

LEARNING STYLES AND GAMIFICATION IN ENGLISH CLASSES AT HIGHER EDUCATION

Estilos de aprendizaje y gamificación en clases de inglés en la educación superior

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Abstract

Students' learning styles and gamification benefit academic performance. The objective of this case study was to identify the language learning experiences of students with different learning styles in a gamified learning class. Nine participants, between 19 and 32 years old, from the English II course in a semi-scholarly mode, in the faculty of administration of a Higher Education institution located in central Mexico, were interviewed. The results indicated a high preference for the visual and dependent style, positive perceptions towards gamification, and a change in attitude toward learning English, as well as improvements in vocabulary, listening comprehension, and pronunciation. It is concluded that gamification and students' learning styles increase their predisposition to learn English.

Keywords: foreign language, higher education, learning, strategies.

Resumen

Los estilos de aprendizaje de los estudiantes y la gamificación benefician el rendimiento académico. El objetivo de este estudio de caso fue identificar las experiencias de aprendizaje de idiomas de estudiantes con diferentes estilos de aprendizaje en una clase de aprendizaje gamificado. Se entrevistaron a nueve participantes, entre 19 y 32 años, del curso de Inglés II en modalidad semiescolarizada, en la facultad de administración de una institución de Educación Superior ubicada en el centro de México. Los resultados indicaron una alta preferencia por el estilo visual y dependiente, percepciones positivas hacia la gamificación y un cambio de actitud hacia el aprendizaje del inglés, así como mejoras en el vocabulario, la comprensión auditiva y la pronunciación. Se concluye que la gamificación y los estilos de aprendizaje de los alumnos aumentan su predisposición a aprender inglés.

Palabras clave: aprendizaje, educación superior, estrategias, lengua extranjera.

Recibido: 02/04/2024
Revisado: 11/06/2024
Aprobado: 25/06/2024
Publicado: 15/07/2024

DOI: <https://doi.org/10.32541/recie.v8i2.716>

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ISSN (impreso): 2636-2139
ISSN (en línea): 2636-2147
<https://revistas.isfodosu.edu.do/>

Cómo citar: Aldama-Juárez, B., Caipe-Colimba, N., Ruiz-Romero, I., & Juárez-Díaz, C. (2024). Learning styles and gamification in English classes at higher education. *RECIE. Revista Caribeña de Investigación Educativa*, 8(2), 151-168.
<https://doi.org/10.32541/recie.v8i2.716>

1 | Introduction

It is necessary to underline the urgency of integrating learning styles (LSs) into teaching planning and organization. Sánchez-Cotrina (2023) and Briones and Yangali (2020) found a notable correlation between learning styles and learning outcomes. Therefore, university teachers should employ strategies that consider how students learn most effectively.

Learning styles are an area of study that helps to observe academic performance. Teachers should become adept at applying methodologies adapted to the particularities of each style (Llor & Alarcón, 2021). Additionally, teachers should recognize students' LSs and consider using gamification (Briones & Yangali, 2020). Gamification is a didactic resource (Latorre & Marín, 2023) and serves as a convenient classroom alternative to intensify student participation and interest in course activities, creating an attractive and motivating atmosphere (Navarro-Sempere et al., 2022).

With proper execution, gamification is a strategy that can enhance learning by considering LSs, as it is an active and innovative technique to achieve meaningful learning. It was observed that teachers favor innovation and the use of gamification as a teaching strategy (Balseca et al., 2022).

Gamification represents a shift away from traditional teaching methods (Valdez-Enriquez, 2022). According to Peñalva et al. (2019), teachers appreciate gamification because they believe games facilitate learning; however, they warn that poor implementation could isolate students from the learning environment.

Baldeón et al. (2017) also mentioned that learners found gamification enjoyable and were willing to participate in gamified activities. However, some students reported that they did not fully enjoy the activities due to an overloaded agenda. Moreover, games are an excellent tool that facilitates academic training, participation, and the acquisition of theoretical knowledge (Rodríguez et al., 2019).

Gamification benefits language learning in higher education; it motivates and involves students, increases their attention, and positively influences their behavior, thereby improving their language skills (Huseinović, 2023). Additionally, Boudadi and Gutiérrez-Colón (2020) suggest that gamification is a relevant tool for motivating and engaging students in language learning. There is increasing interest in exploring the effects of gamification on language outcomes due to its potential to promote language learning.

Sánchez-Cotrino (2023) and Panmei and Waluyo (2022) agree that there is a gap in identifying student experiences in gamified contexts through qualitative studies. More research on gamification and learning styles to increase English vocabulary is necessary (Waer, 2021). Studies on gamification in higher education are needed, as many current studies are concentrated on basic education levels (Huseinović, 2023). Regarding gamification and its effects on language learning, the lack of unambiguous empirical results highlights the need for more studies to provide solid empirical evidence. So far, the results obtained do not categorically demonstrate a positive influence of gamification on language learning (Boudadi & Gutiérrez-Colón, 2020). Additionally, implementing gamification in educational environments facilitates learning since humans naturally learn through games (Huseinović, 2023).

On the other hand, language learning can be more effective when addressing students' LSs (Al-Seghayer, 2021). Based on the background signaling the role of learning styles and gamification in promoting English learning, the general objective of this study was to identify the language learning experiences of students with different learning styles in a gamified learning environment.

2 | Literature review

2.1 Learning styles

Physical context, psychological conditions, and environmental variables influence learning. Therefore, some students prefer music, food, warmth, bright light, isolation, daytime hours, and comfortable seating to study. Others choose the opposite: silence, cold weather, dim light, evening hours, company, or studying in groups; these conditions favor learning (Hedge, 2000).

In a classroom, it's crucial to recognize the multitude of physical and cognitive differences among students. When we delve into cognitive traits, we uncover the concept of learning styles (Pulido, 2014). Learning styles are not just a theoretical construct but a practical tool that can significantly impact the teaching and learning process. They refer to how students harness their intellectual capacities to learn (García, 2017).

Escanero (2008) defines LSs as a way of processing information and achieving meaningful learning through strategies; he also highlights that LSs can undergo alterations. Alonso et al. (1997) agree that LSs are

relatively stable patterns of students when learning and developing in their learning environment; these patterns are the product of the combination of characteristics of different natures, such as cognitive, affective, and physiological. The LSs have been classified in various ways depending on the type of LS model, which can be mental, multifactorial, or sensory. Learning styles can be seen in behaviors and ways of coping with tasks. Students reveal their learning style by everything they say or do not say, do, and succeed or fail to do. Most students act according to their learning style, and applying validated instruments can help obtain an accurate and reliable student profile (Leaver, 1997).

Lozano et al. (2016) created an instrument to label student LSs; they retook eight LSs from different models: analytical, global, dependent, independent, theoretical, practical, visual, and verbal. The eight learning styles describe the way of learning and the teaching-learning strategies that should be encouraged in each of the LSs. One of the models is Kolb's proposal (1984); he considers that individual preferences, perception, information analysis, and experience influence learning; for him, LSs are convergent, divergent, assimilators, and accommodators. An additional model is the one proposed by Fleming and Mills (1992), who states that students use their senses to learn and deal with the information presented to them in their learning environment. To this end, they suggest the LSs: visual, auditory, reading-writing, and kinesthetic sensory modalities. In the same way, Pulido (2014) estimates that the visual, auditory, and kinesthetic or kinesthetic channels help in acquiring knowledge. Finally, in Witkin and Goodenough's classification (1977), the interpersonal behavior of field dependence and independence was considered.

2.2 Gamification

Gamification is derived from the Anglo-Saxon word "game," which teachers implemented in the educational field to increase student motivation by employing different strategies and methods. It is conceived as a distribution of elements whose artificial design provides a natural, playful, and immersive character based on motivation (Tejero, 2021). Gamification became famous in 2010; its purpose in education is to engage and motivate student learning. After seeing how much time players spend devoted to World of Warcraft, it was thought that it provides a game that people would enjoy playing in educational contexts (Pitoyo & Asib, 2020). Changing a learning experience into a game-like experience can help influence motivation and behavior; gamification can help find solutions to difficulties and make people initiate activities voluntarily (Zichermann & Cunningham, 2011).

Gómez (2020) indicates that gamification can be seen as an approach, practice, or process where the elements and principles of game design are applied to a non-game context, in this case, in the language classroom. There are different definitions of gamification; Chou defines it "as the craft of deriving fun and engaging elements found typically in games and thoughtfully applying them to real-world or productive activities" (Chou, 2019, p. 8).

Gamification should not be considered a grading system. The advantages of gamification are participation, personalization, teamwork, commitment, determination, and progression. On the other hand, some disadvantages are the themes of the activities, which can sometimes become sensitive; unclear and inconsistent dynamics; lack of motivation to participate; risky behaviors; excessive immersion; and apathy or rejection towards non-gamified activities (Gaviria, 2022).

Researchers highlight what can be counterproductive when gamification is applied inaccurately. Fuentes et al. (2020) proposed avoiding adopting a game without paying attention to its mechanics or execution. Regarding the way it is applied in the classroom or the chosen environment, there is a methodology that coincides with authors such as Buckley and Doyle (2017) and Gómez (2020). These are elements (18) commonly found in video games: achievements, narrative-theme context, avatars, budgets, final chiefs, collections, combat, unlucky content, gift systems, score tables, levels, points, challenges, social networks, teams, and virtual goods.

As an additional working method, the Octalysis model is explored by Chou (2019); he titles it gamification for all, as it can consider each of the exceptions or isolated cases that in other methods are usually generalized. In this, eight motivational cores are proposed, which are as follows: meaning and calling, development and achievement, creative power and feedback, belonging and possession, social influence and relationships, scarcity and impatience, unpredictability and curiosity, and loss and avoidance.

In other cases, games and playful activities are directly implemented in platforms such as Kahoot or Quizizz (Tejero, 2021), Genially (Balseca et al., 2022), or popular commercial video games such as Age of Empires (Buckley & Doyle, 2017).

3 | Method

3.1 Objectives and research questions

Based on the objective of this research, which was to identify the language learning experiences of students with different learning styles in a gamified learning environment, the research questions were: What are student learning styles? What were the language learning experiences of students with different learning styles in a gamified learning environment?

The research design of this study is a qualitative case study. A case study investigates and observes a single unit to understand larger ones. It is conducted at one point in time and within a defined period (Gerring, 2004). Qualitative research provides a broad view of behavior and attitudes (Creswell & Creswell, 2018); it is also characterized by using theory primarily to guide the research process. A scientific approach is achieved by systematically presenting the research transparently, thoroughly, and without bias through data collection and analysis (Monje, 2011).

3.2 Participants and context

The group considered for the study was at hand, so easy accessibility to participants was possible; therefore, the participants were chosen using nonprobability convenience sampling (Creswell, 2014). The participants were students majoring in administration in the semi-schooling modality and taking a summer course in English as a foreign language. They took six intensive classes lasting 5 hours each. The number of students in the class was 12, but three declined to be interviewed. For this reason, the sample consisted of 9 participants. The participants were primarily female ($n=7$) and male ($n=2$). The youngest participant was 19 years old, and the oldest was 32 years old. Some participants ($n=3$) presented a high preference for more than one LS and with high predominance identified the dependent style ($n=3$) and the visual style ($n=3$). The participants voluntarily signed an informed consent form with specifications about their collaboration in the empirical data collection stage. They agreed to participate in the semi-structured interviews on July 2, 2023.

During the course, the participants did activities that included oral and written text, audio files, images, individual and teamwork challenges, and simulation, and followed brief and clear instructions to do the activities. The activities had characteristics that considered Lozano et al.'s (2016) suggestions. The participants did the following activities: two dictations, a dialogue, a froggy jump, a word search, a memory game, a crossword puzzle, a column matching game, a text completion game, and a word

order game. The vocabulary used in the activities was selected based on the student's A2 language level and the language program. The activities were used to reinforce and verify the comprehension and learning of the topics covered and to promote the practice of grammar, reading and listening comprehension, oral production, vocabulary, and pronunciation. The grammar topics contained in the course were simple past, comparisons, present simple and continuous, vocabulary about movies, adjectives, and regular and irregular verbs. The links to the activities were shared in the WhatsApp group of the English II summer group. Participants felt comfortable in the classes, liked the activities, and mentioned that gamification allowed them to learn, practice, and learn from their peers. The most preferred games were froggy jumps, memory games, and dictation. See Table 1.

Table 1. General information of participants

Participant	Sex	Age	LS Predominance	They Feel	They Learned English	They Like the Games	The Most Useful Game
P1	Woman	24	Blended	Very well	Yes	Yes	Froggy jumps
P2	Man	26	Blended	Great	Yes	Yes	Froggy jumps
P3	Woman	20	Visual	Fine	Yes	Yes	All but the sentences
P4	Man	27	Dependent	Fine	Yes	Yes	Dictation
P5	Woman	22	Visual	Fine	Yes	Yes	Memory game
P6	Woman	19	Blended	Fine	Yes	Yes	Froggy jumps
P7	Woman	21	Visual	Fine	Yes	Yes	Froggy jumps
P8	Man	24	Dependent	Very well	Yes	Yes	Dictation
P9	Woman	32	Dependent	Fine	Yes	Yes	Memory game

3.3 Instruments and material

The Quiron Test, a 56-item Likert-scale questionnaire, was used to identify the participant LSs. It consists of four dimensions: preference in perception, level of autonomy, theoretical-practical orientation, and sensory preferences. In each dimension, two LSs are contemplated. The Quiron Test is reliable since its Cronbach's Alpha was 0.931 (Lozano et al., 2016). Also, a semi-structured interview was conducted to gather participants' language learning experiences when learning English in a

gamified environment. The interviews were recorded on a computer with the voice recorder application; their duration varied from 5 to 9 minutes.

3.4 Procedure

A large amount of information was collected in the semi-structured interviews, so it had to be coded into categories (Monje, 2011). This organization facilitated the analysis of the information and made it possible to verify that the research objective was met. The transcriptions of the recordings were compiled in a word processor so that they could be easily retrieved and used in the data analysis. Categories were obtained once the transcripts had been read several times and the researchers had been familiarized with the data; the data was reduced and codified. Borda et al. (2017) suggested a procedure for analyzing qualitative data. To begin with, the researchers inductively obtained the first list of codes on their own; they used the objective and research questions of the study to retrieve suitable evidence from the first interview. Second, the researchers met to compare the lists of codes they had obtained individually. They discussed the codes to be considered for analyzing the remaining interviews, so they prepared a second list of codes. Third, the second list of codes helped to analyze and code the data of the rest of the interviews. Fourth, the codes were revised, classified, and merged into three themes. Fifth, the extracts to be included in the results were organized in an Excel spreadsheet. Table 2 presents some themes and codes obtained in the analysis.

Table 2. Coding

Research question	Interview excerpt	Codes	Categories	Themes
What are the perceptions of students with different learning styles about the gamified learning experience for learning English?	«Theory makes me sleep and I usually don't pay attention, but in the case of this class, it is dynamic and allows me to be self-taught» (Participant 2).	Positive: learn understand participate entertain interest dynamic entertaining	Effects and qualities	Language learning experience
	«... the games they assigned helped me ... make... to write sentences» (Participant 6).	Language skill improved: Writing Grammar	FL abilities	Gamification and English language learning
	«Froggy jumps...I feel that it's not just like a game, but they help you memorize, to put into practice what you are learning» (Participant 5, visual).	Means to learn: Utility of the games	Achieved learning	Gamification and learning styles

4 | Results

4.1 Experiences when learning English in a gamified environment

The results indicate that the learning experiences in a gamified context were positive. The participants mentioned that the way they worked in class during the course allowed them to learn, understand, entertain, commit to learning, participate, and practice the foreign language (FL). Likewise, it is noted that the size of the group was a favorable aspect of the FL practice. The participants' responses showed that the language learning environment was attractive and interactive, generating the appropriate conditions and attitudes for learning the FL. In this regard, the participants expressed the following:

"The classes are dynamic, and my classmates help to make the classes very interactive and easy. In previous courses, the classes were more theoretical; at least in my personal type of learning, theory makes me sleep, and I tend not to pay attention, but in the case of this class, it is dynamic and allows me to be self-taught." (Participant 2)

"The classes were more didactic, which made me understand much more. It was a short course, but I tried to do everything." (Participant 7)

"At the beginning, I felt pressured because honestly, I am not very good at English, and I usually get bored with English classes, but in the end, I ended up being interested because I saw that I learned and that I could improve my English." (Participant 6)

"In the previous semester, I felt that the teacher did not teach anything, and in this one, I think that it was faster and more didactic; we practiced doing more exercises, and I learned more things because of the games and because the teacher made us participate and practice." (Participant 9)

"It also implies that the group is small. I have many opportunities to practice English with others. Also, the teacher explained in detail and corrected us." (Participant 3).

4.2 Gamification and English language learning

Gamification creates conducive learning experiences as learners think it allows them to develop different FL skills. Participants considered that they learned to construct sentences, speak, conjugate verbs, speak better, and memorize information during the course. They also mentioned that they modified their learning habits. Before this course, they used apps to

carry out written activities, but their use was reduced. Some participants felt they improved in the course:

"Learning verbs in their tenses and using them in complete sentences... Our teacher corrected us on pronunciation." (Participant 2)

"Speaking English better, and I stopped using the translator app to do the activities." (Participant 3)

"I feel that the games helped me when they had us participate or do the same sentences with that; I felt I could do them well. Now I try to stop using the translator; I look for a word but don't translate the whole text." (Participant 6)

"Yes, since I am more into activities like games than in theory. The games kept me entertained in the topic, and I learned how to make the comparisons or the construction of telling something." (Participant 7)

"Describing some actions that I'm doing. Now I already know that you must add 'ing' to the verb in present continuous." (Participant 8)

"I feel they are not like a game, but they help me learn because I can memorize vocabulary." (Participant 9).

4.3 Learning styles and gamification

Visual style

Participants perceived the activities as enriching and indicated they were helpful in learning. The most significant ones were froggy jumps, the memory game, and a particular case of lower satisfaction, which was mentioned in the sentence game due to a lack of understanding of the terms included in the game. Participants commented:

Froggy jumps... I feel that it is not just like a game, but they help you memorize vocabulary and put into practice what you are learning during class." (Participant 5)

"The games entertained me with the subject, and I learned how to make the comparisons." (Participant 7)

However, for one participant, a game was not well accepted due to its complexity; in this regard, the participant commented:

"The one I liked the least was the sentence-building activity because sometimes I did not understand what it said, but in the end, I got to practice." (Participant 3).

Dependent style

Concerning the dependent style, three students stated that their learning process was significantly enriched thanks to the interaction with both the teacher and their peers, highlighting the importance of the feedback received during the proposed gamified activities. One of the three students expressed:

"I feel that I learned with the classes; I talked it over with classmates; I feel that it helped us learn the most." (Participant 4)

This finding is consistent with observations made by Lozano et al. (2016), who noted that dependent students like to receive guidance in their studies and work in groups.

Participants also stated having learned English through gamification; they mentioned:

"The activities in which we can talk with our classmates as a team; I feel that it has reinforced speaking practice. We then tried to speak." (Participant 8)

"I feel that it is good this way; the teacher gave us examples and educational exercises." (Participant 4)

Another participant said that he liked how the course worked through gamification and liked "the games because they made us practice." (Participant 9).

Another participant said that he liked how the course worked through gamification and liked «the games because they made us practice» (Participant 9).

Blended style

Three students mentioned that their learning was enhanced thanks to the online tools in the classroom. Because of this, the students were able to expand their knowledge; this is what they said:

"I wish they implemented gamification in all classes to facilitate learning" (Participant 1).

"I learn through trial and error; then the mini games on the platform were just perfect; we learn to build complete sentences." (Participant 2)

"All the activities helped me. At the time of doing the games, at least I recognized the correct way to do them because in the game they tell you what was right or wrong, so I had fun doing it because, in the end, it was a game." (Participant 6).

5 | Conclusions and discussions

The participants evidenced the contribution of gamification in the language learning experience, which became positive for students. In this regard, Navarro-Sempere et al. (2022) present gamification as a teaching strategy because it increases student participation and interest during the practice of a subject and creates a positive learning environment that is more attractive and motivating. Likewise, a coincidence is observed in Rodríguez-Cajamarca et al. (2020), Huseinović (2023), and Boudadi and Gutiérrez-Colón (2020), who found high motivation in students to learn English when gamification is employed.

On the other hand, some cores of gamification were noticed in the language learning experience. The findings allowed for the observation of progress in English language skills. They showed that gamification was a crucial element in their motivation to learn. The findings unveiled four motivation cores achieved through gamification, which was proposed in Chou's (2019) model, emphasizing the meaning and calling section. This section suggests that individuals can be motivated to complete a task when they believe they can and are excited about the challenge. This evidence was demonstrated in the experiences of participants 6 and 7, who showed confidence in their English use.

Furthermore, the development and achievement core alludes to motivation to improve feelings of need to reach an objective and notice what was learned, as exemplified in the responses of participants 2 and 7. Moreover, aspects with creative power and feedback, which refer to receiving feedback on a task and reflecting on how they use their knowledge to reach the result, can be observed in the responses of Participant 2.

Moving to LSs and gamification in this study, the visual style has resulted in preference; in others, this style has also been pointed out as one of the preferable LSs (Bueno & Font, 2021; Ra & Indriani, 2020). Learning styles contribute to presenting activities that students feel comfortable doing. According to Lozano et al. (2016), collaborative activities with puzzles, problems, and cases are recommended to suit student LSs (Lozano et al., 2016). It is essential to remember that the learning styles were considered in the teaching proposal; Lóor and Alarcón (2021) express that teachers must apply methodologies adapted to the particularities of each LS to benefit learning outcomes. In addition, considering LSs in the games allowed participants to develop their intellectual capacities (García, 2017). These results enable teachers to distinguish an implication: to promote gamified activities since they can contribute to English learning.

When referring to Froggy jumps, Participant 9 considers that it allowed him to store information for later use and practice. He also clarifies that the important thing is that it is not only a game, which refers to Gaviria (2022) recommending that gamification should not be considered only as applying a game without a mechanic in mind; on the contrary, the game should contribute to the student's learning experience. In this sense, this finding is highlighted as favorable to the study.

The findings indicate that participants with a blended learning style found Froggy Jumps to be a helpful learning tool. Similarly, gamification has provided benefits in language learning in higher education, as it motivates students, encourages participation, increases attention, and influences behavior, leading to improvements in language skills (Huseinović, 2023).

Likewise, proper execution of games leads to learning. Implementing games can be challenging; as Buckley (2017) mentions, the objective is to establish challenges that students must meet. If the challenges are too difficult, it can generate aversion to the activity, but when completed successfully, it creates satisfaction. In the case of the participant, while the game of relating columns was one of the least preferable, the difficulty allowed for more practice of the topic.

Sometimes, when applying gamification, there is a risk that the mechanics used become distracting and prevent students from concentrating on the topic (Gaviria, 2022). However, gamification can maintain concentration and interest in the activities. This is a significant finding and a positive comment on the execution of gamification. These results align with previous research by Navarro-Sempere et al. (2022), who found that using Kahoot increased motivation during practice and improved recall of concepts covered in class. Likewise, Pitoyo and Asib (2020) indicate that gamification provides games that may be enjoyed in educational contexts.

This research found that the proposed games promoted collaborative work and strengthened English language skills in students with dependent learning styles. This corroborates the findings of Rodríguez-Cajamarca et al. (2020), who also reported that gamified strategies motivated students to acquire new language skills.

The research objective and questions were addressed based on the participants' empirical evidence. This research aimed to identify the perceptions of students with different LSs about their gamified learning experience in the development of English. Two research questions were addressed. The first one sought to identify student learning styles. The results indicated a predominance of visual, dependent, and blended

styles. This finding suggests that students prefer to learn with visual aids and under supervision and guidance. Generally, the students were satisfied with the implemented gamified activities. Therefore, gamification can meet students' needs and motivate them to learn the language. This research shows that gamified activities, when designed with consideration of student LSs, are productive and help improve different foreign language skills. They also helped modify certain classroom habits and attitudes towards the foreign language.

Furthermore, the preference for activities reveals that while one activity may be appropriate for some students, it may not be for others. This finding aligns with Alonso et al. (1997), who suggest that task acceptance or enjoyment may vary according to student LSs. This result has an academic implication: teachers should be informed about LSs and gamification, noting and considering student LSs. It is crucial to understand the differences among students to create suitable gamified learning experiences that effectively promote FL learning. Considering student LSs when selecting and preparing strategies benefits participants with different LSs (Sánchez-Cotrina, 2023).

On the other hand, the second research question inquired about the participants' learning experiences. The results revealed that the learning experience was positive since gamification provided beneficial aspects during the course, which helped develop FL skills despite the difficulties faced while learning English. The learning experience generated a positive attitude towards learning, motivated participants, kept students focused on tasks, and increased interest in FL development. This is consistent with the findings of Latorre and Marín (2023) and Rodríguez et al. (2020), which indicate that gamified activities helped achieve productive learning results and increased student satisfaction when completing challenging activities.

Overall, student feedback indicates that English learning was facilitated by the activities carried out in class, classmate attitudes, and interaction among students and between students and teachers. Since gamification engages students in learning, teachers should use it frequently in class to increase student satisfaction and motivation to learn English, especially in programs where English is not the primary field of study, such as in this case, where the major was administration. However, the implementation should be planned and organized, considering the level of English proficiency and student learning styles.

Limitations

This study was conducted with a small sample size, which limits the generalizability of the results. It could be replicated with a larger number of students in various contexts to validate these findings. Additionally, this study primarily represents visual and dependent learning styles. Including a sample that encompasses a broader range of learning styles would provide a more comprehensive interpretation of the LSs proposed in the Quiron Test. For future research, it is recommended to implement gamification across different subjects and academic levels. Furthermore, exploring the changes in students' study habits and attitudes toward FL learning before, during, and after the implementation of gamified activities would provide valuable insights.

6 | Acknowledgements

The authors extend their gratitude to the organizers of the Dolphin Program for promoting a passion for research among university students and facilitating collaborative work between researchers and students from both national and international institutions.

Author contributions

Conceptualization: A.B., R.I., R.N.; methodology: A.B., R.I., R.N., J.C.; validation: A.B., R.I., R.N., J.C.; formal analysis: R.D., G.G., D.G.; research: A.B., R.I., R.N., J.C.; resources: J.C.; data curation: R.D., G.G., D.G.; research: A.B., R.I., R.N., J.C.; data curatorship: A.B., R.I., R.N., J.C.; writing (original draft): A.B., R.I., R.N., J.C.; writing (proofreading and editing): A.B., R.I., R.N., J.C.; visualization: A.B., R.I., R.N., J.C.; supervision: J.C.; project administration: J.C.

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