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## **Gamificación en la enseñanza universitaria del inglés mediante un estudio de caso en Ecuador con enfoque en funcionalidades basadas en inteligencia artificial**

### **Gamification in University-Level English Language Teaching through a Case Study in Ecuador with a Focus on Artificial Intelligence-Based Functionalities**

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## Resumen

La investigación examina la incorporación de herramientas de gamificación en la enseñanza universitaria del inglés en Ecuador, por lo que su articulación con funcionalidades basadas en inteligencia artificial. El estudio parte de la necesidad de mejorar la motivación, participación y rendimiento estudiantil, especialmente en contextos donde el inglés no forma parte del eje disciplinar principal. La literatura revisada muestra avances significativos en el uso de gamificación e IA, pero también revela limitaciones metodológicas, falta de infraestructura y baja formación docente en el contexto ecuatoriano.

**Objetivo:** Analizar el impacto del uso de herramientas gamificadas con y sin funciones basadas en inteligencia artificial en el aprendizaje del inglés en estudiantes universitarios de carreras no lingüísticas, que incluye beneficios, desafíos y niveles de integración pedagógica.

**Metodología:** Se aplicó un enfoque mixto con diseño transversal. Participaron 108 estudiantes de tercer semestre de una institución pública ecuatoriana. La intervención duró ocho semanas e integró Kahoot, Quizizz, Wordwall y Duolingo for Schools. Se emplearon encuestas diagnósticas y finales, registros académicos, diario docente y rúbricas de evaluación. Los datos cuantitativos se procesaron mediante estadística descriptiva y los cualitativos mediante codificación temática.

**Resultados:** Se observó una mejora en vocabulario, comprensión lectora y uso del idioma, esta última la dimensión más fortalecida. Las herramientas con capacidades de IA, como Duolingo for Schools, mostraron mayor impacto debido a su aprendizaje adaptativo y retroalimentación automatizada. Sin embargo, su uso fue menor frente a herramientas más básicas, con lo que se destacó brechas institucionales y de capacitación. La distribución final de desempeño indica predominio de niveles “En desarrollo” y “Competente”, con avance moderado hacia niveles superiores. El estudio evidencia que la gamificación, cuando se integra de forma sistemática, favorece el aprendizaje del inglés, aunque aún existen desafíos relacionados con infraestructura, formación docente y alineación curricular.

**Palabras clave:** Gamificación educativa; Inglés como lengua extranjera (EFL); Inteligencia artificial en la educación; Sistemas de aprendizaje adaptativo; Enseñanza en la educación superior.



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## Abstract

The study examines the integration of gamified tools in university-level English language teaching in Ecuador, emphasizing their connection with artificial intelligence–based functionalities. It addresses the need to improve student motivation, participation, and academic performance, especially in non-linguistic programs. Prior literature shows positive outcomes of gamification and artificial intelligence (AI) in language learning but also highlights methodological limitations, insufficient infrastructure, and limited teacher training in the Ecuadorian context.

**Objective:** To analyze the impact of gamified tools with and without AI-driven features on English language learning among university students from non-linguistic majors, identifying benefits, challenges, and the level of pedagogical integration.

**Methodology:** A mixed-methods design with a cross-sectional approach was applied. The intervention lasted eight weeks and involved 108 third-semester students from a public university. The tools used included Kahoot, Quizizz, Wordwall, and Duolingo for Schools. Data were collected through diagnostic and final surveys, academic records, a teacher’s reflective journal, and formative rubrics. Quantitative data were analyzed using descriptive statistics, while qualitative data were examined through thematic coding.

**Results:** Improvements were observed across vocabulary, reading comprehension, and language use, with the latter showing the most significant progress. Tools with AI capabilities, such as Duolingo for Schools, had greater impact due to adaptive learning and automated feedback, although they were used less frequently than basic gamified tools reflecting institutional and training gaps. Overall performance distributions showed most students in the “Developing” and “Competent” levels, with moderate advancement toward higher proficiency. Findings indicate that systematic and contextualized gamification enhances English learning, although challenges remain regarding infrastructure, teacher preparation, and curricular alignment.

**Keywords:** Educational gamification; English as a foreign language (EFL); Artificial intelligence in education; Adaptive learning systems; Higher education teaching.



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## Introduction

In Ecuador, educational and digital challenges are reflected in recent indicators. According to the National Institute for Educational Evaluation (2024), only 29% of secondary education students reached the expected level in reading comprehension in a foreign language, revealing significant gaps in English language learning. Simultaneously, the Government's Digital Transformation Report (2023) indicates that only 34% of public institutions possess adequate technological infrastructure, and fewer than 20% offer formal training programs for educators in educational technologies. These limitations hinder the effective adoption of innovative strategies such as gamification and the integration of artificial intelligence in the classroom, particularly in regional universities facing budget constraints and connectivity inequalities.

In the context of contemporary higher education, English language instruction constitutes an essential component of academic curricula due to its transversal nature and its relevance in academic, scientific, and professional domains. However, despite its importance, university students, particularly those not enrolled in language programs, often show low levels of motivation, participation, and perceived applicability in the process of learning English as a foreign language. This situation has encouraged the search for more dynamic, inclusive, and student-centered instructional strategies.

In this regard, gamification, understood as the incorporation of game elements and mechanics into non-game contexts, has emerged as a promising tool to strengthen engagement, motivation, and knowledge retention across different educational levels. At present, many gamified tools integrate functionalities based on artificial intelligence. This integration improves the user experience and enables more precise personalization of learning, automated feedback, and predictive analysis of student performance (Chatzidaki et al., 2025).

In the specific field of language teaching, several studies indicate that the use of gamified platforms enhances academic performance and increases interest in autonomous and collaborative learning by transforming routine tasks into interactive and meaningful learning experiences.

This article presents a case study conducted at a public university in Ecuador. Its objective is to analyze the impact of using gamification tools such as Kahoot, Quizizz, Duolingo for Schools, and Wordwall in English course aimed at university students enrolled in non-linguistic programs. Through a mixed-methods approach, the study examines student perceptions, academic results, and challenges identified during implementation in order to provide empirical evidence supporting the integration of innovative approaches in English language teaching in higher education.



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Despite the growing body of international literature that supports the combined use of gamification and artificial intelligence in language teaching, empirical studies that evaluate this integration in university contexts in Latin America, and particularly in Ecuador, remain limited, fragmented, or predominantly descriptive (Ahma & Kadriu, 2025).

The study seeks to address the need to transform traditional teaching practices through the strategic use of educational technologies, generating practical recommendations for curriculum design, pedagogical management, and the continuous improvement of foreign language teaching programs in Latin American university contexts.

## Literature Review

Over the past decade, gamification in education has gained relevance as a strategy to improve motivation, engagement, and learning outcomes, particularly in the teaching of foreign languages (EFL/TEFL) at the higher education level. Simultaneously, the use of technological tools in competency-based assessment has continued to expand (Gómez-Chabla et al., 2017).

International authors such as Zolfaghari et al. (2025) have reviewed gamified applications in English language teaching, reporting improvements in student engagement, intrinsic motivation, and receptive and productive language skills. However, other researchers point out that the effectiveness of these tools depends on the quality of game design elements, the duration of the intervention, and the students' prior familiarity with educational technologies.

In the Latin American context, studies remain scarce and have generally focused on vocabulary acquisition or motivational aspects, without clearly incorporating robust artificial intelligence (AI) functionalities (studies from Peru and Brazil). The lack of rigorous longitudinal or experimental studies in the region further limits the generalizability of the promising results observed internationally.

An emerging dimension is the integration of AI-based functionalities into gamified tools. According to Torres-Toukoumidis, Fernández-Jiménez, Merchán-Romero y Vega-Ramírez (2025), literature that explores the convergence between gamification and AI highlights technologies such as natural language processing (NLP), adaptive algorithms, computer vision, personalized recommendations, and automated feedback systems. These authors argue that, in most cases, such technologies improve feedback mechanisms, adjust task difficulty to the



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student's level, and optimize academic performance particularly in higher education. Nonetheless, critics including some Latin American scholars warn that these functionalities require technological infrastructure, stable internet connectivity, specialized teacher training, and clear data privacy policies, which are not universally present in countries like Ecuador. As a result, a gap emerges between the theoretical potential of AI and its practical feasibility.

In Ecuador specifically, available studies show interest in and qualitative exploration of AI integration into English language education, but with notable methodological limitations. For example, Ayala-Pazmiño y Alvarado-Lucas (2023) examined teachers' perceptions in Quito regarding AI use in English instruction. They identified personalized learning and objective feedback as key perceived benefits, while highlighting obstacles such as insufficient infrastructure, lack of teacher training, and concerns about data privacy. However, this study did not implement any gamified tools with actual AI functionalities, nor did it compare experimental and control groups. In contrast, Tejada-Castro et al. (2018) conducted a quasi-experimental study in Guayaquil, Ecuador, comparing control and experimental groups using digital gamification. Their results showed statistical improvements in the experimental group's competencies, but the study did not involve AI-driven features such as adaptive learning or speech recognition. This contrast reveals that while traditional gamified methods have been applied in Ecuador, robust AI integration remains largely absent.

At the international level, recent reviews offer combined evidence of positive outcomes but also highlight persistent risks and challenges. The study "Gamification and Artificial Intelligence in the Educational Context: Analysis of Scientific Literature" by Torres-Toukoumidis et al. (2025) reports that most AI-based gamification efforts are concentrated in secondary and higher education settings. However, the literature still shows limited diversity in learner profiles, with few studies focusing on non-linguistic university students, and little long-term evaluation beyond isolated interventions. Moreover, although gamification improves motivation and academic performance, some authors caution that these benefits may be temporary or diminish without sustained curricular integration, institutional support, and regular updates of the technologies involved.

In summary, the state of the art demonstrates a growing international body of empirical research supporting the effectiveness of combining gamification and AI in English language teaching, with significant improvements in motivation, performance, and personalized learning (Briones Zambrano, 2025). However, in the Ecuadorian context, critical methodological gaps remain. These include the absence of case studies involving gamification with AI functionalities in higher education, a lack of interventions incorporating voice recognition, adaptive NLP, or intelligent



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feedback, no control group comparisons, and persistent institutional limitations such as inadequate infrastructure and insufficient teacher training.

## **Materials and Methods**

This study follows a mixed-methods approach aimed at gaining an in-depth understanding of how gamified tools influence the teaching and learning process of English in Ecuadorian university settings. It is classified as a cross-sectional study, as data collection was carried out during a single academic term. This temporal delimitation is appropriate for assessing the immediate effects of the gamified intervention on academic performance and student perceptions. The use of an instrumental case study design responds to the need to observe specific educational phenomena in real classroom conditions, considering both the uniqueness of the context and its potential to generate transferable insights.

The selected case involved a public university in Ecuador, where an eight-week instructional intervention was implemented in a compulsory English course for students in non-linguistic degree programs. The sample consisted of 108 third-semester students from a technological program, selected through non-probability convenience sampling.

All participants held an A1 level according to the Common European Framework of Reference for Languages (CEFR). Additionally, a teacher with specialized training in language pedagogy and educational technologies was responsible for designing and delivering the gamified strategies.

### **Educational Context and Study Relevance**

The relevance of this research lies in the urgent need to improve both the quality and the curricular pertinence of higher education in Ecuador, particularly in foreign language learning. According to data from the National Institute for Educational Evaluation (2024), persistent gaps in communicative competence in English continue to limit academic and professional opportunities for students, especially those enrolled in technical and technological programs. Furthermore, low levels of student motivation have been identified as a primary cause of dropout and underperformance in language courses.

In this context, gamification emerges as a methodological strategy with potential to enhance student engagement in the learning process by introducing playful, interactive, and digitally adapted dynamics. This study is thus proposed as a research-based response to the need for



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innovation in English language teaching, addressing both pedagogical effectiveness and curricular equity and relevance.

### **Gamified Tools and Intervention Phase**

During the intervention period, the following digital tools were used systematically for pedagogical purposes:

**Table 1. Gamified Tools Used in the Intervention**

<b>Tool</b>	<b>Primary Function</b>
<b>Kahoot!</b>	Live interactive quizzes on vocabulary and grammar
<b>Quizizz</b>	Asynchronous review with automated feedback
<b>Wordwall</b>	Interactive activities for matching, crosswords, and classification
<b>Duolingo for Schools</b>	Voluntary extracurricular practice and progress tracking

Each tool was used at least once per week over the course of the eight-week intervention.

### **Procedure**

The research process was organized into three phases:

Phase 1 – Diagnosis and Planning (Week 1): An initial survey was applied to assess prior attitudes and experiences related to educational technologies. This was followed by the didactic planning of gamified activities aligned with the course objectives.

Phase 2 – Instructional Intervention (Weeks 2 - 8): Systematic implementation of gamified activities took place during both in-person and virtual sessions, in combination with traditional methodologies.

Phase 3 – Evaluation and Closure (Week 8): A final perception survey was administered, along with an analysis of the teacher’s reflective journal and the collection of academic records to compare pre- and post-intervention performance.

### **Data Collection Instruments**

Five instruments were used to gather both objective and subjective data on the phenomenon under study:

**Initial Diagnostic Survey:** Assessed prior knowledge, motivation, and previous use of educational technologies.

**Academic Performance Records:** Included scores from written tests, tasks, and practical activities.



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Final Perception Survey: Consisted of Likert-type items (1 to 5) evaluating motivation, participation, and perceived usefulness.

Teacher's Reflective Journal: Documented systematic observations on student performance, methodological adjustments, and classroom climate.

Formative Assessment Rubric: Assessed the execution of gamified activities in terms of vocabulary, reading comprehension, and language use.

### **Data Analysis**

The statistical analysis focused on the evolution of academic performance and student perceptions related to the use of gamified tools. Quantitative data were processed using descriptive statistics, calculating means, standard deviations, and percentage variations before and after the intervention. These analyses revealed significant increases in average scores and a reduction in score dispersion, suggesting improved consistency in learning outcomes (Aguirre-Munizaga, 2025).

Simultaneously, qualitative data were examined using inductive thematic coding, which made it possible to identify recurring patterns in students' learning experiences, such as increased engagement, perceived autonomy, and appreciation of immediate feedback.

### **Ethical Considerations**

The study adhered to the ethical principles governing research involving human subjects, in accordance with national and institutional standards. All participants voluntarily signed an informed consent form that guaranteed the confidentiality, anonymity, and academic use of the collected data. The research process ensured the protection of participants' dignity, privacy, and autonomy throughout all phases of the study.

This research complies with the ethical and legal framework established in Ecuador, particularly with the provisions of the Organic Law on Higher Education and its regulations, which require that all academic research involving human subjects be conducted under principles of transparency, respect, and responsibility. Furthermore, the study aligns with Article 66 of the Constitution of the Republic of Ecuador, which guarantees the right to personal data protection, privacy, and informed participation in any activity involving personal information.



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## Results

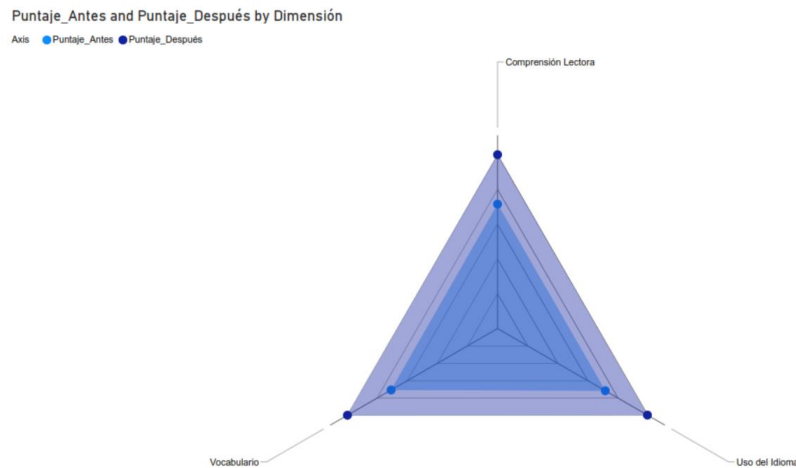
The results analysis begins by highlighting the set of gamified tools used in the intervention, with particular emphasis on the presence or absence of artificial intelligence (AI) functionalities, as summarized in Table 2.

**Table 2. AI-Based Functionalities in Gamified Tools Used During the Intervention**

Tool	AI Integration	Type of Functionality	AI Level of Pedagogical Integration	of Relevant Observations
Kahoot!	No	Basic analytics	Low	Focused on live quizzes. Some add-ons provide basic analytics, but the platform does not adapt content or deliver intelligent feedback.
Quizizz	Partial	Automated feedback; basic analytics	Medium	Offers performance reports and instant responses but lacks adaptive algorithms and predictive modeling.
Wordwall	No	N/A	Low	A static tool for designing interactive games, without student-level adaptation or explicit AI functions.
Duolingo for Schools	Yes	Adaptive learning; error processing; personalized tracking	High	Adjusts difficulty based on user performance; provides individualized progress tracking and contextualized feedback through machine learning algorithms.

### Comparative Analysis of Learning Dimensions

Figure 1 displays a radar chart comparing students' average scores before and after the intervention across three key learning dimensions in English: vocabulary, reading comprehension, and language use. This visualization highlights the performance variations in each evaluated criterion.

**Figure 1. Pedagogical Effectiveness of the Intervention**

Overall, there was sustained improvement in all three dimensions following the implementation of gamified strategies (Briones Zambrano, 2023). The language use dimension showed the greatest increase between pre- and post-intervention scores, suggesting a significant impact on students' functional ability to apply English in communicative contexts. This result may be attributed to the use of interactive tools such as Duolingo for Schools and Wordwall, which promote continuous, contextualized language practice.

Vocabulary also improved moderately, likely due to quiz-based activities using tools such as Kahoot! and Quizizz, which support lexical recognition and memorization. Reading comprehension scores increased as well, though to a lesser extent. This may indicate the need to integrate gamified strategies that better support critical and reflective reading.

These findings are consistent with previous studies emphasizing the role of gamification in increasing student motivation, participation, and academic engagement, particularly in settings where communicative language skills are central (Rivera & Garden, 2021).

The radar chart effectively illustrates how the systematic and well-planned use of gamified tools not only enhances academic performance but also diversifies the competencies developed.

### **Distribution of Performance Levels by Learning Criterion**

Figure 2 shows the percentage distribution of students across different performance levels (Beginning, Developing, Competent, and Advanced), based on a formative rubric applied to three learning criteria: Vocabulary, Reading Comprehension, and Language Use. The stacked bar chart offers a clear profile of student achievement at the conclusion of the intervention.

**Figure 2. Performance Levels**

Source: Authors

The data reveal that the majority of students fall within the Developing and Competent levels, indicating generally positive performance with room for growth. The Language Use dimension stands out, with the highest percentage of students classified as Competent (38.89%), followed by Vocabulary (37.04%) and Reading Comprehension (34.26%).

This trend suggests that the intervention particularly benefited the development of students' ability to apply English in real communicative contexts—likely associated with frequent use of Duolingo for Schools and Wordwall, both of which encourage functional and contextualized language use.

In contrast, Vocabulary shows the lowest percentage of students at the Advanced level (12.04%) and the highest at the Beginning level (17.59%), highlighting the need to reinforce gamified strategies that target lexical enrichment. Such reinforcement could include discovery-based activities rather than mechanical repetition. Reading Comprehension presented a more balanced distribution, with 19.44% of students in the Advanced level and only 15.74% in the Beginning level.

The notable presence of students in the Developing category across all three dimensions (approximately 30% in each case) reflects an ongoing learning process toward the consolidation of competencies. This validates the formative focus of the study and underlines the importance of continuing to apply active methodologies to reinforce educational attainment.



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Taken together, these findings confirm that when integrated systematically and contextually, gamification not only motivates but also strengthens the development of specific English language skills in university contexts (Chifla Villón, 2024).

### **Analysis of Gamified Tool Usage in University-Level English Sessions**

The final analysis is based on the distribution of session usage by tool. The graph indicates that Kahoot! accounted for the highest proportion of sessions (29.41%), mainly used for live quizzes. This mode encourages immediate participation, friendly competition, and real-time feedback. These findings align with studies such as Taesotikul et al. (2021), which emphasize Kahoot!'s ability to increase attention and engagement, though they also highlight limitations in fostering productive language skills when not combined with broader instructional strategies.

Wordwall was the second most used tool (26.47%), primarily employed in matching and classification activities. It has proven effective in reinforcing vocabulary and grammar, particularly at basic proficiency levels, thanks to its visual and interactive design. However, its contribution to the development of higher-order communicative skills (e.g., oral production, argumentation, interaction) supports the view that such platforms require deeper instructional design to have a lasting impact in university contexts (Yan & Moorhouse, 2023).

Quizizz ranked third, with 23.53% of session usage, typically applied in asynchronous review activities. Unlike Kahoot!, Quizizz allows students to work at their own pace, which is advantageous in settings with limited connectivity or hybrid modalities, as found in several public Ecuadorian universities. While it offers basic gamification features (scores, time, rewards), its standard version lacks AI-driven customization, which limits its alignment with intelligent learning environments.

In contrast, Duolingo for Schools, used in 20.59% of sessions, does incorporate machine learning models that adapt content based on user performance. Its relatively lower usage may reflect limited teacher familiarity with the platform or institutional curricular restrictions.

From a critical perspective, this distribution reveals two key trends. First, there is a clear preference for tools focused on immediate reinforcement and objective assessment, reflecting a learning control paradigm rather than one aimed at developing integrated communicative competencies. Second, tools with embedded AI functionalities are less frequently used,



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highlighting the gap between the potential of available technologies and their effective integration into classroom practice (Aguirre-Munizaga et al., 2022).

This gap may be attributed to structural challenges already documented in Ecuadorian higher education, including limited teacher training in educational technologies, infrastructural deficiencies, institutional resistance to methodological change, and the absence of systematic innovation policies (Ayala-Pazmiño, 2023).

These empirical findings underscore the need to expand case studies such as the one presented here, with the aim of assessing not only the frequency of gamified tool usage but also their actual impact on the acquisition of English language competencies and the degree to which they incorporate adaptive or intelligent AI-based functionalities. Moreover, these findings invite a critical reflection on the educational relevance of such strategies when they are not aligned with clearly defined learning objectives or coherent assessment systems, conditions that may ultimately compromise the quality of education in university programs tasked with preparing professionals who require instrumental English proficiency in a globalized environment.

## Discussion

The results of this study reveal substantial improvements in students' academic performance across the three assessed dimensions: language use, vocabulary, and reading comprehension. These findings support the theoretical foundations of gamification as a driver of engagement and active learning and reinforce the assumption that game-based dynamics can enhance intrinsic motivation in university contexts (Marengo et al., 2025). Notably, the use of tools such as Duolingo for Schools which incorporates adaptive learning features based on artificial intelligence had a positive effect on the development of functional language skills, as also suggested by Briones Zambrano (2025).

However, the improvements observed were not uniform. The least pronounced progress was seen in the reading comprehension dimension, suggesting that the gamified strategies applied were more effective for mechanical practice than for fostering critical and analytical competencies. This finding aligns with observations by Yan y Moorhouse (2023), who caution that without deep instructional design, many gamified tools tend to reinforce lower-order cognitive skills.

The results are consistent with international studies such as those by Zolfaghari et al. ADDIN ZOTERO\_ITEM CSL\_CITATION {"citationID":"v6c6wyBR","properties":{"formattedCitation":"(Facuy, 2025)","plainCitation":"(Facuy,



2025)","noteIndex":0},"citationItems":[{"id":1418,"uris":["http://zotero.org/users/5555758/items/BZNV8BI"],"itemData":{"id":1418,"type":"article-journal","abstract":"La formulación y valoración de proyectos juega un papel crucial en la puesta en marcha de los Sistemas de Información Gerencial (SIG). La planificación apropiada de estos proyectos facilita la maximización de recursos, la congruencia con los objetivos organizacionales y la optimización en el proceso de toma de decisiones. Este estudio examina la relevancia de la concepción de proyectos en Sistemas de Información Gerencial (SIG), junto con los criterios fundamentales para su evaluación, subrayando su influencia en la eficiencia y competitividad corporativa. Se exploran casos prácticos, metodologías aplicadas y beneficios estratégicos derivados de una correcta planificación y evaluación de estos sistemas. Asimismo, se presentan los principales retos y oportunidades que enfrentan las empresas en la implementación de SIG, con el fin de proporcionar una visión integral sobre la relevancia de estos procesos en la gestión corporativa."},"container-title":"Nexus Research Journal","DOI":"10.62943/nrj.v4n1.2025.212","ISSN":"3028-8827","issue":"1","journalAbbreviation":"NRJ","license":"https://creativecommons.org/licenses/by/4.0","source":"DOI.org (Crossref)","title":"Importancia de la Formulación y Evaluación de Proyectos en los Sistemas de Información Gerencial","URL":"https://editorialnova.com/index.php/nrj/article/view/212","volume":"4","author":{"family":"Facuy","given":"Jussen"},"accessed":{"date-parts":["2025",10,17]},"issued":{"date-parts":["2025",2,21]},"schema":"https://github.com/citation-style-language/schema/raw/master/csl-citation.json"} (Facuy, 2025)(2025), who affirm that gamification can significantly enhance student engagement and performance in language-related skills. They also align with the conclusions of Rivera y Garden (2021), who propose that gamification strengthens the connection between students and content, provided that the activities are clearly aligned with pedagogical objectives.

Within the Latin American context, the present study is notable for its combined focus on gamification and artificial intelligence an approach rarely documented in previous research. Ecuadorian studies, such as those conducted by Tejada-Castro et al. (2018) have reported benefits from the use of gamification in university settings, but without incorporating tools that offer adaptive or intelligent capabilities. Therefore, the study discussed here contributes new value to regional literature by empirically documenting the joint application of gamification and AI in university-level English instruction under real classroom conditions.



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In contrast, the limited use of AI-powered tools observed in the session analysis particularly the minimal use of Duolingo suggests that institutional and pedagogical barriers to the full adoption of advanced educational technologies remain. This supports the conclusions of Ayala-Pazmiño (2023), who identified limited teacher training, unequal infrastructure, and institutional resistance to nontraditional pedagogical models as the main obstacles.

## Conclusions

From the perspective of educational policy, the findings of this study confirm the importance of integrating intelligent gamification as a transversal instructional strategy within foreign language programs. This is especially relevant in non-linguistic fields, where student motivation remains low. Addressing this need involves more than revising teaching practices; it also requires curricular updates that incorporate emerging technologies as mandatory components of academic programs, as proposed by post-pandemic reforms in several university systems (Chifla Villón, 2024)

In the context of university–society engagement, strengthening communicative competence in English through adaptive gamified environments contributes to improved employability and academic mobility. This connection between pedagogical innovation and formative relevance is particularly significant in Ecuador, where, according to the National Institute for Educational Evaluation (2024), considerable gaps in English proficiency persist, especially in technological and regional universities.

Although the study yields positive results, it also exposes an ongoing disparity between the availability of educational technologies and the institutional capacity to implement them pedagogically. The preference for tools with basic mechanics, such as Kahoot! and Wordwall, over those with integrated artificial intelligence, such as Duolingo for Schools, indicates that innovation does not always progress in step with instructional competencies or institutional frameworks.

This misalignment may affect educational quality. The use of gamified platforms without proper curricular integration or without fully utilizing their adaptive features may result in a superficial learning experience, lacking meaningful transformation of teaching and learning processes (Torres-Toukoumidis et al., 2025). Furthermore, the absence of assessment systems aligned with these environments limits both learning traceability and the capacity to deliver personalized feedback, which are essential in the current landscape of higher education.



At the institutional level, these findings point to the urgent need to strengthen ongoing teacher training in the pedagogical use of emerging technologies, to establish consistent innovation policies in education, and to design strategies that ensure scalability and the possibility of implementing similar interventions in other programs and academic contexts.

It is necessary for higher education institutions to develop specific ethical, pedagogical, and curricular guidelines for the effective integration of artificial intelligence-based tools, in order to ensure that their adoption responds to sound pedagogical principles rather than to technological trends alone.





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