DIGITALEDUCATIONREVIEW

An example of gamification for pre-service teachers in online higher education: methods, tools, and purpose

Milagros Torrado Cespón[1*], Patricia Bárcena Toyos[2]
[1] Universidad Internacional de La Rioja, Spain, milagros.torrado@unir.net, https://orcid.org/0000-0002-3213-8405
[2] Universidad Internacional de La Rioja, Spain, patricia.barcena@unir.net, https://orcid.org/0000-0003-2942-1768

ABSTRACT

Using gamification in teaching practice can be highly effective if educators understand its application. Recognising potential confusion surrounding theoretical approaches to gamification, this paper analyses a specific example of gamification using ICT/ICRT tools for online master's degree students. It details the design steps, encompassing theoretical foundations, online tools, narrative elements, and practical links to the gamification experience.

This study investigates the impact of gamification on student engagement and satisfaction in a virtual classroom setting. A total of 116 participants completed a questionnaire adapted from GAMEFULQUEST (Högberg et al., 2019) to assess their experiences after engaging in a series of gamified challenges. The questionnaire, translated and validated for Spanish-speaking students, evaluated seven dimensions of gamification: Accomplishment, Challenge, Competition, Guided, Immersion, Playfulness, and Social Experience.

Results indicated high levels of satisfaction, particularly in Playfulness (M=5.84) and Accomplishment (M=5.83), suggesting students valued both the enjoyment and sense of achievement derived from the tasks. Although satisfaction was generally high across all dimensions, the Social Experience dimension received a lower rating (M=5.01), highlighting an opportunity to enhance social connections among students.

These findings underscore gamification's transformative potential in boosting motivation and engagement, especially in higher education. The study emphasises the importance of aligning gamified experiences with students' needs and incorporating elements that foster interaction and narrative engagement. It also recommends further research to explore the long-term effects of gamification on learning outcomes and to identify best practices for its implementation in diverse educational settings.

KEYWORDS: Gamification; ICT tools; teacher training; active methodologies.

1 INTRODUCTION

Creating a gamified experience for your students seems always a good idea but, sometimes, teachers do not know how to start or, even, if they are performing a gamification or something else. Being a trending methodology, offering teachers and teachers-to-be a theoretical foundation is not enough, because an actual development of a gamification will provide them with a more tangible base to work with. Having the opportunity of observing actual gamifications is a way of improving or checking others' ideas. Thus, this paper shares the construction and application of gamification practises in use for the sake of offering other teachers ideas to design their own. This does not mean that this proposal is better or worse than others: it just is to be taken as a possibility. The gamification described in this paper follows the theoretical principles described by relevant authors regarding emotion (Lazzaro, 2004) the hero's journey (Campbell, 2017), gamification principles (Robson et al, 2015; Werback & Hunter, 2012) and motivation. Moreover, being this an online gamification, it also considers the need of using information and communication technology (ICT) or even information, communication and interaction technology (ICIT) and offers examples of different tools which can help us to gamify. Although based on the realm of higher education, it can be extrapolated to other levels with some minor adaptations. Additionally, the specific aim of this gamification in its original context is to replace end-of-unit tests in two online master's degrees, one in Teaching English as a Foreign Language and one in Bilingual Education, so this paper also reflects on the use of gamification as a formative assessment activity that provides opportunities for meaningful learning and immediate feedback on students' performance. It is important to highlight that the participants of this gamification were in-service and pre-service teachers who can also benefit from experiencing active methodologies that they can apply with their own students.

1.1 Objectives

This article aims at sharing the results of accomplishing gamification with master's students and its effects on motivation. Additionally, this article aims at sharing ideas to design a gamification in the classroom. To do this, it includes a full description of a gamified experience carried out in an online university context which has been designed considering the main aspects of gamification design pointed out by different authors and considering the needs of teachers and teachers-to-be in an online environment. Finally, we include the results of a survey on students' perceptions of the effects of gamification.

2 GAMIFICATION IN EDUCATION

2.1 Definition

Gamification in education can be defined as the use of elements of game design in educational contexts. One of the main problems for applying gamification in the classroom is not being sure about the concept, as there are two others that can confuse the user. In the triad gamification – serious games – game-based learning, the boundaries become blurred. Game-based learning (GBL) can be considered the most transparent. In GBL, teachers use games to teach with the aim of working competences and didactic contents, adapting them to the educative level (Teixes, 2015; Yildrim, 2023). Serious games are games used in the realm of education that were designed with a teaching purpose in mind. The main difference between gamification and serious games is that, in the latter, the purpose of playing is for mere enjoyment while gamifications are used in non-game contexts that resemble real-life situations (Moreno Ger et al, 2008, Baptista et al. 2024). In a gamification, learners commonly have to successfully perform a series of tasks, earning different rewards at the end of the challenge, such as the use of points, leader-boards and badges (Murillo et al, 2021). Receiving these rewards increases students' motivation for the task and, it even improves the learner's self-perceived competence in the subject (Zainuddin, 2018; Manzano-León et al. 2022), not to forget higher levels of engagement in learning (Li, Ma & Shi, 2023). So, the potential of gamification for improving individual learning at different levels, such as "learner performance, assessment outcomes and longitudinal engagement" (Willig et al, 2018, p. 5) is widely accepted. This has led to its use in different educational contexts, including online higher education.

Along with gamification, it is important to be aware of breakouts. These are often mistaken for gamification but are indeed a type of micro-gamification where participants must open a lock (real or virtual) by solving riddles or questions about the topic suggested (Negre, 2017). Thus, a breakout can be part of gamification, but it is not gamification per se.

2.2 Gamification in Higher Education

The use of gamification in higher education has gained importance in the last few years as a tool to motivate university students and increase their participation in the course they are involved. The reported benefits of gamification lay mostly in the improvement of students' motivation (Fernández Portero & Castillo Rodríguez, 2022) but also in the belief that if students' motivation and engagement increase, their content knowledge and achievement in the subject should also increase (Santos Villalba et al, 2020). However, there are still inconclusive results regarding learners' academic achievement under gamified courses. Some studies have reported the short-term and long-term benefits of gamification assessment in improving students' exam grades (Díaz Ramírez, 2020), but others, such as Hanus and Fox's study (2015), concluded that the gamified course negatively impacted motivation and exam grades. Different factors can influence the effects that gamification has on students' motivation and achievement and instructor must be aware of them to propose the suitable gamification for their target groups (Kabilan, Annamalai & Chuah, 2023). On the one hand, long-term gamifications (i.e. those lasting between 2 and 16 weeks) are less effective in keeping students' motivation which, in turn, might impact their academic achievement (Kim & Castelli, 2021). On the other hand, learners' age is also a factor that can impact their engagement in gamification. Also, according to Kim and Castelli (2021), adult learners are more engaged than K-12 or even college students, because adults give more importance to achievement through progress than immediate rewards. Nonetheless, well-designed gamified tasks that incorporate authentic assessments and higher-order thinking can foster creativity and critical thinking, enhancing digital and active learning skills (Kabilan, Annamalai & Chuah, 2023; Oliveira et al., 2023)

At the university level, gamification is also considered a potentially effective tool to promote key competences, such as active learning (Barata et al, 2015; Jones, Blanton & Williams, 2023) and, in the case of online higher education, digital competence, too. Through the accomplishment of different challenges, learners are performing tasks that resemble real-life situations, making gamification an authentic assessment task (Mahoney, 2017) that strengthens active and meaningful learning. Additionally, used as online assessment activities, gamifications give students immediate feedback on their performance, which helps them become aware of their learning progress and encourages learners to be creative and apply higher-order thinking skills (Gottlieb, 2016; Hernanz et al. 2024).

Online-based gamification is also expected to have repercussions on university students' future teaching practices. The pedagogical choices of teachers are affected by teachers' beliefs and professional identities, which they establish through formal education, professional development training and their own experiences as students themselves (Torrado Cespón & Díaz Lage, 2022). So, through exposure to the online tools used for the gamification and to the gamified assessment experience, it is expected that teacher trainees will apply them in their teaching practice.

2.3 Gamification for motivation

The term gamification starts to be used as a kind of umbrella term to name any practice which involves a game-like experience in a situation that does not involve a game. As mentioned above, gamification is just a possibility among other ludic approaches to teaching. Gamification in teaching should be fun and not a result of fashionable trends. This needs preparation and careful design (Torrado Cespón & Gómez Domingo, 2021) otherwise, a supposed ludic activity will not bring the desired results and will result in what Mollick and Rothbard (2014, p. 13) named "the paradox of mandatory fun" even if it is not. If gamification does not work with a target group, either because the teacher lacks preparation or because the students are not interested, it should be not used forcibly.

In the design process is necessary to consider both Werbach and Hunter's (2012) game element hierarchy and Robson et al's (2015) design of the MDE framework. Werbach and Hunter (2012) deal with the use of dynamics (narrative and social interaction), mechanics (the element that drives player involvement) and components (specific examples of the game, such as points). On the other hand, Robson et al (2015) talk about the three principles of gamification: the mechanics of the game (regarding the set-up, the rules and the progression), dynamics (types of player behaviour) and emotions (the mental affective states and reactions evoked). Although several researchers defined other proposals for gamification components (see Swacha (2023) summary), Robson et al. and Werach and Hunter are to be considered as perfectly valid and useful.

To start planning a gamified experience, we must design the set-up mechanics, which will determine the setting, the characters, and the narrative, among others. So, when designing gamification or gamified practices in general, imagination is crucial for the creator. Although there are ready-made templates available (check Genial.ly described below) the teacher must create the story to be told. A narrative is an essential part of gamification, but not everybody possesses the creativity to craft wonderful stories. That is why is it always good to look at other teachers' proposals.

To plan the narrative of a gamification, it is worth considering the hero's journey monomyth (Campbell, 2017; Vogler, 2008) on which adventure stories are based. Although not a compulsory requirement in gamification, the hero's journey provides the user with a logical scenario which increases motivation (Gunder & Buckner, 2023) This journey, which starts with the call to adventure, offers the participant a reason to start the game. The hero's journey includes several steps which can be fitted into the three-act structure, that is, departure, initiation, and return. Vogler's (2008) adaptation is one of the most used nowadays and, although is not necessary to follow all the steps included, it is always a good way of thinking about how to start (fig. 1).

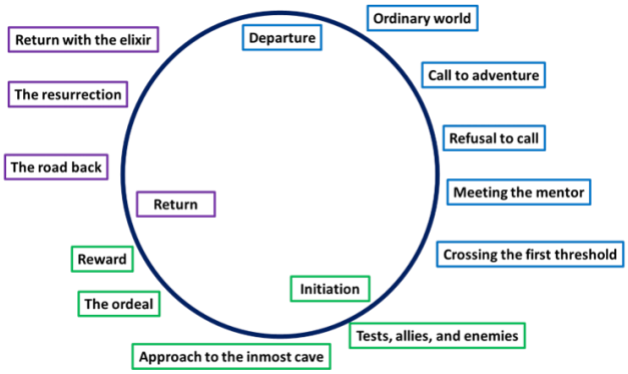

Figure 1. Hero's journey (Vogler, 2008).

The narrative should be also in accordance with the target group's interests. In the case of the gamification presented in this paper, the target group was composed of EFL teachers, so the main characters in the narrative are also EFL teachers. Their objective is also related to their background: reconstructing the sabotaged lesson plans. A good choice in the narrative will make it meaningful. Knowing the interests of your target group is not always possible. Considering online students as in this example, the teacher will have problems to get in touch with them directly. Add, also, they are adults who lack time and the natural intrinsic learning interest children have. Whatever the plan, it must consider that their needs are usually quite specific: obtaining a title. This extrinsic motivation that moves them does not imply creating dull and boring gamifications and leaving intrinsic motivation apart. It is worth considering Reiss' 16 motives (fig. 2) (Reiss, 2004) and applying them to your target group as a way of constructing a more personalised experience (Schaffer & Fang, 2024).

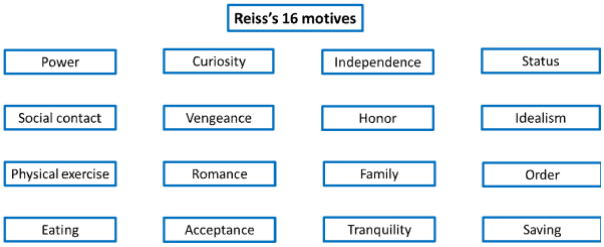

Figure 2. Reiss's 16 motives (Reiss, 2004).

The progression mechanics of gamification will determine the rewards that players will receive as they make progress in the game. The most common elements of gamification rewards are points, badges or leader-boards (Sánchez et al, 2020; Hafdi & Alhalafawy, 2024). In this gamification, students receive a badge after they successfully complete each challenge. Even though the recommendation is not to use extrinsic rewards, especially in the case of activities that are interesting per se, in the case of gamification we find an exception (Buckley et al, 2018). However, these rewards are to be understood in their game-like context and not as a way of promoting extrinsic motivation in an already motivating activity.

Following Robson et al.'s principles (2015), the dynamics of gamification refer to the negative or positive behaviours that students show while taking part in the gamified activity, for example, being more competitive when they know they are being assessed. So, unlike mechanics, the dynamics of gamification cannot be planned ahead, but both principles have an effect on students' emotions. In a gamified activity, students are expected to have positive emotions resulting from enjoyment, which will, in turn, make them feel motivated ((Torrado Cespón & Gómez Domingo, 2021; An, 2023; Perez-Aranda, Medina-Claros & Urrestarazu-Capellán, 2024), leading to increased participation and longer exposure to the content, which is expected to impact students' academic results (Santos Villalba et al, 2020). Any emotion—including frustration, wonder or amazement—has a place in gamification by connecting the learner to the experience itself or impacting the decision-making process during the game (Lazzaro, 2004).

2.4 Tools

The use of online tools is compulsory when designing online gamifications. One of the problems teachers and pre-service teachers face when trying to choose among all the possibilities available is the total time inversion. Looking for tools is demanding and implies a lot of trial and error until the most suitable appears, a quest that already starts during their time at university (Castillo & Díaz, 2020; Kaur, 2023). Using tools such as Symbaloo will help teachers in this gathering with the possibility of using web mixes which are far more visual than keeping web links in a document (Castillo Rodríguez & Torrado Cespón, 2020) (fig. 3).

Figure 3. Symbaloo with all the tools used in this gamification (https://www.symbaloo.com/mix/gamification-tools-js3u

Information and communication technology (ICT) applied to teaching shares more and more ground with information, communication, and interaction technology (ICIT), a way of providing more authenticity to their use. The term ICIT is gaining ground since it was proposed by Garrido Lora, Munté Ramos and Busquet Duran (2016). According to these authors, the term ICT is limiting for defining the reality of technology nowadays, which does not only include just communication anymore, but technology users now also relate to each other through formal or informal social networks. Within gamification, the role of ICIT tools is especially relevant when the action involves competence among students since there is a ranking where they observe their score and their classmates.

Within the range of tools available for creating a gamification, it is also necessary to distinguish between base tools and complementary tools. Base tools are those which can integrate the whole gamification so the participants can navigate it. It can be used externally or within the virtual campus as in the example in this paper. Geniall.ly and Symbaloo Learning Paths are the base tools chosen here (see description

below), but it is also worth exploring the possibility of creating a specific web page for the gamification. Google sites or Wix are good free examples of base tools that are easy to manage with little practice (see Castillo Rodríguez & Torrado Cespón, 2020).

Regarding complementary tools, these are those which offer different ways of including content within the base tool. Tools which offer from the possibility of online quizzes, personalized video games, crosswords, or stories to the creation of badges, virtual padlocks, or fake news. The inclusion of too many of them in the same gamification can result in overwhelming for the participants, so this choice also needs careful design.

3 DESIGN

3.1 Format and target group

This gamified experience was offered to a total of 116 students from the online university Universidad Internacional de La Rioja (Spain). The total of participants was made of 51 (37 female; 14, male) students from the master's degree in Teaching English as a Foreign Language (MTEFL) and 65 (female; ,male) from the master's degree in Bilingual Education (MBE). The gamification was embedded as part of the subjects Intercultural Communication and Language Teaching (MTEFL) and What is CLIL? The CLIL Module (MBE) with a double objective. On one hand, providing students with a different way of revising content by eliminating the usual end of unit revision tests which provided up to 1 point for continuous assessment. On the other, being master's degrees for teachers, providing them with ICT and ICIT tools in context to construct gamifications in the future teaching practice. While the subjects were different and dealt with different topics, the format followed for the gamification was the same in both subjects, so for the aim of this article, we refer to the gamification as one.

The target group is, therefore, formed by adults who already have a degree related to teaching. They have also chosen an online university because it offered them the highest level of balance between work (many of them are already working as teachers) and family life. They are all interested in obtaining the degree for either intrinsic (learning) or extrinsic reasons (obtaining a title). Considering Reiss's 16 motives (2004), it is a target group that moves towards power (efficacy), curiosity (wonder), independence (freedom), status (self-importance), idealism (compassion), order (stability), acceptance (self-confidence), and tranquillity (safe). These eight motives were considered for the design of the narrative below. A previous gamified practice tried in a similar group (online students, adults) served as a way of mending the errors derived from the alienation appreciated in the teacher-student online relationship (Torrado Cespón & Díaz Lage, 2022) offering a gamified practice integrated in the course which they can take voluntary but which is perceived as part of the teaching process.

To design this gamification, the authors have considered all the above requirements to promote motivation, engagement, and positive emotions. The whole gamification was embedded in the subject's virtual campus, so there is no need to leave the subject to perform it. This gamification was applied during the whole semester, and it appears divided into challenges following the guidelines of breakouts and considering Werbach and Hunter (2012). Therefore, each challenge included a final question the student must send to the teacher as a task that she would assess. For a better application, each unit or units under the same topic were part of each challenge (see Table 1 and Table 2)

Challenge	Units
Challenge 1	Units 1 + 2 Integration of content and language in CLIL
Challenge 2	Units 3 + 4 Learning in CLIL
Challenge 3	Units 5 + 6 Authentic language and materials
Challenge 4	Unit 7 Designing CLIL lessons
Challenge 5	Unit 8 4 Cs: Content
Challenge 6	Unit 9 4Cs: Cognition
Challenge 7	Unit 10 + 11 4Cs: Communication
Challenge 8	Unit 11 4Cs: Culture

Table 1. Challenge division in MTEFL

All challenges follow a similar structure regarding content:

- Revision of theoretical contents:
- Challenges 1, 3, 4, 6 and 7: explanation and questions about the content
- Challenges 2, 5: explanation.
- A final question to send.

Challenge	Units
Challenge 1	Units 1 + 2 Integration of content and language in CLIL
Challenge 2	Units 3 + 4 Learning in CLIL
Challenge 3	Units 5 + 6 Authentic language and materials
Challenge 4	Unit 7 Designing CLIL lessons
Challenge 5	Unit 8 4 Cs: Content
Challenge 6	Unit 9 4Cs: Cognition
Challenge 7	Unit 10 + 11 4Cs: Communication
Challenge 8	Unit 11 4Cs: Culture

Table 2. Challenge division in MBE

Regarding format, each challenge is different to provide the students with different structures as examples as would be detailed in the next sections. Following is a description of the tools used and the narrative.

3.2 Base tools

The applications chosen as base tools are those which offer the possibility of integrating the narrative within them. It is worth exploring them in detail to discover their potential. The description below considers just the main points.

- Genial.ly (https://genial.ly/) is a well-known tool among teachers and teachers-to-be that provides them with updated templates, ready to edit and use and perfect for gamification and breakouts. Moreover, it also offers the possibility of creating your own design. Even though you can include questioning resources within the template you are using, it also permits inserting other tools. The templates are classified according to topics and uses (for example gamification, science, math). It is a very intuitive tool with the possibility of updating for better use.
- Google Docs (https://docs.google.com) offers the possibility of creating desktop documents online. It is a wonderful tool for cooperative work and to share simple presentations and documents.
- Powtoon (https://www.powtoon.com/) is a platform to create videos based on different characters and backgrounds. It offers the possibility of inserting links. It is a good resource for storytelling.
- Learning Paths by Symbaloo (https://learningpaths.symbaloo.com/) is a lesson plan creator with a ludic perspective. The users travel along the lesson plan with a joystick. The objectives of the lesson appear on the first slide. It offers the possibility of inserting their own quizzes but also embedded tools, similarly to Genial.ly.

3.3 Complementary tools

- To provide the learners with more tools for their future teaching practice, this gamification included other resources to complement the base tools. This can be classified into several categories:
- Online video sites: places where you can obtain videos about almost any content. YouTube (https://www.youtube.com/) can be considered more general while Vimeo (https://vimeo.com/) pursues a more professional use of online video.
- Online teaching resources: within this category, there are those applications created with the intention of adapting school contents to different interactive formats, such as matching exercises or multiple question activities among others. Here we include Learningapps (https://learningapps.org/) and Educaplay (https://es.educaplay.com/).
- Online storytelling: these tools are used with the intention of telling a story employing different approximations. On one hand, Storyboarthat (https://www.storyboardthat.com) offers static comic-like stories the user can personalise with the resources available. Powtoon, as explained before, is more dynamic.
- Video games: Wordwall (https://wordwall.net/) and Classtools (https://www.classtools.net/) offer many didactic possibilities. In this gamification, they were chosen because of the possibility of using video games as tools where the teacher can embed the contents to revise.
- Mind maps: as a way of summarising information in a visual form, this gamification uses Goconqr (https://www.goconqr.com/) and Genial.ly. Both tools offer more possibilities, but mind maps are one of them.
- False social networks: to bring the students reality and also dealing the fake news phenomena, these tools to write fake messages from different sites or applications provide a realistic appearance without being real. For Twitter and Facebook, Prank Me Not (https://www.prankmenot.com/) and WhatsApp Fake Chat (http://www.fakewhats.com/) for WhatsApp.

- Musical resources: for those applications which do not include music or to add other music, there are sites specialised in music for multimedia and games. This gamification used Patrick de Arteaga's web page (https://patrickdearteaga.com/).
- Badges: there are many pages to choose from although the possibility of designing original badges from scratch is an interesting possibility that allows further personalisation of the badges. In this gamification, badges were designed in Makebadges (https://www.makebadg.es/).

Another resource included in the gamification is the web page CleverCookie (https://www.clevercookie.es/) designed specifically to suit the needs of Spanish speakers when using EFL. CleverCookie is included here as a resource because of its linguistic contents but also because it presents the grammatical information in a ludic way through short videos (Torrado Cespón & Santos Díaz, 2023).

It is also worth noting that the gamification includes an analogical resource, as is the case of Playmobil. This use was intentional to offer students offline tools: a camera and their imagination.

3.4 Narrative

As an essential part of the gamification, the narrative that pushes the player to play is considered by Werbach and Hunter (2012) as an important part of the dynamics. The narrative considers the background of the students choosing the characters accordingly. In the case of MTEFL, the students are meant to work for the main characters, two EFL teachers who are trying to reconstruct the stolen lesson plans. Considering the autonomous access to the gamification by the students as it is embedded in the campus, it includes an introduction after they finish reading Unit 1. This provides the students with enough information to understand what they can expect instead of the usual tests they find in other subjects (fig. 4).

Figure 4. Presentation

In MBE serves as the hero of this narrative. In the first challenge, students are introduced to a "Mission Impossible"-style adventure, through an encrypted message presented in a Powtoon video. This message sets the narrative: to help Doyle understand the principles of the CLIL approach. Doyle is the principal of a major bilingual institution who is at a crossroads in his career due to some voices against bilingual education.1

After this, the narrative is presented with an online tool (Powtoon) where three teachers are discussing what they can do, for all the English lesson plans have been sabotaged (fig. 5). As the first challenge englobes units 1 and 2, it appears at the end of unit 2.

Figure 5. Powtoon (https://www.powtoon.com/ws/dpRg2W31Zqd/1/m)

[1] Considering the limited space to describe both gamified practices thoroughly, this article presents only examples from the MTEFL. The other follows the same division and construction.

Considering this is a gamification and not just a mere sequence of challenges, the narrative continues during the other challenges as an introduction to them and as a way of summarising the main point of the units to revise. This is done in some of the challenges just to remind the students the challenges are part of a bigger experience.

- Challenge 2, unit 3: These teachers are doing a great job with the reconstruction of the lost lesson plans, but they need to understand the complexity of discourse.
- Challenge 3, units 4 and 5: In their search for the best ideas for their lesson plans, our English teachers, who knows how, have appeared on a different planet! One of them feels uneasy. Help him! (fig. 6).
- Challenge 6, units 8 and 9: Your lesson plan looks very good, but are you aware of the different ways English is spoken across the world? (fig. 7).

Figure 6. Challenge 3 presentation (https://www.powtoon.com/s/fHlYQzG65Tj/1/m/s)

Figure 7. Challenge 6 main page https://view.genial.ly/61890678ac0c810dcc69d042)

The case of challenge 4 is different. As this challenge revises unit 6 about critical literacy and critical thinking, it uses storytelling technique during the challenge and tells a story of a teacher who is in trouble with the introduction of intercultural communication in the EFL classroom. The Genial.ly chosen for this challenge presents the aesthetics of classical fairytales (fig. 8).

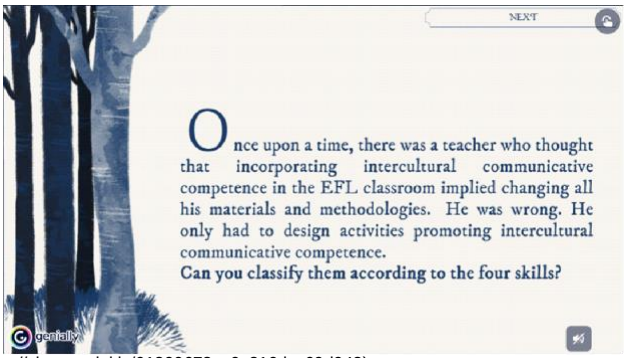

Figure 8. Challenge 4 parallel narrative (https://view.genial.ly/61890678ac0c810dcc69d042)

The narrative finishes when all the challenges have been completed (see fig. 9 as example). Here, apart from thanking the students for their participation, there is also a link with all the resources used during the gamification (see fig. 3 above) and a link to the questionnaire that measured students' satisfaction with the gamification, which will be described in the next section.

Figure 9. Final Powtoon (https://www.powtoon.com/online-presentation/cQCBJJiFovj/?mode=movie).

Therefore, the construction of this narrative is based on the hero's journey main phases:

- Departure: the teachers are at school, willing to start the new academic year. The lesson plans have disappeared, and a solution is needed. At first, they feel helpless, but the head of the department encourages them, and they start their journey.
- Initiation: they meet their allies, the students, who are solving the challenges with them. Some challenges are more difficult than others and they need to keep on trying. Finally, they get their rewards (badges and points).
- Return: they come back to the head of the department who congratulates them on their good job.

3.5 Badges

This gamification does not imply an extra prize or extrinsic reward that pushes the student into playing. However, as it was made as a part of the subject's continuous assessment, that reward is inherent to it. However, providing it with a more game-like aspect (Sánchez, Langer & Kaur, 2020), each challenge also includes a completion badge (fig. 10) the teacher sends via campus to the students to confirm their answers are correct. The inclusion of further reward can be considered by the teacher, but a previous gamification applied in a similar group showed that the inclusion of a reward (extra points for the exam) did not mean a significant increase in participation. Since this gamification is part of the subject, the inclusion of badges was considered motivating enough by the teachers and also as an example of what they could create for their future teaching practice.

Figure 10. Badges given at the end of each challenge.

4 METHODOLOGY

116 participants took the questionnaire online after they completed the last challenge in the gamification. Participation was voluntary and anonymous.

To measure students' satisfaction with the gamification, the authors adapted the questionnaire GAMEFULQUEST (Högberg et al., 2019) and translated it into Spanish. The translation was then validated by a group of experts. The decision to translate the questionnaire into Spanish was made because it was the students' native language, ensuring a better understanding of the questions and increasing the reliability of their responses. The instrument included 34 statements that assessed seven key dimensions of gamification through 7-point Likert scale questions. These dimensions are: motivation to improve and complete the task (Accomplishment); motivation from effort exerted (Challenge); influence of competition on motivation (Competition); perception of academic progress and feeling supported in the process, for example, through feedback (Guided); ability to concentrate and immerse oneself in the narrative (Immersion); creative and imaginative capacity (Playfulness); and the feeling of participating in a shared social experience (Social experience).

Data were an analysed quantitatively, using descriptive statistics.

5 RESULTS

The analysis of data showed that, overall, the students reported high levels of satisfaction with all seven dimensions of gamification. The mean (M) scores for all dimensions ranged from 5.01 to 5.84 on a 7-point Likert scale, indicating that most students rated them positively (see Table 3).

The highest levels of satisfaction were reported for Playfulness (M=5.84) and Accomplishment (M=5.83), which means that students felt a strong sense of achievement in completing the gamified tasks and enjoyed the fun nature of the gamification.

	Accomplishment	Challenge	Competition	Guided	Immersion	Playfulness	Social experience
Valid	116	116	116	116	116	116	116
Mean	5.83	5.40	5.31	5.55	5.39	5.84	5.01
SD	1.29	1.22	1.51	1.41	1.43	1.29	1.55
Min.	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max.	7.00	7.00	7.00	7.00	7.00	7.00	7.00

Table 3. Descriptive statistics of results

Additionally, positive ratings in Guided (M=5.55) and Immersion (M=5.39) suggest that the gamification provided clear guidance and helped students feel immersed in the learning experience, which can increase motivation and engagement. While the score for Competition was moderate (M=5.31) in comparison with other dimensions, it still suggests that the gamified elements introduced a healthy sense of competition, which can motivate some students to strive for excellence. In fact, the SD in this dimension was the highest, suggesting that there was more variation in students' opinions in this dimension compared to others. Finally, while still positive (M=5.01), students were slightly less satisfied with the Social experience of the gamification experience. This could mean that, because this gamification did not include leader boards, as other gamifications might do, and students completed challenges individually, their sense of being part of a social experience was lower.

6 DISCUSSION

Using gamification in the virtual classroom is a double-edged tool: it is visually appealing, yet engaging students can be challenging. In a previous gamified experience, students did not show the expected level of involvement (Torrado Cespón & Díaz Lage, 2022). Thus, this current approach followed a more careful analysis of the target group's needs. The results indicate a high level of participation and satisfaction among students, with a majority feeling more motivated and prepared for future teaching practices. This positive feedback suggests that gamification not only enhances engagement but also contributes to a deeper understanding of the tools and techniques that can be utilized in future educational settings.

The distinction between base tools, which support the core gamification structure, and complementary tools, which enhance content delivery, highlights the necessity of thoughtful integration. A well-designed gamification experience balances these tools to prevent overwhelming students, emphasising the importance of careful planning (Sánchez, Langer & Kaur, 2020). The iterative nature of gamification design, as reflected in adjustments made based on student feedback, indicates a commitment to continuous improvement. This adaptability is crucial for responding to learners' unique needs and refining educational practices over time. Gamification can work wonders in the classroom if the methodology is well understood (Werbach & Hunter, 2012). The global access to information facilitates the application of approaches and methods that might otherwise require extensive explanation or training. Attending gamification seminars or courses is beneficial not only for the training itself but also for the enrichment that comes from listening to colleagues. Sharing examples of active methodologies can promote knowledge accessibility and should be a fundamental principle of teaching practice. Creating a sense of global community among teachers who share methods and ideas aligns with the objectives of academic research, facilitating effective communication strategies, obtaining feedback, and building strong relationships among researchers (Palomino et al., 2021).

However, new teaching trends should align with both the educator's teaching style and the target group's needs. Not all students will engage with gamification at the same level or be equally involved. While using ICT/ICIT tools for gamification is a valuable strategy, it becomes ineffective if a digital divide exists (Cabero & Ruiz-Palmero, 2018; Torrado Cespón, 2021). The evolution of technology in education reflects a shift towards a more holistic understanding of its role, emphasising authentic interactions through gamification, particularly in competitive contexts (Garrido Lora et al., 2016). The choice of online tools is crucial for effective gamification. Teachers face challenges in identifying suitable tools due to the overwhelming number of options and the time required for research and experimentation (Castillo & Díaz, 2020; Kaur, 2023). This underscores the need for structured guidance in tool selection to streamline the process for educators.

Regarding the future application of gamified practices, it is essential to promote non-technological gamified experiences in the classroom, especially in primary school settings where social skills development is critical. Regardless of the context, educators should consider their

objectives and design the best narrative to engage students. The narrative component of gamification is vital for fostering engagement, framing challenges within a motivating story. By aligning challenges with students' backgrounds and interests, the narrative enhances the learning experience and fosters a connection to the material.

7 CONCLUSIONS

Based on the data provided, the gamified learning experience was highly successful in engaging students and promoting a positive learning environment.

This could suggest that the gamification was engaging, making the learning experience more enjoyable, and provided opportunities for students to achieve goals, which can be strong motivators.

The findings underscore the transformative potential of gamification in enhancing student engagement and motivation within the educational framework. By carefully selecting and integrating tools, creating engaging narratives, and responding to student feedback, educators can optimise the gamification experience, making it a powerful ally in modern teaching practices. Furthermore, fostering a collaborative community among educators can enrich the collective knowledge base and support ongoing improvement in teaching methodologies.

Based on results from the questionnaire, the gamified learning experience was highly successful in engaging students and promoting a positive learning environment.

Students reported high levels of satisfaction with all seven dimensions of gamification, indicating a positive overall experience. They valued the sense of accomplishment and the fun and engaging tone of the gamification. However, there is potential for improvement in fostering stronger social connections among students.

So, the implications of this study are, first, that gamification can be a powerful tool for enhancing student engagement and motivation, which is even more important in higher education. Second, as we have shown in this article, when designing gamified learning experiences, it is important to incorporate elements that promote a sense of accomplishment and make the activities enjoyable and engaging, using the elements of gamification that we have illustrated in this study. Third, while the social dimension of gamification was generally positive, efforts should be made to foster stronger social connections among students, especially in online or hybrid learning environments. Finally, additional research is needed to explore the long-term effects of gamification on student learning outcomes and to identify best practices for implementing gamified learning experiences in different educational contexts.

Overall, the findings from this study suggest that gamification can be a valuable tool for enhancing student engagement, motivation, and learning outcomes. By carefully considering the key dimensions of gamification and addressing potential areas for improvement, educators can design effective gamified learning experiences that benefit students of all ages and backgrounds.

Acknowledgments

This research is part of the projects:

VIEALI-RIOJA (ref. PP-2022-02, Universidad Internacional de La Rioja (UNIR)); innovation project DIGILEARN (ref. IE23.1004, Universidad Politécnica de Madrid) and EN-GAME (ref. PIE22-152, Universidad de Málaga).

We also want to thank the support provided by Digital Learning innovation group (Universidad Politécnica de Madrid) and the Technology to Learn (T2T) (ref. D5-2023_14, Universidad de Málaga)

REFERENCES

Al-Hafdi, F. S., & Alhalafawy, W. S. (2024). Ten Years of Gamification-Based Learning: A Bibliometric Analysis and Systematic Review. *International Journal of Interactive Mobile Technologies*, *18*(7), pp. 188–212. https://doi.org/10.3991/ijim.v18i07.45335

An, Y. (2023). The Impact of Gamification on Doctoral Students' Perceptions, Emotions, and Learning in an Online Environment. *TechTrends*, *67*, 706–717. https://doi.org/10.1007/s11528-022-00833-7

Baptista, R., & Coelho, A. Training and Certification of Competences through Serious Games. *Computers*, *13*(8), 201. https://doi.org/10.3390/computers13080201

Barata, G., Gama, S., Jorge, J., & Gonçalvez, D. (2015). Gamification for smarter learning: Tales from the trenches. *Smart Learning Environments*, *2*(1), 10. https://doi.org/10.1186/s40561-015-0017-8

Buckley, J., DeWille, T., Exton, C., Exton, G., & Murray, L. (2018). A gamification–motivation design framework for educational software developers. *Journal of Educational Technology Systems*, *47*(1), 101–127.

Cabero, J., & Ruiz Palmero, J. (2018). Las tecnologías de la información y la comunicación para la inclusión: reformulando la brecha digital. *International Journal of Educational Research and Innovation*, 9, 16-30. https://www.upo.es/revistas/index.php/IJERI/article/view/2665

Campbell, J. (2017). The hero with a thousand faces. Yogi Impressions.

Castillo Rodríguez C., & Díaz Lage, J.M. (2020). Creation of digital materials and activities in bilingual subjects: measuring ICT tools' popularity in a postgraduate academic context. In N. Aguayo Arrabal (Ed.). *Educación de las Segundas Lenguas* (pp. 75-84). UCOPress.

Castillo-Rodríguez, C.; Torrado-Cespón, M. (2020) Follow the Path: a Learning Proposal for the EFL Flipped Classroom. *Digital Humanities Journal*, *2* (1). https://doi.org/10.21814/h2d.2539

Díaz Ramírez, J. (2020). Gamification in engineering education–An empirical assessment on learning and game performance. *Heliyon*, *6*(9), e04972. https://doi.org/10.1016/j.heliyon.2020.e04972

Fernández Portero, I., & Castillo Rodríguez, C. (2022) Gamification in the English language class: Analysis of pre-service teachers' perceptions. *Computer Assisted Language Learning Electronic Journal (CALL-EJ)*, *23*(1), 425-444. http://callej.org/journal/23-1/Fernandez-Portero-Castillo-Rodriguez2022.pdf

Garrido Lora, M., Busquet Duran, J., & Munté Ramon, R.A. (2016). De las TIC a las TRIC. Estudio sobre el uso de las TIC y la brecha digital entre adultos y adolescentes en España. *Anàlisi: Quaderns de Comunicació i* Cultura, 54, 44-57.

Gottlieb, M. (2016). *Assessing English language learners: Bridges to educational equity: Connecting academic language proficiency to student achievement*. Corwin.

Gunder, A., & Buckner, M. (2023) Story as Pedagogy: Leveraging Narrative Digital Learning Practices in the Instructional Design Process. *Ubiquity Proceedings*, *3*(1): 210-215. https://doi.org/10.5334/uproc.88

Hanus, M.D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort and academic performance. *Computers & Education*, *80*(1), 152-161. https://doi.org/10.1016/j.compedu.2014.08.019

Hernanz, V., Latorre-Cosculluela, C., Suárez, C., Lanchares-Sancho, E. (2024). Revitalising learning in three university contexts: Unleashing the power of the Quizizz app to increase self-efficacy, intrinsic motivation, satisfaction and performance. *Education and Information Technology*. https://doi.org/10.1007/s10639-024-12779-9

Högberg, J., Hamari, J. & Wästlund, E. (2019) Gameful Experience Questionnaire (GAMEFULQUEST): an instrument for measuring the perceived gamefulness of system use. *User Modeling and User-Adapted Interaction*, *29*, 619–660. https://doi.org/10.1007/s11257-019-09223-w

Jones, M., Blanton, J. E., & Williams, R. E. (2023). Science to practice: Does gamification enhance intrinsic motivation? *Active Learning in Higher Education*, *24*(3), 273-289. https://doi.org/10.1177/14697874211066882

Kabilan, M.K., Annamalai, N. & Chuah, KM. (2023) Practices, purposes and challenges in integrating gamification using technology: A mixed-methods study on university academics. *Education and Information Technologies*, *28*, 14249–14281. https://doi.org/10.1007/s10639-023-11723-7

Kaur, K. (2023). Teaching and learning with ICT tools: Issues and challenges. *International Journal on Cybernetics and Informatics*, *12*(3), 15-22. 1 https://doi.org/10.5121/ijci.2023.120302

Kim, J., & Castelli, D.M. (2021). Effects of gamification on behavioral change in education: A meta-analysis. *International Journal of Environmental Research and Public Health*, *18*(7), 3550. https://doi.org/10.3390/ijerph18073550

Lazzaro, N. (2004). *Why we play games: Four keys to more emotion without story*. Retrieved from http://gamemodworkshop.com/readings/xeodesign_whyweplaygames.pdf

Li, M., Ma, S., & Shi, Y. (2023). Examining the effectiveness of gamification as a tool promoting teaching and learning in educational settings: A meta-analysis. *Frontiers in Psychology*, 14, 1253549. https://doi.org/10.3389/fpsyg.2023.1253549

Mahoney, K. (2017). *The assessment of emergent bilinguals: Supporting English language learners*. Channel View Publications.

Manzano-León, A., Camacho-Lazarraga, P., Guerrero, M. A., Guerrero-Puerta, L., Aguilar-Parra, J. M., Trigueros, R., Alias, A. (2021). Between level up and game over: a systematic literature review of gamification in education. *Sustainability*, *13*, 2247. https://doi.org/10.3390/su13042247

Mollick, E. R., & Rothbard, N. (2013). Mandatory fun: Gamification and the impact of games at work. *SSRN Electronic Journal.* https://doi.org/10.2139/ssrn.2277103

Moreno Fuentes, E. & Lopezosa Martínez, M. D. (2020). Gamificación a través de un proyecto de aprendizaje -servicio: diseñando un breakout educativo desde la universidad para el alumnado de primaria. *Eticanet*, *20*(1), 106-130. https://doi.org/10.30827/eticanet.v20i1.15524

Moreno Ger, P., Burgos, D., Martínez Ortiz, I., Sierra, J.L., & Fernández-Manjón, B. (2008) Educational game design for online education. *Computers in Human Behavior*, *24*(6), 2530-2549. https://doi.org/10.1016/j.chb.2008.03.012

Murillo Zamorano, L.R., López Sánchez, J.A., Godoy-Caballero, A.L., & Bueno Muñoz, C. (2021). Gamification and active learning in higher education: is it possible to match digital society, academia and students' interests? *International Journal of Educational Technology in Higher Education*, *18*(1), 1-27. https://doi.org/10.1186/s41239-021-00249-y

Negre, C. (2017). 'Breakoutedu', Microgamificación y Aprendizaje Significativo. Educaweb. *Educación, formación y trabajo*. Retrieved from https://www.educaweb.com/noticia/2017/07/26/breakoutedu-microgamificacion-aprendizaje-significativo-15068/

Oliveira, W., Hamari, J., Shi, L., Toda, A., Rodriguez, L., Palomino, P., Isotani, S. (2023). Tailored gamification in education: A literature review and future agenda. *Education and Information Technology*, *28*, 373–406. https://doi.org/10.1007/s10639-022-11122-4

Palomino Fernández, J.M., Cáceres Reche, M.P., & Ramos Navas-Parejo, M. (2021). E-liderazgo y enseñanza a distancia en educación superior. Principales claves. In J.A. Marín Marín, J.C. de la Cruz Santos, S. Pozo Sánchez, & G. Gómez García (Eds.), *Investigación e innovación educativa frente a los retos para el desarrollo sostenible*. Dykinson.

Perez-Aranda, J., Medina-Claros, S. & Urrestarazu-Capellán, R. (2024). Effects of a collaborative and gamified online learning methodology on class and test emotions. Education and Information *Technology*, *29*, 1823–1855. https://doi.org/10.1007/s10639-023-11879-2

Reiss, S. (2004). Multifaceted nature of intrinsic motivation: The theory of 16 basic desires. *Review of General Psychology*, *8*(3), 179-193. https://doi.org/10.1037/1089-2680.8.3.179

Robson, K., Plangger, Kietzmann J. H., McCarthy, L., & Pitt, L. (2015) Is it all a game? Understanding the principles of gamification. *Business Horizons*, *58*(4), 411–420.

Sánchez, D. R., Langer, M., & Kaur, R. (2020). Gamification in the classroom: Examining the impact of gamified quizzes on student learning. *Computers & Education*, 144, 103666. https://doi.org/10.1016/j.compedu.2019.103666

Santos Villalba, M.J., Leiva Olivencia, J.J., Ramos Navas-Parejo, M., & Benítez Márquez, M.D. (2020). Higher education students' assessments towards gamification and sustainability: A case study. *Sustainability*, *12*(20), 8513. https://doi.org/10.3390/su12208513

Schaffer, O., Fang, X. (2024). Player experience. In C, Stephandid and G. Salvendy (eds.) *Human-computer interaction in various application domains* (chap. 6). CRC Press. https://doi.org/10.1201/9781003490692

Swacha, J. (2023). Meaningful Typology of Gamification Components. *27th International Conference on Knowledge-Based and Intelligent Information & Engineering.*

Teixes, F. (2015). *Gamificación: Fundamentos y Aplicaciones*. UOC Business School.

Torrado Cespon, M. (2021) TIC/TAC y COVID-19: uso y necesidades del profesorado de secundaria en Galicia. *Digital Education Review*, 39, 356-373. https://doi.org/10.1344/der.2021.39.%25p

Torrado Cespón, M. & Díaz Lage, J.M. (2022). Gamification, online learning and motivation. A quantitative and qualitative analysis in higher education. *Contemporary Educational Technology*, *14*(4), ep381. https://doi.org/10.30935/cedtech/12297

Torrado Cespón, M. & Gómez Domingo, M. (2021) Emotion in online gamification. A case study with pre-service primary school teachers. *XI International Conference on Virtual Campus (JICV)*,, pp. 1-3. https://doi.org/10.1109/JICV53222.2021.9600351.

Torrado Cespón, M. & Santos Díaz, I. (2023). Evaluation of the CleverCookie tool for learning and teaching English as a foreign language. In I. Santos Díaz, M. Torrado Cespón, S. López Pérez & J.M. Díaz Lage (Eds) *Current Trends on Digital Technologies and Gaming for Teaching and Linguistics*. Peter Lang.

Vogler, C. (2008). *The Writer's Journey: Mythic Structure for Writers*. Michael Wiese Productions.

Werbach, K., & Hunter, D. (2012). *For the win: How game thinking can revolutionize your business*. Wharton Digital Press.

Willig J., Croker, J., McCormick, L., Nabavi, M., Walker, J., Wingo, N.P, & Redden, D. (2018). Gamification and education: A pragmatic approach with two examples of implementation. *Journal of Clinical and Translational Science*, *5*(1), E181, 1-7. https://doi.org/10.1017/cts.2021.806

Zainuddin, Z. (2018). Students' learning performance and perceived motivation in gamified flipped-class instruction. *Computers & Education, 126*(1), 75-88. https://doi.org/10.1016/j.compedu.2018.07.003

UN EXEMPLE DE GAMIFICACIÓ PER A ESTUDIANTS DE MÀSTER D'ENSENYAMENT DE L'ANGLÈS EN LÍNIA: MÈTODES, EINES I OBJECTIU

L'ús de la gamificació a la pràctica docent pot ser molt eficaç si els docents comprenen la seva aplicació. Reconeixent la confusió potencial que envolta els enfocaments teòrics de la gamificació, aquest article analitza un exemple específic de gamificació utilitzant eines TIC/TRIC per a estudiants de màster en línia. S'hi detallen els passos de disseny, que abasten fonaments teòrics, eines en línia, elements narratius i enllaços pràctics a l'experiència de gamificació.

Aquest estudi investiga l'impacte de la gamificació en la participació i la satisfacció dels estudiants en un entorn d'aula virtual. Un total de 116 participants van completar un qüestionari adaptat de GAMEFULQUEST (Högberg et al., 2019) per avaluar les seves experiències després de participar en una sèrie de desafiaments gamificats. El qüestionari, traduït i validat per a estudiants de parla hispana, va avaluar set dimensions de la gamificació: Assoliment, Desafiament, Competència, Guiat, Immersió, Diversió i Experiència Social.

Els resultats van indicar alts nivells de satisfacció, especialment en Diversió (M=5.84) i Assoliment (M=5.83), cosa que suggereix que els estudiants valoraven tant la diversió com la sensació d'èxit derivada de les tasques. Tot i que la satisfacció va ser generalment alta en totes les dimensions, la dimensió d'experiència social va rebre una qualificació més baixa (M=5.01), cosa que destaca una oportunitat per millorar les connexions socials entre els estudiants.

Aquestes troballes subratllen el potencial transformador de la gamificació per augmentar la motivació i el compromís, especialment a l'educació superior. L'estudi emfatitza la importància d'alinear les experiències gamificades amb les necessitats dels estudiants i incorporar-hi elements que fomentin la interacció i el compromís narratiu. També es recomana fer investigacions addicionals per explorar els efectes a llarg termini de la gamificació en els resultats d'aprenentatge i per identificar les millors pràctiques per implementar-les en diversos contextos educatius.

PARAULES CLAU: gamificació; TIC; Formació del profesorat; Metodologies actives

UN EJEMPLO DE GAMIFICACIÓN PARA ESTUDIANTES DE MÁSTER DE ENSEÑANZA DEL INGLÉS ONLINE: MÉTODOS, HERRAMIENTAS Y OBJETIVO

El uso de la gamificación en la práctica docente puede ser muy eficaz si los docentes comprenden su aplicación. Reconociendo la confusión potencial que rodea los enfoques teóricos de la gamificación, este artículo analiza un ejemplo específico de gamificación utilizando herramientas TIC/TRIC para estudiantes de máster online. Se detallan los pasos de diseño, que abarcan fundamentos teóricos, herramientas en línea, elementos narrativos y enlaces prácticos a la experiencia de gamificación.

Este estudio investiga el impacto de la gamificación en la participación y satisfacción de los estudiantes en un entorno de aula virtual. Un total de 116 participantes completaron un cuestionario adaptado de GAMEFULQUEST (Högberg et al., 2019) para evaluar sus experiencias tras participar en una serie de desafíos gamificados. El cuestionario, traducido y validado para estudiantes de habla hispana, evaluó siete dimensiones de la gamificación: Logro, Desafío, Competencia, Guiado, Inmersión, Diversión y Experiencia Social.

Los resultados indicaron altos niveles de satisfacción, especialmente en Diversión (M=5.84) y Logro (M=5.83), lo que sugiere que los estudiantes valoraban tanto la diversión como la sensación de logro derivada de las tareas. Aunque la satisfacción fue generalmente alta en todas las dimensiones, la dimensión de Experiencia Social recibió una calificación más baja (M=5.01), lo que destaca una oportunidad para mejorar las conexiones sociales entre los estudiantes.

Estos hallazgos subrayan el potencial transformador de la gamificación para aumentar la motivación y el compromiso, especialmente en la educación superior. El estudio enfatiza la importancia de alinear las experiencias gamificadas con las necesidades de los estudiantes e incorporar elementos que fomenten la interacción y el compromiso narrativo. También se recomienda realizar investigaciones adicionales para explorar los efectos a largo plazo de la gamificación en los resultados de aprendizaje y para identificar las mejores prácticas para su implementación en diversos contextos educativos.

PALABRAS CLAVE: gamificación; TIC; Formación del profesorado; Metodologías activas