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Gamification and game-based learning in higher education: a case study about teachers' expectations¹

Adozione della gamification e del game-based learning in ambito universitario: un caso di studio sulle aspettative dei docenti

di

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Abstract:

This paper is a qualitative case study which explores university teachers' attitudes towards gamification, their expectations about the use of a gamified approach in HE courses, and their willingness to adopt this approach. This study also intends to highlight strategies by which HEIs interested in promoting the adoption of gamified learning could affect the current gap between teachers' attitudes towards gamification and game-based learning, which is generally positive, and

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their actual use, which remains limited. The data were collected through focus groups involving 13 teachers, all in-service at Link Campus University, a private Italian university located in Rome, and analysed through qualitative content analysis. The main findings of this research suggest that providing teachers with appropriate training, guidance, and support during the design, development, and implementation phases of a gamified learning intervention could significantly reduce the current attitude-use gap.

Keywords: gamified learning, teachers' attitude, Higher Education, university

Abstract:

Il presente lavoro è uno studio di caso qualitativo che esplora l'atteggiamento dei docenti universitari nei confronti della gamification, le loro aspettative sull'uso di un approccio gamificato nei corsi universitari e la loro disponibilità ad adottare questo approccio. Lo studio intende, inoltre, delineare delle strategie che le Università interessate a promuovere l'adozione dell'apprendimento gamificato potrebbero attuare per colmare l'attuale divario tra l'atteggiamento degli insegnanti nei confronti della gamification e del game-based learning, che è generalmente positivo, e l'effettivo utilizzo di questi approcci, che rimane limitato. I dati sono stati raccolti attraverso dei focus group, a cui hanno partecipato 13 professori, tutti in servizio presso la Link Campus University, un'università privata italiana situata a Roma, e sono stati analizzati attraverso l'analisi qualitativa. I principali risultati di questa ricerca sembrano suggerire che fornire agli insegnanti una formazione adeguata, oltre a una guida e un supporto durante tutte le fasi del processo (progettazione didattica, sviluppo e implementazione di un intervento di apprendimento gamificato) potrebbero avere un impatto significativo nel ridurre l'attuale divario tra atteggiamento e utilizzo.

Parole Chiave: formazione gamificata, atteggiamento degli insegnanti, formazione superiore, università

1. Introduction

Studies on educational gamification and game-based learning have been conducted at all educational levels; however, in the past few years, a significant increase in research carried out specifically in the context of higher education (HE) has been observed (Manzano-León et al., 2021; Subhash & Cudney, 2018).

In combination with the impulse towards innovation provided by the Bologna Declaration and the creation of the European Higher Education Area (EHEA), the change in expectations and characteristics of the current cohort of university students may be one of the reasons behind the growing interest in the use of gamification strategies at the higher education level. In fact, the largest cohort of students in HEIs today is composed of Millennials (also known as Generation Y) and Generation Z, who have certain distinctive characteristics compared to previous generations (Turner, 2015). In particular, both of these generations of students are more comfortable with technology than their predecessors and have grown up with video games (Glover, 2013). Consequently, they are familiar with the language of video games and are open to the possibility of learning through them (Prensky, 2003).

Although the adoption of gamified learning may be fostered by the expectations of new generations of students and even in light of the encouraging results reported by many of the studies carried out so far, the actual use of gamified learning at the HE level, as at any other educational level, depends largely on the willingness of teachers to implement it (Ketelhut & Schifter, 2011; Mumtaz, 2000), and currently only a minor fraction of university teachers routinely adopt gamification or game-based learning in their teaching practises (Martí-Parreño et al., 2016). In fact, experimenting with a new teaching approach can be an opportunity, but it also implies risks and demands an investment of time (i.e., to create new learning materials) or even money (i.e., to buy technical equipment).

Therefore, exploring teachers' attitudes towards gamification is extremely relevant for any higher education institutions (HEIs) interested in implementing it, in order to understand which are the more relevant drivers and barriers to its adoption and to implement adequate measures and strategies to support teachers in their effort to effectively integrate game elements into their courses.

The rest of the article is structured as follows: first, an overview is provided of the potential benefits of gamification and game-based digital learning, particularly in the context of higher education institutions. Then, the main findings of recent studies on higher education teachers' beliefs about gamification and game-based learning are summarised, highlighting the need for studies that specifically address factors that might influence the gap between attitudes towards and actual use of gamification and game-based learning. Finally, the results of a qualitative study that explored the main drivers and barriers perceived by university teachers to the adoption of gamification are presented and discussed.

2. Theoretical Framework

The renewal and innovation required of higher education didactics demand the continuous pursuit of those strategies and methodologies capable of enabling teachers to increasingly employ technologies to support the teaching-learning process.

This requirement is well outlined in the indications provided in some national and European documents, such as the *Piano Nazionale Scuola Digitale* (2015), which envisages a series of actions to achieve the effective integration of teaching with digital and technology use; and the *Digital Education Action Plan 2021-2127* (2020), which has among its various objectives the improvement of the quality and quantity of teaching related to digital technologies and support for the digitisation of teaching methods and pedagogies.

Therefore, there is a growing necessity to deliver and transmit university didactic content in a different way by exploiting the potential offered by online learning environments and responding to the ever-changing needs of the individual in training and of an evolving society. Traditional teaching methodologies are starting to fall short because, more and more, alongside knowledge, there is a demand for competences or soft skills, and students are expected to respond to this sudden change by demonstrating adaptability, flexibility, and the ability to learn new methodologies quickly.

Among the fields in which research is being carried out to verify such skills is the field of play and its educational potential (Garvey, 1979; Huizinga, 1946); in particular, the impact of using video games to build strategic, cognitive, emotional-motivational, self-regulatory, and future-oriented skills, which are considered indispensable from a lifelong learning perspective (Margottini & Rossi, 2017; Nuttin, 1964; Pellerey, 2013), is being investigated.

Indeed, this is a different way of teaching that finds its expression in gamification and game-based learning; two approaches that make it possible to convey, transmit, and construct educational content in a different and alternative way compared to the past (Ceccacci, 2020), thanks also to the use of platforms capable of providing students with new integrated learning environments that make educational experiences highly immersive.

2.1 The gamification approach and its effects on learning

Gamification began to be discussed in the early 2000s, when the term was mapped out in the literature on educational technology. In particular, the concept is introduced by Kapp in his book *The Gamification of Learning and Instruction* (2012) and refers to the use of playful game mechanics, game aesthetics, and playful thinking to motivate subjects' action, promote learning and problem-solving, in non-game contexts (Faiella & Ricciardi, 2015). It is aimed at engaging students, encouraging them to achieve certain goals, following pre-established rules and, possibly, enjoying themselves. It can find applications in many areas of the everyday life, typically those characterised by repetitive, boring actions.

According to international research, this approach is extremely beneficial at the educational level (Deterding et al., 2011). The potential of this approach can be found specifically in its defining elements. It allows, in fact, to design training actions that have positive effects on learning, with particular reference to intrinsic motivation, both at an individual level (dimensions of challenge, curiosity, control, and imagination) and at a social level (competition, cooperation, and recognition) (Bonaiuti et al., 2017). The results of research indicate, for example, that the structure of a video game can make learning more enjoyable, engaging, and captivating, since it enables the subject to gain a deeper knowledge of herself or himself (Gee, 2013; Granic et al., 2014; Hamari et al., 2014; Marsano, 2017).

This methodology also provides the opportunity to make educational pathways inclusive through a framework that adapts more easily to the educational needs of students and the necessities expressed by teachers (Vezzoli & Tovazzi, 2018).

Furthermore, another interesting aspect of this approach is its versatility, since research shows us that its use in the classroom, as homework, as a final exam, or as the main learning activity has positive effects on students' motivation and on the improvement of their skills (Faiella & Ricciardi, 2015).

The presentation of a subject with clear and specific objectives that must be achieved through the completion of a series of tests means that the subject must take responsibility for her or his choices. Among the positive aspects there is the feedback provided in a gamified system, which allows the student to constantly monitor the path followed, providing indications and suggestions on what to do to improve and gradually reach the objectives. In addition, the possibility of making mistakes allows the subject to face the challenge more confidently and to measure and enhance her or his abilities (Harter, 1978).

The reward and recognition system, which involves awarding points or issuing a badge each time the subject accomplishes a particular goal or completes a particular task, is another crucial component of gamification (Figuroa, 2015). Rewards are fundamental in the gamification design process, as is the ability to manage the game mechanics, which refer to the player's user experience, namely: scores,

levels, challenges, virtual goods, and rankings. These five 'mechanics' are closely linked to the game's 'dynamics', which refer to particular psychological effects, such as the need for:

- recognition of one's efforts (scores)
- social recognition and improvement of one's status (levels);
- achievement, overcoming a sudden obstacle (challenges);
- expressing one's individuality and diversity; and exchange (virtual goods);
- comparison-competition (rankings, 'leaderboards').

These five dynamics determine, in turn, a higher degree of engagement, knowledge retention (Levy, 2011; Marsh & Stock, 2006), and, thus, learning motivation.

This system of rewards also has a positive impact on the learning process, especially on a socio-emotional level, intensifying the motivation to learn, the participation of students in the educational dialogue, and the development, as already mentioned, of soft skills or 21st century skills (critical thinking, collaboration, creativity, problem solving). Therefore, the adoption of gamification can have positive effects on student learning and, when integrated with Game-based learning methodology, can improve the engagement and outcomes of the learning experience (Hanus & Fox, 2015; McGonigal, 2011).

2.2 Il Digital game-based learning

Game-based learning (GBL) is an emerging research field in the 21st century. Several studies have indicated that its application is not only a motivating idea, but also a didactic concept that, if implemented carefully, could be an alternative to traditional instructional design (Vlachopoulos & Makri, 2017).

Game-based learning, when integrated with digital (digital game-based learning - DGBL), is an educational strategy that employs games to teach specific content and achieve specific learning objectives. Through gaming, the learner acquires, reinforces, or enriches his or her knowledge and disciplinary content becomes challenging and fun.

As with gamification, in DGBL, games are considered ideal learning environments because, in addition to stimulating the development of motivation to learn, they make the learning process effective, since:

- the error is not considered a failure, but an opportunity to try again and look for a way to improve;
- feedback plays a central role because it helps the learner reconstruct the learning process and understand his or her own weaknesses;
- through play one is able to employ different strategies favouring authentic learning scenarios for individual or collaborative learning experiences (Kapp, 2012; Mawer & Stanley, 2011);
- at the metacognitive level, the learner is able to self-regulate, thus developing a greater sense of self-determination and self-efficacy with regard to the challenge he or she faces.

Therefore, digital game-based learning and gamification, although having different characteristics and extremely different implementation processes, are methodologies characterised by the same principle: to make learning more engaging, fun, and competitive.

2.3 Teachers' attitudes and expectations towards gamification

Teachers' willingness to effectively adopt gamification and game-based learning in their courses has been the subject of a number of studies aimed at identifying the existing primary drivers and major barriers, as well as giving suggestions to overcome these barriers. Recent systematic research conducted by Lester et al. (2023) revealed that university teachers are most motivated to experiment with gamification and game-based learning because they believe it will result in the following main benefits:

- increased student interactions and enhanced attitudes towards collaborative learning (Sánchez-Mena & Martí-Parreño, 2017);
- increased student engagement and enjoyment (Martí-Parreño et al., 2021; Sánchez-Mena & Martí-Parreño, 2016);
- increased student motivation (Fisher et al., 2014; Sánchez-Mena & Martí-Parreño, 2016).

In contrast, the most frequently cited barriers are:

- lack of time to develop gamification or game-based learning approaches (Martí-Parreño et al., 2021; Sánchez-Mena & Martí-Parreño, 2017);
- lack of studies demonstrating the benefits of gamification or game-based learning approaches (Desjardins et al., 2011);
- possible issues in managing classroom dynamics (Martí-Parreño et al., 2021; Sánchez-Mena & Martí-Parreño, 2017);
- problems related to the needed financial resources (Sanchez-Mena & Marti-Parreno, 2017).

Multiple studies suggest that teachers' attitudes towards gamification are a significant predictor of their intent to use it (Sánchez-Mena et al., 2017; Sánchez-Mena & Martí-Parreño, 2017). The study by Martí-Parreño et al. (2016) indicates that even when instructors have a positive attitude towards gamification, there is a disparity between attitude and implementation. Numerous studies have attempted to identify potential factors influencing this disparity, including instructors' gender, age, and institution type (Martí-Parreño et al., 2016); gaming habits and level of familiarity with games (Hayes & Ohrnberger, 2013; Marinensi & Romero Carbonell, 2021); attitudes, such as perceived utility and simplicity of use (Sanchez-Mena et al., 2017a, 2017b, 2019; Vanduhe et al., 2020).

These studies have documented how the exploration of teachers' attitudes, perceived barriers and support needs regarding the use of gamification is beneficial for any HEI considering the possibility of experimenting with gamified learning. Thus, this case study is intended to contribute to expand on previous studies by offering an insight into the views about gamification and game-based learning of a group of teachers in service in a private Italian university.

2.4 Research questions

This case study was carried out at Link Campus University (LCU), a private Italian university located in Rome. Its main aim was to gain a better understanding of LCU teachers attitudes towards gamification, their expectations about the positive and negative impacts of educational gamification, and their willingness to adopt a gamified approach in their courses. In particular, it was focused on the following research questions:

RQ1: What is the overall attitude of LCU teachers towards educational gamification and game-based learning?

RQ2: What are the main expectations of LCU teachers about the benefits and risks of adopting a gamified approach in a HE course?

RQ3: What are the factors influencing their willingness to adopt this approach?

3. Method

Three focus groups were carried out to collect information about LCU teachers' point of view about four main topics: (a) perception of students' level of motivation and engagement, and approaches currently adopted to foster their active participation in the learning process; (b) level of familiarity with games, gaming habits and general opinion about games; (c) willingness to adopt a new pedagogical practice to foster students' motivation and engagement; and (d) attitude towards gamification and the use of game elements to foster students' motivation and engagement. Informed consent was obtained from all participants before the focus groups were held. Two researchers were present during each focus group, one acting as a moderator and the other as an assistant moderator. The moderator followed an interview guide prepared beforehand through the subsequent main steps: (1) a first draft of the interview guide was prepared, based on a literature review focusing on topics relevant to the research questions; (2) subsequently, two education experts, both with experience in the field of pedagogical innovation in higher education, independently reviewed the interview guide and provided feedback on its appropriateness to achieve the research objective and on the clarity with which the questions were formulated; (3) their suggestions were implemented, and then the final interview guide was prepared (see Table 1).

Table 1. Focus groups interview guide

Introduction questions	Thoughts about the level of engagement and motivation of university students: <ul style="list-style-type: none"> - Would you describe them as motivated? - Have you ever struggled to keep them engaged? - What kind of approach do you generally use to foster their motivation and engagement?
Transition questions	Thoughts about the role of games in participants' everyday lives: <ul style="list-style-type: none"> - Would you describe yourself as a gamer? - Do you prefer digital or analogical games? - How much time do you spend playing?
Key questions	Attitude and expectations about educational gamification: <ul style="list-style-type: none"> - Are you familiar with the concept of "gamification"? - Have you ever used a gamified application (i.e., for learning a new language or for adopting a new habit)? - What is your general attitude toward the use of gamification or game-based learning in educational contexts? - Would you be willing to adopt a gamified approach in your classes?
Additional questions	Reflection on what was said during the discussion: <ul style="list-style-type: none"> - Does anyone have something further to add?

Each focus group began with an introduction and description of the purpose of the discussion, and by a brief presentation of each participant. Then, the moderator, following the interview guide, asked the participants several open-ended questions. The focus groups lasted for 70–95 minutes, were audio-recorded and transcribed verbatim.

3.1 Participants

A total of 13 teachers took part in the focus groups, all working at Link Campus University and teaching on both bachelor's and master's degree programmes, ranging in age between 33 and 56. The following table (Table 2) summarises the demographic data of the participants.

Table 2. Demographic data of the participants in the focus groups

		Number	Mean
Gender	Male	4	-
	Female	9	-
Age		-	39
Degree programs	Only bachelor's degree program	5	-
	Only master's degree program	3	-
	Both bachelor's and master's degree programs	5	-
Years of experience in teaching in HEIs		-	5

Of the thirteen participants, only one had previously adopted a structured gamified approach in multiple HE courses. However, eight participants reported having implemented some game-based activities in their teaching practice, and seven participants have already used gamified applications (with different aims, such as personal improvement, physical rehabilitation, learning, etc.).

3.2 Data Analysis

Data were analysed through qualitative content analysis (Weber, 1990; Hsieh & Shannon, 2005; Bardin, 2013), which has been defined by Hsieh and Shannon (2005) as “a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns”.

The approach adopted consisted of six main phases: reading and re-reading the data to become familiar with them; identifying the analysis units; organising the analysis units into categories (themes) based on the common aspects they share (Bardin, 2013); reviewing themes; defining and naming themes; producing the report of the study findings. The first part of the analysis was performed in the original language (Italian), but the themes were defined and named in English. The data were analysed using the CAQDAS software NVivo 12.

4. Results

Three overall themes resulted from the analysis of the focus groups' transcripts:

- The relationship between game and learning
- The effect of educational gamification on students
- Conditions for successful implementation of pedagogical innovation in HEIs

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For each theme, several sub-themes were identified, as summarised in the following table (Table 3).

Table 3. Themes and sub-themes revealed in the analysis

Themes	Sub-themes	Number of comments	Sample quotes from the participants
The relationship between game and learning	Game as medium for learning and personal growth	7	<p><i>"All media, in turn, have been accused of being harmful at the educational level, and now this is happening with video games, but this is due to a lack of knowledge of what gaming offers you in terms of participation, of bringing people together, of being a vehicle for useful information, of being a vehicle for culture."</i> (Female, age 53)</p> <p><i>"I have also used games in empowerment courses, and thus for personal growth, and I have found that, on an emotional level, games have a great impact."</i> (Female, age 53)</p>
	Game as a way to foster the creation of social bonds	5	<i>"Games are very effective as icebreakers, and they can help students get to know each other better and form strong social bonds."</i> (Female, age 45)
The effects of educational gamification on students	Higher engagement and motivation	13	<i>"The game engages and enthuses the students, who become more active, more motivated, and also happier."</i> (Male, age 43)
	Competitiveness vs collaboration	10	<p><i>"You really have to balance cooperation and competition well because otherwise students end up focusing on getting points and everything else becomes secondary, gamification no longer becomes a support for learning, study becomes the means to win at the game."</i> (Female, age 40)</p> <p><i>"I think collaboration should be preferred over competition, which may perhaps exist but between groups. In this way, someone who is less 'active' can be stimulated to get more involved by the other members of his group."</i> (Male, age 37)</p>
Conditions for successful implementation of pedagogical innovation in HEIs	Academic bodies commitment	9	<i>"The effort required to adopt this methodology is certainly considerable and would need to be recognised by the university."</i> (Male, age 37)
	The impact of technological aspects	7	<i>"There should be a ready-to-use system that I can fill with content, that is flexible, and can adapt to the specificity of the subject."</i> (Female, age 40)
	Receiving guidance and support	5	<i>"Actually having a point of reference with whom I can reason and redesign certain parts of the course, who can advise me on how to use the elements of the game,</i>

			<i>applying them to my specific field... I think, yes, that would definitely be the best thing.</i> " (Female, age 45)
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The analysis of the participants comments also allowed to identify the drivers and barriers (Table 4) to adopting a gamified approach at the HE level that the teachers perceived as the most relevant.

Table 4. Most relevant drivers and barriers of adopting gamification in HE

Drivers	Number of comments	Barriers	Number of comments
Increased students' engagement and motivation	15	Possible reduction of the teacher's authority and creation of classroom dynamics that are difficult for the teacher to manage	8
Stronger creation of social bonds among students and improved relationship with the teacher	10	Potential diminution of the importance of the subject in the eyes of the students	3
Better and easier monitoring of students' progress throughout the course	7	Lack of technical skills or inadequate technical support	2
		Lack of time	2
Total	32	Total	15

5. Discussion

Coherently with the literature highlighting that higher levels of student motivation and engagement are among the most common drivers for the adoption of gamification (Fisher et al., 2014; Sanchez-Mena & Marti-Parreno, 2017), the LCU teachers involved in the focus groups expected gamification to have a positive impact on their students' motivation and engagement and overall level of enjoyment of the learning experience. Specifically, a teacher stated:

"Some students have an attention problem, so I use games a lot with the objective not to amuse them, although they do have fun, but with the objective of stimulating their attention. And I must say that the results are very good, both for improving attention and concentration, and for fostering their level of involvement on the tasks." (Female, age 37)

Some of the participants also commented that the implementation of a gamified digital tool, such as a gamified learning management system, could ease the process of tracking individual learning progress, which is very valuable not only for the students but also for the teacher. On this point, a teacher explained:

"It would be useful [to have a gamified system] to understand which parts of a lesson or which lessons of the course were more effective or less effective. So, for me, as a teacher, it could be a tool to monitor the success of my course." (Male, age 32)

When imagining the feature that such gamified learning management system should have, teachers stressed the importance of flexibility and adaptivity to different students' characteristics and learning needs:

“In a gamified system, points are awarded for the completion of various tasks, but not all students find the same task equally difficult, e.g., some do better on written tests and some do better on oral tests. Therefore, if the system gives the same score to everyone, it penalises those who are less strong on that task and benefits those who are stronger on that task. A standardised gamified system, that awards points in a certain way that is the same for everyone, does not support people individually.” (Female, age 40)

One aspect that was considered from a two-fold perspective is the change in the teacher's role in a gamified course. Teachers were indeed aware that the implementation of an active learning method, as opposed to the traditional one, would also have an impact on teachers, prompting a transition from the role of lecturer to facilitator (Konopka et al., 2015; Misseyanni et al., 2018; Robertson, 2018). However, the participants in the focus groups seemed torn between recognising the potential of teaching strategies that incorporate game elements as a way to strengthen the bond between teacher and students, and the fear of losing authority in the less formal environment resulting from students playing games in the classroom.

On the one hand, in fact, one of the teachers stated:

“I consider play as an important teaching instrument that helps create a positive relationship with the class, and also has great potential in terms of personal emotional growth.” (Female, age 53)

On the other hand, however, other teachers expressed the following concerns:

“Due to the general perception of games as childish activities, with the sole aim of entertaining the players, students may perceive educational content delivered through games as less serious, less valuable than contents delivered in more traditional ways.” (Male, age 43)

“I find educational games very interesting, but they also have to be managed very well because they can trigger complicated dynamics that you have to know how to manage and not necessarily that the teacher knows how to do so.” (Female, age 53)

When discussing the factors that could contribute to fostering their willingness to try a gamified approach in their course many suggestions were made. Among them, receiving an adequate level of support both from a technological and a methodological point of view was often mentioned.

“I would be inclined to try it, I would also be interested in doing so for my own personal growth as a teacher, but I would need support, especially if it involves rethinking a whole course from scratch.” (Female, age 35)

“Receiving initial training would be useful, of course, but I don't think it would be enough to make me autonomous in applying the method. So, I guess, to really get results, I would have to devote a semester to redesigning and testing my own course, having continuous support during that semester.” (Female, age 37)

Due also to the barrier of the lack of time and the perceived lack of technical skills that some of the teachers mentioned, the advantage of having a ready-to-use tool, such as a gamified learning management system, was pointed out. However, such a tool should be very user friendly and also flexible and possibly modular, to better adapt to the characteristics of the subject to be taught and of the students. In addition, a flexible and modular solution could allow teachers to decide the degree of implementation of the gamification in their course, allowing them to start small and feel more in control and confident in the management of the classroom.

6. Conclusion

The main goal of this case study was to gain a better understanding of LCU teachers' attitudes towards gamification (RQ1), their expectations about the main benefits and risks of implementing a gamified approach at the HE level (RQ2), and some factors affecting their willingness to try adopting this approach in their courses (RQ3).

As for RQ1, the results of this study highlighted a general positive attitude of participants towards gamification and the use of game elements as part of the teaching practice. There were indeed more than twice as many positive comments as negative ones (35 comments highlighted the benefits of gamification, compared to only 15 drawbacks). None of the teachers declared to be opposed to the idea of adopting a gamified approach in their courses, and more than half of the teachers have already tried implementing some game-based activities in their teaching practice (9 teachers out of 13).

The most relevant expected benefits (RQ2) of educational gamification included: enhancing engagement and fostering students' motivation (8 comments); guiding the students in their learning process, by providing them with short- and medium-term goals and constant feedback (7 comments); and easing the creation of social bonds among students (7 comments). Many potential risks (RQ2) have been identified as well, among them: diminishing of the teacher's authority (4 comments); overtaking of competition on collaboration (3 comments); and diminishing of subject importance in the eyes of the students (3 comments) were the most frequently mentioned by the participants.

In coherence with previous research carried out on this topic, the results of this study show the existence of an attitude-use gap in educational gamification (Martí-Parreño et al., 2016; Sánchez-Mena et al., 2016; Blume, 2020). In fact, even though the overall attitude towards gamification shown by the teachers involved in this study was positive, only one of them had previously adopted it. Main factors negatively affecting their openness to experiment with gamification (RQ3) include lack of time, lack of training and guidance, and the perception that the technology involved is not easy to use, available or reliable. These results seem to suggest that offering teachers adequate training, guidance, and support during the design, development and implementation stages of a gamified learning intervention could significantly impact the current attitude-use gap. In addition, to be welcomed by teachers, any gamification structure should be very solid from a theoretical point of view and based on extensive empirical evidence, to offer adequate reassurance that the

implementation of the elements of the game will not have negative repercussions on classroom management.

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