ADOPTING GAMIFICATION AS A STRATEGY TO SUPPORT STUDENTS' MOTIVATION IN HIGHER EDUCATION:

THE TEACHERS' ROLE

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ABSTRACT

Students' academic performance and learning outcomes are significantly influenced by their level of engagement in learning activities and their motivation to learn. Several studies referred to gamification as a possible strategy to foster students' engagement and motivation at the Higher Education (HE) level. However, a crucial factor affecting the adoption and the success of this new pedagogical practice is the fact that teachers possess the needed skills' set to implement it. To equip teachers with the competences needed to effectively design, implement, and evaluate a gamified learning activity, an online course was prepared and piloted in the framework of the European project ECOLHE. This work will offer an analysis of the course design process and a synthesis of the course implementation results.

Keywords: Gamification, Higher Education, students' engagement, teachers' training, teachers' attitude

INTRODUCTION

Engagement and motivation are vital factors in higher education, as they directly influence students' academic performance and overall learning outcomes (Davis & McPartland, 2012; Finn & Zimmer, 2012; Liu, Bridgeman, & Adler, 2012; Trowler, 2010). Actively engaged and motivated students are more likely to participate in class, complete assignments on time, collaborate with peers, and seek a deeper understanding of the subject matter. Such students tend to exhibit higher levels of critical thinking, creativity, and problem-solving skills, fostering an enriching educational environment (Fredricks, Blumenfeld, & Paris, 2007; Trowler, 2010).

Despite recognizing the significance of student engagement and motivation, HEIs often encounter challenges in effectively achieving and maintaining desired levels (Kahu, 2013; Thomas, 2012; Trowler, 2010). Factors such as passive teaching methodologies, disconnection between theoretical concepts and real-world applications, and limited personalisation of learning experiences contribute to decreased students' engagement and motivation (Schnitzler, Holzberger, & Seidel, 2020). Recognizing these struggles, HEIs are actively seeking innovative approaches to enhance students' learning experience.

Gamification presents a promising solution to address the challenge of student engagement and motivation. By incorporating game elements, such as challenges, rewards, and progress tracking, into the learning process, gamification transforms the educational experience into an interactive and immersive journey. Numerous studies have reported positive outcomes of educational gamification, including increased student engagement, motivation, knowledge retention, and overall satisfaction with the learning process (Kovácsné Pusztai, 2021; Metwally, Nacke, Chang, Wang, & Yousef, 2021; Subhash & Cudney, 2018; Wu, Zhou, & Li, 2023).

Even in the light of its potential benefits, the adoption of gamification in higher education faces certain barriers. One significant obstacle is teachers' attitudes and knowledge about gamification. Some educators may be hesitant to implement gamified approaches due to unfamiliarity, concerns about time constraints, or doubts about its effectiveness. Moreover, limited exposure to gamification during their own education may contribute to teachers' reservations and lack of confidence in employing such strategies. Therefore, to enhance teachers' attitudes and knowledge about gamification, several steps can be taken. First and foremost, professional development programs and workshops can be conducted to introduce teachers to gamified learning approaches, provide hands-on experience, and showcase successful case studies (Lester et al., 2023; Sajinčič, Sandak, & Istenič, 2022; Santos-Villalba, Olivencia, Navas-Parejo, & Benítez-Márquez, 2020; Toda, Valle, & Isotani, 2018; Wu et al., 2023).

With the aim of contributing to the advancement of higher education teachers' knowledge and skills in gamification, six European universities (Laurea, Finland; LCU, Italy; UCC, Ireland; Roma Tre, Italy; UOC, Spain; UPatras, Greece), all partners of the Erasmus+ project ECOLHE, jointly designed, implemented and evaluated an online training program. The results of the pilot implementation of this program will be discussed in this paper.

LITERATURE REVIEW

Adoption and effectiveness of gamified learning in Higher Education

Gamified learning in higher education, also known as educational gamification, gamification in education, or gamification for educational purposes, has been the subject of various definitions and conceptualizations. Landers (2014) defines gamified learning as the use of game elements to facilitate learning and related outcomes, including action language, assessment, conflict/challenge, control, environment, game fiction, human interaction, immersion, and rules/goals. He emphasises that educational gamification must successfully modify learner behaviour or attitude toward learning. In contrast, serious games differ from gamification as they directly provide instructional content, while gamification supports existing instructional content. Dichev & Dicheva (2017) share a similar perspective, stating that gamification in education involves introducing game design elements and game-like experiences into learning processes. They highlight the transformational aspect of gamification, making the learning process more game-like. Other scholars, such as Tulloch (2014) and Songer & Miyata (2014), view educational gamification as a pedagogic framework that integrates entertainment, engagement, and playful experiences to enhance learners' intrinsic motivation.

Educational gamification has gained significant attention in research, especially in higher education. A literature review by Manzano-León et al. (2021) revealed a substantial increase in experimental articles on educational gamification between 2016 and 2019. This rise in interest can be attributed, in part, to the changing expectations and characteristics of the current generation of university students. Millennials and Generation Z, who form the majority of university students, are technologically adept and familiar with video games, making them receptive to gamified approaches. Research indicates that university students generally have a positive attitude towards gamification in education, as it makes lectures more interesting and improves the learning environment (Alabbasi, 2017; Cheong, Filippou, & Cheong, 2014).

Numerous empirical studies have explored the effectiveness of gamification in educational settings, particularly in terms of its impact on motivating and engaging learners (some of the most recent ones include: (Campillo-Ferrer, Miralles-Martínez, & Sánchez-Ibáñez, 2020; Huang et al., 2020; Kovácsné Pusztai, 2021; Tsay, Kofinas, & Luo, 2018; Wu et al., 2023)). Some studies have highlighted several positive effects of gamified learning in higher education, including improved student performance, increased engagement and motivation, better attitudes toward learning, overall enjoyment of the learning process, and even higher quality of work (Antonaci, Klemke, & Specht, 2019; Caporarello, Magni, & Pennarola, 2019; Dreimane, 2019; Zainuddin, Chu, Shujahat, & Perera, 2020).

On the other hand, negative effects of educational gamification should not be overlooked. Some studies have found that gamification may lead to loss of performance, undesired behaviour, and declining

effects on learners (Toda et al., 2018). The overjustification effect (Deci, Ryan, & Koestner, 1999) has also been observed, where the provision of extrinsic rewards diminishes intrinsic motivation to learn (Hanus & Fox, 2015). Moreover, it needs to be taken into account the fact that not all students respond in the same way to gamification, and individual differences such as learning styles, personality traits, and player types can influence the efficacy of gamified interventions (Buckley & Doyle, 2017; Domínguez et al., 2013).

Although it cannot explain all the negative effects reported in the literature, it can be pointed out that the poor design of the gamified intervention is often cited by scholars as the cause of negative or neutral results. Indeed, the simple integration of points, badges and rankings into a learning content or process, often referred to as PBL gamification or even 'pointification' of learning, is a frequent but superficial implementation of educational gamification, which is often reported as having no effect or even being detrimental (Domínguez et al., 2013).

However, due to the inherent multi-disciplinary nature of gamification, the design and implementation of a gamified learning intervention may require a wide range of knowledge and skills, ranging from psychology to education, from game design to interaction design, as well as, of course, specific knowledge related to the disciplinary field in which gamification is to be implemented. A wealth of knowledge and skills that a teacher does not necessarily possess, increasing the barriers and difficulties to experimenting with this approach.

Barriers to the adoption of gamified learning at the HE level

Currently, only a small fraction of university teachers incorporates gamification or game-based learning in their teaching. Various studies have identified the drivers and barriers influencing teachers' adoption of gamification. Teachers are motivated by expectations of increased student interactions, collaborative learning, higher engagement, enjoyment, and motivation (Lester et al., 2023; Sánchez-Mena & Martí-Parreño, 2017). Conversely, barriers include a lack of time to develop gamified approaches, insufficient evidence of benefits, challenges in managing classroom dynamics, and financial constraints (Sánchez-Mena & Martí-Parreño, 2017).

When asked to reflect on the most relevant advantages and disadvantages of gamified learning, HE teachers, researchers and doctoral students involved in the ECOLHE project (n=44) showed an overall positive attitude towards gamification, while still expressing several concerns about its effectiveness and possible risks of implementing it (Marinensi, Di Lallo, & Botte, 2023). They were given a list of predefined advantages and disadvantages of gamification in education and were asked to rate these factors on a five-point Likert scale. The results showed that participants generally agreed on the advantages of gamification (Figure 1), such as improving knowledge absorption and retention, fostering motivation and engagement, providing immediate feedback, applying learning in meaningful contexts, and promoting cooperation and teamwork.
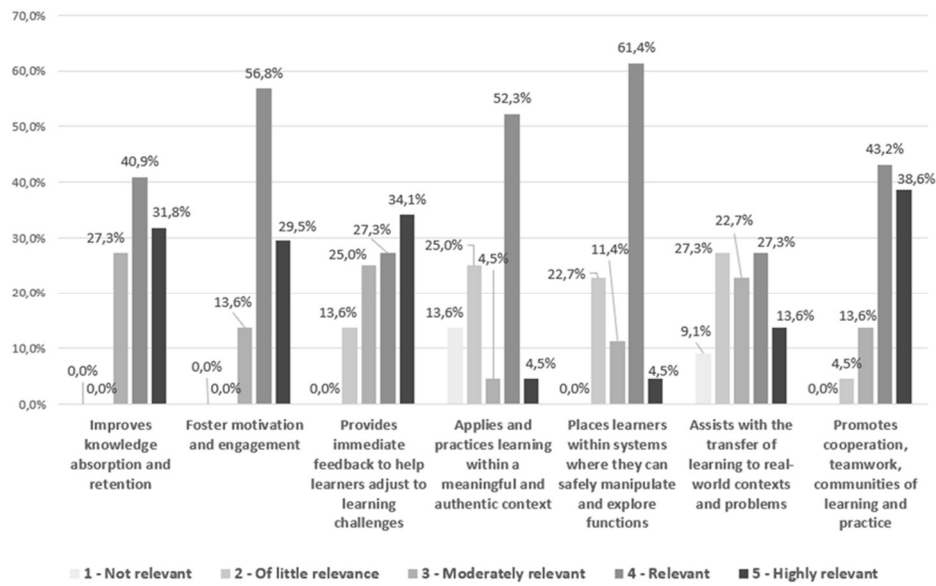
Figure 1. Advantages of gamification

However, there were varied opinions on some disadvantages (Fig. 2), such as distraction from learning objectives, overstimulation or game addiction, replacement of other learning activities, meeting the needs of all learners, blurring boundaries between virtuality and reality, and consuming teaching resources and time. Some participants also provided additional insights and concerns about gamification, including its impact on stress levels, the need for digital competencies, availability of IT equipment, and adapting to different student motivations.
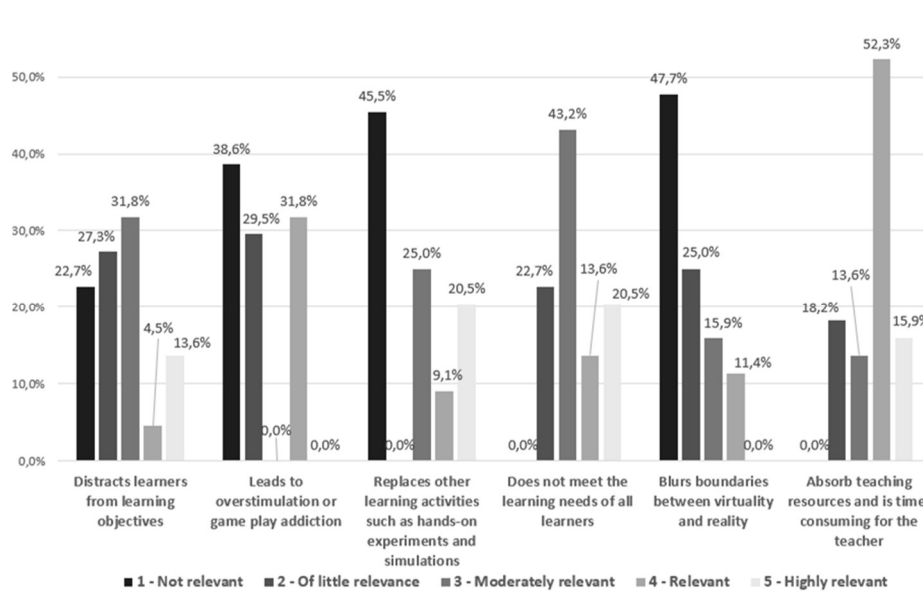

Figure 2. Disadvantages of gamification

The importance of teachers' training

Providing teachers with proper training, guidance, and support during the design and implementation stages of gamified learning interventions can bridge the existing gap between the overall teachers' attitude toward gamification and its actual use in their teaching practice (Santos-Villalba et al., 2020). In light of existing literature on this subject (Sajinčič et al., 2022; Santos-Villalba et al., 2020; Wu et al.,

2023), is possible to affirm that offering HE teachers' adequate training about gamification could also be a key factor affecting the effectiveness of gamification for several reasons:

- Creating the conditions for proper implementation: teachers who receive training in gamification are better equipped to understand the principles and strategies involved in effectively incorporating game elements into their teaching practices.
- Fostering pedagogical knowledge: training allows teachers to gain a deeper understanding of how gamification can be integrated into the curriculum and instructional design.
- Addressing challenges: gamification in education presents challenges that teachers need to be prepared for. Teachers who are aware of these challenges can make informed decisions and adjustments to optimise the effectiveness of gamification.
- Encouraging the adaptation to student needs: training empowers teachers to adapt gamification approaches to the diverse needs of their students. They can consider factors such as students' learning styles, preferences, and individual differences when designing gamified experiences.
- Fostering continuous improvement: training provides teachers with the knowledge and skills to evaluate the effectiveness of gamified interventions. Continuous professional development ensures that teachers stay up to date with new research and best practices in gamification, allowing them to continually enhance their instructional approaches.

Additionally, involving a group of teachers in training initiatives can build the basis for creating a community of educators with different degrees of experience in educational gamification, which can contribute by developing resources and sharing experiences to the adoption of appropriate gamified approaches.

THE ECOLHE PILOT TRAINING

Course design

One of its key outputs of the ECOLHE project, funded by the European Commission under the Erasmus+ framework, involved the development and implementation of a training program designed for teachers in order to enhance online teaching in higher education. This initiative aligns with the principles of lifelong learning, inclusivity, and innovation as emphasised by the High-Level Group on the Modernization of Higher Education (European Commission, 2013).

To evaluate the efficacy of the training program, a pilot phase was incorporated, testing also the digital platform, guidelines, and tools developed specifically for training higher education teachers. The pilot program aimed to bring about a transformation among stakeholders by introducing a training model that effectively harnesses ICT and digital environments in the context of higher education. Additionally, it sought to provide an innovative training model that could be replicated by other higher education institutions, thus promoting online teaching and essential teaching competences in the digital era.

The training program consisted of two modules, each with a distinct focus: (1) the module 1 was about online teaching and learning; while the (2) module 2 was about gamified learning. In this paper we'll focus on the second module, which was divided into 4 learning activities. In the first one, participants were introduced to the basic theoretical background of educational gamification and main characteristics. Then they must analyse some international case studies and, working in small groups, reflect on the main advantages and disadvantages of gamified learning in Higher Education. During the second activity basic educational gamification design principles were presented to the participants, along with an overview of the tools most used to implement gamified learning at the Higher Education level. Working in small groups, participants had to design and develop a self-assessment learning activity using the tool Kahoot!. Moving on, participants were asked to propose their plan for the implementation of a gamified learning activity in an Higher Education course. They were specifically encouraged to reflect on the obstacles they could face, when implementing gamification in a course, and to propose strategies to overcome them. Finally, in the last activity, participants had the chance to self-evaluate their work and afterward to look at the work of other groups and provide them with feedback and suggestions to improve it.

The participants

The pilot training program was designed to cater to a diverse group of individuals, including university teachers, tutors, doctoral and postdoctoral students, as well as researchers who were interested in enhancing their teaching practices in online settings, all of them being members of the Universities partners of the ECOLHE project: University of Patras (UPAT) - Greece; Universitat Oberta de Catalunya (UOC) - Spain; University of Applied Sciences (LAUREA) - Finland; University College Cork (UCC) - Ireland; Link Campus University (LCU) - Italy; Università degli Studi Roma Tre (Roma Tre) - Italy. Overall, a total of 128 participants enrolled in the pilot training program across all partner countries. Out of the total 128 participants who enrolled across all partner countries, only 40 successfully completed the pilot training course. Among the participants who completed the course, 34 were university teachers, 1 was a doctoral/postdoctoral student, 1 was a researcher, and 4 belonged to other categories. The participants in the pilot training program comprised individuals of various genders, with a majority being women.

Pilot training implementation

The pilot training was conducted online and spanned a duration of three months, specifically from March 2022 to May 2022. It was structured in two webinars and four learning activities as summarised in the following table (Table 1).

Table 1. Structure of the training

ACTIVITY	AIM	WORKLOAD
WEBINAR introduction	Introduction to the training	2h
ACTIVITY 1	Analysis of different gamified learning experiences carried out at the HE level	4h
ACTIVITY 2	Design of a self-assessment gamified learning activity (using the tool Kahoot!)	10h
ACTIVITY 3	Strategies to effectively implement gamified learning in HE courses	8h
ACTIVITY 4	Gamified learning activities evaluation	4h
WEBINAR conclusion	Conclusion and training evaluation	2h
	Total	**30h**

Feedback from the participants

The final synchronous webinar had the specific purpose to assess the pilot training and gather feedback from the participants regarding their experiences. During this session, e-facilitators encouraged the participants to provide a brief presentation on the outcomes of their activities. In addition to the webinar, the evaluation process included a final questionnaire designed to measure the participants' progression in digital competences and gamification throughout the training.

A first feedback on the gamification aspects of the training was given by the participants from UPAT (EL) with two different points of view between experienced teachers and younger PhD students. In general, they all had some familiarity with these methods, but only a small number actually incorporated them in the classroom. While they didn't hold negative views towards gamification, they believed it played a minor role in the teaching process. Teachers generally lacked familiarity with gamification platforms like Kahoot, whereas PhD students appeared to be more knowledgeable and utilised them to some extent.

Despite this, the overall impression regarding the use of gamification methods was not negative. Age is probably a significant factor contributing to the discomfort felt by some participating teachers, as they

may be hesitant to change their teaching methods after many years. Conversely, PhD students expressed the belief that these methods should play a major role in future teaching procedures.

It should be noted that the belief that gamification has no relevance in the teaching process may be due to a lack of knowledge about what the theoretical and practical basis is for its best use. In this sense, teacher education and training plays a primary role in the effectiveness of this methodology.

UOC (ES) participants already had a large experience as online education professionals, so the proposed gamification has not been an added challenge for them. They observed that introducing Kahoot is very useful as a self-assessment tool, but it needs more integration in the global design of the training. Knowledge of new tools for online teaching or new uses of already known tools was highly valued as well.

Most participants from UCC (IE) had no prior experience with gamification, and this aspect of the pilot received positive feedback. Using Kahoot! for social science content proved to be a challenge that needed a little support from the facilitators to overcome.

The main problem was that many groups took on the ambitious task of incorporating a new digital tool for online teaching, which resulted in limited time dedicated to the gamification component of the course. This led to some confusion as they questioned the relevance of designing a Kahoot! activity that they were unlikely to use, given their focus on integrating a digital tool into their teaching practice. It would have been clearer for them if the gamification course had followed directly after the online teaching portion, allowing them to give it the attention it deserved. This would have aligned with their desire to explore and fully engage with the topic, especially because gamification was new for most of the participants and so it would have been better if it were presented to them in isolation and after completing the online teaching course.

Overall, participants acknowledged the relevance of the course topics and expressed the need for further training in these areas, even within the context of traditional universities. They particularly appreciated the course content being based on recent research papers and the effective presentation within the course workspace. The potential of gamification was recognized as offering new possibilities, although it also presented challenges when seeking practical solutions, particularly when students strongly adhered to traditional teaching methodologies. This concept was also underlined by participants from Roma Tre (IT) and Laurea (FI).

For the participant from Roma Tre (IT) the recommended online learning game resource, Kahoot!, proved to be quite limited as its full functionality required a paid subscription. Due to this limitation, the resource couldn't be fully leveraged for effective learning purposes.

The overall feedback from most of the participants was of acceptance and desire to deepen their knowledge of the gamification methodology, with some doubts about the possible practical challenges that it may bring and some resistance to adopt something new and change their well-known teaching methods. It is worth noting that the entire training, including the part on gamification, was greatly affected by the participants' lack of time particularly in terms of the commitment required in certain tasks. This factor was also decisive with regard to the acquisition and absorption of basic knowledge related to gamification, a key factor for its proper understanding and implementation. In addition to this, another element that definitely influenced participants' attendance and preparation was the difficulty on some occasions in understanding what was required of them, making it even more time-consuming to complete them. These two factors combined definitely made it more difficult to understand and how to apply in practice the concepts that were being explained during the training especially with regard to gamification, which in some cases remained a residual topic of the course.

These considerations should lay the foundation for building future trainings that target gamification in teacher education.

CONCLUSION

Gamification, with its integration of game elements and mechanics into educational settings, has emerged as a compelling approach to captivate and motivate students. Recognising its potential, the Erasmus+ project ECOLHE aimed to equip higher education teachers with the necessary knowledge and skills to effectively employ gamification in their teaching practices. Therefore, the six European universities participating in the ECOLHE consortium designed and developed an online training module focused on gamification fundamental concepts, practical implementation strategies, and assessment techniques tailored specifically for higher education contexts. Through a combination of instructional modules, interactive activities, and real-life examples, the program aimed to provide teachers with a solid foundation in gamification principles and empower them to apply these principles in their own classrooms. Alongside the online training program, the ECOLHE project emphasised the importance of establishing communities of practice, which can provide a platform for teachers to collaborate, share experiences, and exchange best practices related to gamification. By fostering interaction and knowledge exchange among educators, the ECOLHE project aimed to create a supportive network that further enriched teachers' understanding and implementation of gamification in higher education.

The pilot implementation of the online training program yielded encouraging results. Participant feedback highlighted the program's effectiveness in enhancing teachers' knowledge, confidence, and skills in implementing gamification. They also shared constructive feedback on how to improve the training. They suggested that it would have been clearer and more effective if the gamification module followed directly after the online teaching one, allowing them to give it the attention it deserved. Some participants mentioned that they faced challenges in understanding what was required of them, which made it more time-consuming to complete tasks. Clearer instructions would have facilitated their understanding and application of the concepts being taught, especially regarding gamification. Finally, Participants recognised the potential of gamification but mentioned the need for practical solutions and examples of its implementation. Providing more practical guidance and examples would help participants overcome potential challenges and better apply gamification techniques in their teaching practices.

These considerations, albeit derived from a limited pilot experience, hold potential value in informing the development of future training programs that specifically address the integration of gamification within teacher education.

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