUS project are comprised of three key elements:
   • a training curriculum,
   • a virtual learning environment and
   • a training course for teachers and student teachers.
The curriculum is structured in six modules, each referring to the Learning Outcomes that the teacher should acquire. The modules are organized in scenarios, which refer to different management methods that the teacher can adopt, such as the use of verbal language but also body language (e.g. eye gaze, proximity control) or managing strategies (e.g. Ignore-Praise -Attend strategy).

Each scenario is designed for active learning. That is, the context and how to use the management technique are not simply described, but rather the scenario is proposed in the form of a narrative, in which the teacher operates in an apparently real context, has to make decisions and can finally learn the consequences. of their choices. The possible choices are not only totally right or wrong, but there are slightly better or worse choices, to make choosing more difficult. So it is a learning-by-doing training, even if a simulated context.

The scenarios are then implemented in the collaborative virtual environment, which is a specific feature of the project. In fact, in the reality of the classroom there are a whole series of factors that influence the choices of teachers, which of course do not emerge when the scenarios are simply described in a document. Therefore, to recreate the context of the classroom, a virtual environment was designed, where the teacher avatar can interact with the students' avatars. The use of virtual reality headsets allows the teacher to have the visual sensation of actually being in a class. The use of an advanced graphic engine, which allows to implement even the slightest reactions of the body, such as different looks or facial expressions, allows the teacher to have a realistic and accurate perception. Furthermore, it allows to accurately implement all those scenarios where the role of non-verbal language in class control is intended to be stressed.

The combination of an active learning methodology and a CVE for learning represent an innovative and more effective strategy for training teachers to manage challenging student behaviors. It should also be appreciated that the didactic mode chosen can be successfully used for both classroom and remote training, both in synchronous and asynchronous mode, however achieving high effectiveness thanks to the active participation of teachers. Therefore it is a flexible model that lends itself to different applications.

The project will end in 2022 with a pilot that will involve teachers from all the countries of the partnership. On this occasion, both the training course and the CVE will be tested and validated by real teachers.

Considerations and perspective developments

The VIRTUOUS project intends to develop a training course for teachers in managing students' challenging behaviours. The innovative aspect of the project is the use of CVEs, which allow the development of an active training model, in which the teacher is in a certain scenario and must take appropriate actions or attitudes. Giving teachers the opportunity to deal with challenging behaviours in a controlled environment with the appropriate supervision would improve their level of professional preparedness or effectiveness (if already professionals) and decrease their chances of developing burnout and eventually dropping out of the profession. Therefore, it is already in itself a step forward compared to passive learning models, based on written or oral communication.

The project therefore intends to develop a new paradigm for training teachers by creating an environment with ample opportunities for trainees to develop, or hone behaviour management skills. It aspire to further develop this paradigm so as to encompass all teaching subjects and eventually offer a convincing case to universities or schools of pedagogy to adopt our paradigm as the least threatening, full of training

opportunities, inexpensive and effective way of imparting new skills to prospective teachers.

Furthermore, it also wants to be a study on the use of CVEs in education, with the prospect of using them in the near future in different contexts. This is also likely in perspective, considering the continuous development of virtual reality technologies and their ever-increasing use in the near future.

Finally, even if it is not specifically envisaged by the project, the developed model can also be used in general for statistical behavioural studies. For example, by repeating the scenarios by changing some characteristics of the students (e.g. sex, age, ethnicity, religion, eventual disability, etc.) it is possible to analyse if and to what extent these characteristics influence decisions. This is another added value of the developed model, enabled by the flexibility of the virtual environment.

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04 Online Assessment

Adaptation of the final exam in a distance education course: from face-to-face to online assessment

Inés Gil-Jaurena[1] and Daniel Domínguez[1]

[1] Universidad Nacional de Educación a Distancia (UNED). CO-Lab teaching innovation group.

Innovative impact

In May 2020, due to the COVID-19 pandemic, the UNED changed the final assessment system from face-to-face exams in the regional centres to online exams. This system was maintained during 2021. We report on the adaptations we introduced in the final exam in both academic years in a distance education course titled *Community Development* in the Faculty of Education, with 600-850 students. An analysis of the students' academic performance shows a great increase in the assessment rate (number of students who take the final exam) when the exam changed to online mode. During the first year when the online exam was used, 2020, the achievement and succes rates and the average mark also increased, while they decreased in 2021, the second academic year when e-assessment was used. These rates were still higher than before the pandemic. The number of registered students in the course in 2021 was higher than in previous years, following the successful achievements in 2020. The students' perception of online exams is generally positive, and the preference for this e-assessment method over face-to-face exams increased with practice, going from 54.4% after the first year to 87.5% in the second year. While in 2022 the UNED has returned to the traditional face-to-face exams, the experience has led us to redesign the exam and the overall assessment process to improve its alignment with learning outcomes.

Keywords: online assessment, exam, distance education, e-assessment

Introduction

In May 2020, due to the COVID-19 pandemic, the *Universidad Nacional de Educación a Distancia* (UNED) changed the final assessment system from face-to-face exams in the regional centres to online exams, using an e-assessment software designed by the university called AvEx (https://blogs.uned.es/avex/). The online exam system was maintained during 2021, as well.

As a distance education university, the main change experimented during the pandemic was related to the final assessment, as the delivery of the courses was already online. Thus, the report is focused on the description and analysis of the impact experienced in a specific course, titled *Animación Sociocultural* (*Community Development*), that the authors teach in the Bachelor's Degree in Social Education, when we adapted the on site exam to an online exam in years 2019-2020 and 2020-2021. It is a compulsory course taught in the second semester of the second year of the Bachelor's Degree.

Adaptations in the final exam during the pandemic

The unexpected pandemic challenged us to adapt the final assessment method in the *Community development* course so we could guarantee students' right to get assessed at the end of the academic year. This was a challenge we tried to address in the framework of our previous efforts to design a more coherent and authentic assessment (Gil-Jaurena et al., 2022) [1], and the new situation gave us the opportunity to further experiment with a fully online assessment system. In table 1 we present the characteristics of the final exam in years 2019 (pre-pandemic), 2020 (first online experience during the pandemic) and 2021 (second year of online assessment). We have explored to different e-assessment modalities: asynchronous 2-day exam in the course LMS in 2020, and proctored online synchronous 90 minutes exam in AvEx in 2021. We could have used AvEx in 2020, as well, but in that first year when lockdown was generalized, we opted for a more flexible e-assessment asynchronous system that we considered would be less stressful for our students.

Table 1. Adaptation of the final exam in the course

	2019	2020	2021
Final assessment system	On site, face-to-face in regional centres	Online in the course LMS (aLF)	Online en AvEx, specific e-asessment software
Exam type	Synchronous mixed exam: 10 MCQ and 4 open-ended questions	Asynchronous mixed exam: 10 MCQ and 4 open-ended questions related to a long case	Synchronous mixed exam: 10 MCQ and 4 open-ended questions related to short cases
Time to complete	120 minutes	MCQ: 30 minutes along 1 day Case: 2 days	90 minutes
Resources allowed	None	Open book exam	Open book exam
Integrity guarantee	Student identification in the exam room, invigilation, no devices allowed	Student identification in the LMS	Student identification in AvEx, camera shots during the exam, no copy and paste allowed, reduced time, antiplagiarism software

During the pandemic, we moved to open book online exams.

We kept the multiple choice questions (MCQ) section of the exam to evaluate the mastery of fundamental concepts and specific vocabulary; but we moved to an online test that in 2020 could be filled by the students during 30 minutes starting at any time during one day, and in 2021 the test was included in the 90-minutes synchronous exam.

In the online exam modalities we also kept the open-ended questions section, but we redesigned them so they were related to cases that needed a comprehensive and integrated reply, instead of indepedent open-ended questions we used before the pandemic. In 2020, the asynchronous exam included a 2-pages case and 4 open-ended questions related to it. The students could download the exam one specific day (when also the MCQ test was available) and submit an archive with their reply until the end of the next day. In 2021, the exam in AvEx included 4 open-ended questions related to short cases that were explained in 3-4 sentences before each

question. The students had to use contents from different themes of the syllabus and justify their replies.

Impact of the online exam experience

Impact on students' performance

Data provided by the UNED Data Management Office show that figures have changes in the three academic years (table 2).

Table 2. Academic rates in the course

	2019	2020	2021
Number of students	645	607	853
Assessment rate	64.81%	82.37%	82.3%
Success rate	87.56%	97.6%	92.74%
Achievement rate	56.74%	80.4%	76.32%
Average score	6.83	7.49	7.04

Notes:

Assessment rate: % of students who took the exam among those enrolled

Success rate: % of students who passed the exam among those assessed

Achievement rate: % of students who passed the exam among those enrolled

Average score: assesment mark mean (from 0 to 10) among those who passed the exam

An analysis of the students' academic performance shows a great increase in the assessment rate (number of students who took the final exam) when the exam changed to online mode. In 2020, the first year when the online exam was used, the ahievement and succes rates and the average mark also increased, while they decreased in 2021, the second academic year when online exams were used. These rates were still higher than before the pandemic. Another effect is that the number of registered students in the course in 2021 was higher than in previous years, following the succesful achievements in 2020.

Impact on students' perceptions about online assessment

We prepared and distributed an online survey to collect students' perceptions about the e-assessment experience. 180 students from the Social Education Degree replied to the survey in July 2020. A majority (54.4%) shown a preference for online exams instead of face-to-face ones. We highlight some quotations from that sample, referred to the experience in our course:

"I would like to congratulate the teachers of the *Community Development* course for the exam in alF [LMS]. I was very nervous about how it would be, but I consider that it has been a very complete exam that has allowed me to develop my knowledge and relate it to each other"

"I think asynchronous exams where we could use materials are the best form of assessment, allowing students to demonstrate their understanding of the subject rather than their memory capacity."

In July 2021, 849 students from the Social Education Degree replied to the survey, and 87.5% shown a preference for online exams. Main reasons refer to convenience (saving time, travel, money) and well-functioning of AvEx, in terms such as:

"The online exam allows a better reconciliation of work and family, by not having to travel to the Regional Center, saving a lot of time and money on travel"

"It has been a very good experience".

Conclusion

The change to online final exams has had a clear impact on encouraging students to take the exams, thus increasing the assessment rate. As teachers, we value this aspect positively and put the focus on the exam design so we can measure more accurately students' knowledge, comprehension and domain of the course contents and applications. While the asynchronous experience during course 2019-2020 was positive and well valued by the students, the integrity control was lower. Also, the process of marking the exams was less comfortable, as we had to download, open and mark each archive individually. On the other hand, the synchronous experience in AvEx during course 2020-2021 was positive in terms of integrity control, user experience and process of marking, as the software is prepared to facilitate teachers' access to each exam and score.

In academic year 2021-2022, the UNED has returned to face-to-face final exams in regional centres. As teachers, we can not continue with the online exam modality and have to adhere to the institutonal decision, and we don't have data yet to analyze the impact of this return to 'normality' on our students' performance and opinion. But we have learnt that, despite the assessment system (online-offline), we have to work on the design of the exam and of the assessment method as a whole to enhance alignment with learning outcomes and guarantee a rich and rigurous assessment, and continue moving towards conceiving assessment as learning and for learning.

Comparable examples

A broader study analysing the overall UNED experience is published in Domínguez et al. (2022) [2].

Hatzipanagos et al. (2020) have studied the transtition to online assessment during the pandemic at the University of London [3].

An EDEN NAP Webinar in May 5th 2021 reported about "Changing Assessment Due to Covid-19: Experiences and Impact", including the UNED and University of London cases [4].

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Challenges of e-examinations

Teija Lehto and Sanna Sintonen

Tampere University of Applied Sciences

Innovative impact

Technically supervised e-examinations have a great potential to make studying more flexible in higher education. EXAM is a modern e-examination software developed and used by a consortium of 28 universities and universities of applied sciences in Finland. EXAM is a tool for technical supervision of exams in controlled spaces. The short-term impact of this article includes reflection on how many Finnish universities missed their opportunity for flexible e-examinations during the Covid-19 pandemic. The long-term innovative impact covers the reflection of how the situation can be improved, when we face the same kind of challenges in the future. The authors discuss the theme from the point of view of Tampere University of Applied Sciences (TAMK).

Keywords: e-examinations, evaluation, covid-19, pandemic

EXAM – software and a national higher education consortium in Finland

EXAM is modern software developed and used by a consortium of 28 Finnish Universities and Universities of Applied Sciences. In Finland CSC – IT Center for Science, has a key role in the maintenance and further development of the software. The primary purpose of the EXAM system is to provide an option for flexible e-examinations in technically supervised facilities located in the premises of the universities. Institutions can maintain their own local installations of EXAM or hire the service from CSC as SaaS (software as a service). [1].

EXAM – digitalization of examination

The EXAM system offers students freedom and flexibility to take exams – even to the extent that it has been called a 'self-service exam'. The types of questions EXAM software includes are essay questions, automatically checked multiple choice questions, fill-in-the-blanks questions, true/false statement questions, and any combination of these. The teacher prepares the exam in advance, designing the questions and setting a certain completion period (for example, two weeks) for the student.

When a student reserves a time slot in the EXAM calendar, the system makes a random draw for a suitable computer located in a suitable exam room on behalf of the student. In the next phase the student takes the exam. In some universities these exams are called 'aquarium exams', as they are often taken in a technically controlled space surrounded by transparent walls. EXAM rooms are equipped with recording cameras, automated surveillance and access control, and they are available for students from morning to late evening. [4].

The three Exam rooms at Tampere University of Applied Sciences have each about 20 computer workstations with a limited selection of software. The computer is only connected to the EXAM system, having no access to the internet. For demonstrating their competence in the exam, the students can use the basic applications installed on the computers, such as MS Office, and they can make CAD drawings or images.

Impact of flexible exams on the well-being of students

Electronic examinations have an impact on the well-being of students, as they can adapt the exams to their own, individual pace of life. The flexible exam practice also makes it possible for many students to work alongside their studies. The flexibility of scheduling associated with booking your own exams gives a sense of control over your own studies [5].

According to Rytkönen and Myyry [5], when students took exams in designated facilities at a time of their choice, they prepared for the exams in the same way as for traditional examinations written on paper. However, subsequent student surveys have provided indications that students feel more prepared for the exam when they are free to book their own exam time.

According to a study by Cordis and Pierce [2], timing of the exams is inextricably related to grades: exams performed at earlier hours of the day often yield lower grades. When more freedom is given to the students of the Finnish universities of applied sciences to choose the date and time of their exams, they tend to prefer the end of the week and the afternoon hours [3].

Pandemic procedures in the EXAM facilities

In March 2020 the COVID-19 situation challenged the traditional onsite examination sessions on the university campuses in Finland. Unfortunately, when the flexible e-exam arrangements were most urgently needed, only about half of the EXAM seats and computers were in use and functioning: to keep safe distances between the students, it was necessary to block out every second of the workstations in the EXAM rooms.

Within these limitations, exams and verification of competences could also be implemented during the most acute pandemic times. According to our observations, the students wore masks quite conscientiously, and they also quite willingly disinfected their hands, the computer keyboards and mouses in the EXAM facilities.

Challenging the teachers

The digital EXAM system challenges the traditional way of thinking, where a group of students takes the same exam at the same time in one space. For teachers it means that exam questions need to be carefully designed in advance. The applicability and reusability of the questions in the EXAM question bank rises to an important role. Therefore, the EXAM system supports random drawing of questions from a large question database.

Not all teachers are experienced enough with the EXAM yet. Some teachers have tendency to limit the student's exam period to a couple of days only. This does not give enough flexibility to the student, and more importantly – the EXAM calendar may be fully booked for those days. Various competency verification tests and final examinations are running in the EXAM facilities on a regular basis.

EXAM Visit

The EXAM system enables supervised competence verification throughout Finland. **Exam visit** means that students can take their exams in the supervised facilities of another university. As the same EXAM system is used in most of the universities in Finland, students can fairly freely and flexibly choose the most convenient location to take an exam within the range from Helsinki to Lapland. The EXAM offers our students both time-related and geographical flexibility. [1].

In the COVID-19 pandemic situation in the middle of March 2020, distance learning was introduced in the universities around Finland. At the same time the electronic examination facilities were closed urgently in most universities. Gradually, the EXAM facilities started partially reopening to students in May 2020. Unfortunately, at this stage the pandemic health security policies of a large number of universities did not allow outsiders to enter the university facilities. These policies practically stopped the exam visits, when they were most acutely needed. Although this very unfortunate, judging harshly decisions made in the midst of an acute pandemic would not be constructive. It is evident that both public health authorities and decision makers inside universities were balancing between the health-based regulations and the efforts to support students with their studies.

Conclusion

Technically monitored e-examinations have a great potential to serve students in higher education. Unfortunately, this potential was to some extent missed during the Covid-19 pandemic, when several universities in Finland reduced access to their e-exam spaces and interrupted their exam visits due to pandemic restrictions.

Taking a retrospective view, the authors of this article hesitate if the decisions made were the most successful ones. Allowing exam visits during the lockdowns could have significantly reduced the students' travelling from one city to another inside the country. The students should have been able to take their exams in a location nearest to where they were residing during the pandemic. While protecting our university facilities we did not necessarily protect our society as a whole. We did not see the forest from the trees.

Comparable examples

EXAM – electronic exam software for higher education. https://e-exam.fi/in-english/

Electronic exams at Tampere University of Applied Sciences. https://sites.tuni.fi/tamk-exam-en/

EXAM service of Tampere Universities community https://sites.tuni.fi/exam-en/

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Peer assessment in online learning: Promoting self-regulation strategies through the use of chatbots in Higher Education

Nati Cabrera[1], Maite Fernández-Ferrer[2], Marcelo Maina[3], Lourdes Guàrdia[4]

[1,2,3,4] Universitat Oberta de Catalunya

Innovative impact

There are many studies and practices that aim to improve assessment and feedback using technology. However, there is hardly any research on the use of technology to support and guide metacognition in self-regulation during the learning and assessment process in online learning.

We present an innovation project supported by the research framework in the Master's in Education and ICT at the Open University of Catalonia (UOC) that scaffolds self-regulation using chatbots and focuses on peer assessment by means of essay writing. This activity develops student reflection and critical thinking while promoting self-regulatory capacity through peer assessment practice.

The chatbot is used to support the development of students' self-regulation competence, while they carry out a learning activity involving peer assessment. The activity consists of writing an essay reflecting on the functions and role of techno-pedagogical designers today and on future trends. This must be based on the theoretical framework applied in the subject.

The online peer assessment process allows students to adopt the role of evaluator of a draft essay presented by others. They must critically analyse the work, apply criterion-based assessment, and provide constructive feedback. The assessment criteria they are expected to use is a simplified version of the assessment rubric applied by the teacher after the final submission of the essay. This process focuses on giving formative e-feedback, but also on meaningfully interpreting and integrating peer feedback to improve the essay. As students are not used to exercising an active role in the learning and assessment process, nor one aimed at developing self-regulation competence, the chatbot provides guidelines during this process as another important learning goal.

Keywords: self-regulation, peer assessment, chatbot, online learning

Introduction

The research project presented below takes place in the Faculty of Psychology and Education of the Open University of Catalonia (UOC), specifically, in the online master's degree in Education and ICT (Information and Communication Technology). The experience is developed in the course 'Fundamentals of e-learning techno-pedagogical design', which aims to train professionals in the educational field so that they are capable of designing learning experiences for technology-mediated learning environments.

The specific learning activity in which this innovation has been implemented, proposed to students at the end of the semester, bases its methodology on an academic essay writing exercise. This methodology (Klimova, 2012; Dysthe, 2015) has been applied to encourage students to order their thinking through a creative writing process, requiring the cognitive effort of describing their ideas, defending these ideas from the sources consulted throughout the subject, and substantiating them appropriately and adequately. **This activity aims to promote student reflection and critical thinking and**

develop their self-regulatory capacity through online peer assessment practice.

Description of the experience

The subject and activity covered by this experience have been designed following the UOC's online educational model and are offered on its virtual campus. In addition, some methodological and technological specificities have been added that enrich and improve the students' learning experience with closer teacher support: the use of Moodle (and specifically a workshop tool) for the peer assessment process, and the integration of an ad hoc chatbot (Garcia Fuertes & Molas, 2018) to accompany the students' learning and self-regulation process (Pintrich, 2000; Zimmerman, 2000).

If to this writing process we also add intermediate peer review actions that give students feedback (Nicol & Macfarlane-Dick, 2006; Carless & Winstone, 2020) from their colleagues on work that is not yet finished, the learning process can be a real success. In fact, this feedback provided by peers can serve as a suggestion to improve the text or even become the perfect excuse:

- To reflect on what is written,
- To make better progress in developing the academic text,
- To ensure that their work is not done quickly at the end,
- And even, to keep students more motivated.

And, in practice, how is this learning activity carried out?

The online learning activity consists of several steps which are detailed below (Figure 1), taking into account that self-regulation is transversally supported by the use of a chatbot:
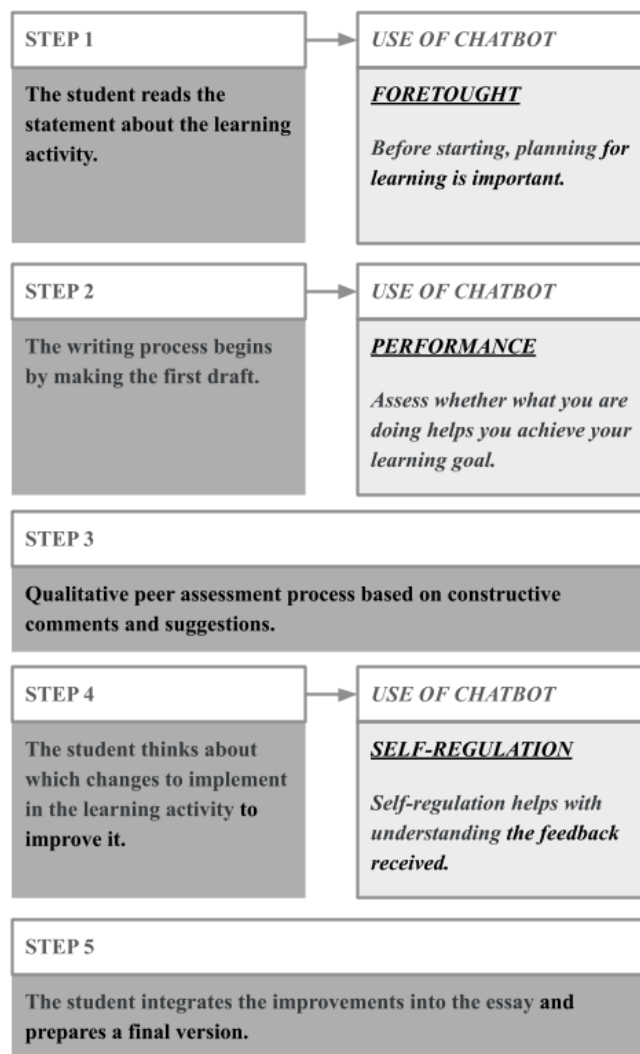

Figure 1. Learning activity sequence.

FIRST STEP. *Let's start!* Once students have read the statement about the learning activity, they begin to become familiar with the preparation of the essay. For this, they have at their disposal resources and a discussion forum for any consultation with the teaching staff or the other students.

SECOND STEP. *When the writing begins!* The writing process begins by making the first draft with the different sections of the essay. Students are advised to consult the rubric that teachers will use for their assessments. This allows them to self-regulate and assess all the aspects that must be taken into account and those that can be improved.

THIRD STEP. *What does my peer have to say?* The peer-review process begins with the student sending the first draft of their essay for assessment by a peer while, at the same time, they assume the role of evaluator and must critically assess the work of another peer. This peer assessment process is qualitative and based on making constructive comments and suggestions for improvement.

FOURTH STEP. *Making sense of the feedback received!* Once students have received and reviewed the qualitative feedback received, they complete a form answering two questions about the quality of this feedback and explain in writing what specific improvements they plan to make to their essay in response to the suggestions that have been provided.

FIFTH STEP. *END OF THE MATCH!* To conclude the experience, the student integrates the improvements into the essay and prepares a final version that is delivered through the virtual classroom so that this time it is the teacher who assesses it. For this, the teacher not only evaluates the final version of the learning activity but also the assessment that the student has made of their peers.

The chatbot was created through a collaborative co-design process with the students and teachers involved in the experience and was specially designed to accompany the development of learning self-regulation skills, based on Zimmerman's theory (2000). To guide students' self-regulation processes, a type of structured interaction is proposed through this chatbot based on contextualized questions according to the self-regulation phases and the development of the learning activity. In the dialogue between the chatbot and the student, infographics are presented as a textual and visual interaction. Although the chatbot is always available in the virtual classroom, its use is encouraged by the teacher at some specific moments considered the most appropriate for students to develop their self-regulation, which are:

1. *Forethought:* definition of objectives, time dedicated, etcetera.
2. *Performance:* contrast progress with planning and expected results at each stage of the process.
3. *Self-reflection:* personal and well-founded self-assessment of the process as a whole in relation to metacognition and the capacity for self-regulation.

Conclusions

Putting this type of experience into practice makes it possible to activate critical thinking skills and self-regulation in an educational context mediated by digital technologies. Specifically, critical thinking is not only developed through writing the essay but also through peer assessment practice. In this sense, the fact that the student assumes an assessor role also has clear advantages for their learning since it forces them to appropriate the assessment criteria for the activity, that is, to fully internalise them and clearly understand their meaning.

This experience not only offers students the possibility of improving their learning process but also of developing their self-regulation competence through chatbot support.

All of this affects the quality of student learning since it improves their understanding and assimilation of the subject contents, as well as their ability to assess them in the work of others by providing formative feedback (which requires the identification of opportunities for improvement). **Therefore, this is an experience that clearly fosters self-reflection and self-regulation of learning.**

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