Technological Strategies For Gamification In Teaching

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Abstract
Gamification has been recognized as an innovative educational strategy, designed to increase student motivation and engagement. This article provides a comprehensive examination of the technological tools employed in gamification and their impact on learning, with a particular focus on the utilization of digital tools to cultivate essential competencies in students. A comprehensive review of ten recent articles from scientific journals indexed in Scielo, SCOPUS, and Google Scholar was conducted, which revealed a positive impact of game-based learning, particularly in enhancing motivation and academic skills. The necessity of incorporating gamification as a dynamic methodology that overcomes the limitations of traditional approaches is underscored. Furthermore, the necessity of incorporating gamification into the curriculum is underscored, offering a dynamic and engaging approach that diverges from conventional pedagogical methods. The integration of technologies in education has been demonstrated to foster the development of digital skills, promote greater collaboration between students and teachers, facilitate more flexible and personalized learning, and reduce the digital divide. Collectively, these tools have the potential to transform the classroom, fostering an inclusive and participatory educational environment that is committed to the comprehensive education of students.
Keywords: gamification, ICT tools, new technologies, and digital platforms such as Kahoot, Cerebriti, Class Dojo, and Quizizz.

Resumen
La gamificación se ha establecido como una estrategia educativa innovadora, diseñada para aumentar la motivación y el compromiso de los estudiantes. Este artículo examina de forma detallada las herramientas tecnológicas implementadas en la gamificación y su influencia en el aprendizaje, con énfasis en el uso de herramientas digitales para desarrollar competencias esenciales en los estudiantes. Tras revisar 10 artículos recientes de revistas científicas indexadas en Scielo, SCOPUS y Google Scholar, se destaca el impacto positivo del aprendizaje basado en juegos, especialmente en la mejora de la motivación y habilidades académicas. Se subraya la relevancia de integrar la gamificación como una metodología dinámica que supera las limitaciones de los enfoques tradicionales. Además, se enfatiza la importancia de integrar la gamificación en el currículo , proporcionando un enfoque dinámico y atractivo que rompe con los métodos pedagógicos tradicionales. Esta integración de tecnologías en la educación no solo fomenta el desarrollo de competencias digitales, sino que también promueve una mayor colaboración entre estudiantes y docentes, facilita un aprendizaje más flexible y personalizado, y ayuda a reducir la brecha digital. En conjunto, estas herramientas transforman el aula,

generando un entorno educativo más inclusivo, participativo y comprometido con la formación integral de los estudiantes.
Palabras clave: enseñanza gamificada, ludificación, herramientas TIC, nuevas tecnologías, Kahoot, Cerebriti, Class Dojo, Quizizz.

Resumo
A gamificação se consolidou como uma estratégia educacional inovadora, voltada para aumentar a motivação e o engajamento dos estudantes. Este artigo analisa detalhadamente as ferramentas tecnológicas implementadas na gamificação e sua influência no aprendizado, com ênfase no uso de ferramentas digitais para desenvolver competências essenciais nos estudantes. Após revisar 10 artigos recentes de periódicos científicos indexados no Scielo, SCOPUS e Google Scholar, destaca-se o impacto positivo da aprendizagem baseada em jogos, especialmente na melhoria da motivação e das habilidades acadêmicas. Sublinha-se a relevância de integrar a gamificação ao currículo, proporcionando uma abordagem dinâmica e envolvente que supera as limitações dos métodos pedagógicos tradicionais. Além disso, a integração dessas tecnologias na educação favorece o desenvolvimento de competências digitais, promove maior colaboração entre alunos e professores, facilita um aprendizado mais flexível e personalizado e ajuda a reduzir a exclusão digital. Juntas, essas ferramentas transformam a sala de aula, criando um ambiente educacional mais inclusivo, participativo e comprometido com a formação integral dos estudantes.Keywords: gamified teaching, gamification, ICT tools, new technologies, Kahoot, Cerebriti, Class Dojo, Quizizz.
Palavras-chave: ensino gamificado, gamificação, ferramentas TIC, novas tecnologias, Kahoot, Cerebriti, Class Dojo, Quizizz.

INTRODUCTION

Information and Communication Technologies (ICTs) have engendered a profound societal transformation, permeating all spheres and sectors. This transformation has led to the emergence of the Information and Knowledge Society. This paradigm shift has been identified by some researchers as marking the conclusion of the industrial era and the commencement of the digital era (Barroso et al., 2007). Moreover, a transition to a fourth industrial revolution is imminent, in which citizens will be required to acquire digital skills (Williamson et al., 2019; Cedefop, 2019). Johnson et al. (2015) posit the significance of technological applications and future and emerging technologies (FET), which engender novel social and scientific challenges. As emphasized by Area and González (2015), educational institutions must undergo a transformation in their teaching materials and methodologies to adapt to the evolving demands of the teaching-learning process.

In light of the mounting significance of digital competencies, numerous organizations and institutions are undertaking a comprehensive re-examination of the education system, assimilating digital skills as an integral component of all domains of learning (European Commission, 2022; INTEF, 2017; OECD, 2005; UNESCO, 2011). The advent of the pandemic precipitated the swift integration of digital technologies into educational practices, propelling networked learning through the utilization of diverse technological tools. This paradigm shift challenged the conventional characteristics of education, namely the unity of time, space, and action (Arruti et al., 2020; Council of the European Union, 2020; Ramírez-Montoya, 2020).

Consequently, ICTs represent a paradigm shift in the realm of traditional education, as they facilitate the implementation of innovative pedagogical practices across diverse educational settings and at all levels (Salinas, 2008). Yang and Kwok's (2017) study similarly underscores the efficacy of Information and Communication Technologies (ICT) in enhancing teaching

and learning processes for both educators and students. Salinas (2008) posits that educators experience a substantial transformation in their role when they assume the roles of facilitators and guides of the learning process. Consequently, the role of the teacher is not the sole entity that undergoes a transformation; students assume a more active role in their teaching process, thereby increasing their autonomy (Salinas, 2008).

In this vein of educational innovation, gamification emerges as a means of entering the domain of Information and Communication Technologies (ICT) within the school environment. According to Chacón (2008), play functions as an appealing and compelling element that captures students' attention, regardless of the subject matter being studied. In this sense, it is postulated that learning is favored when the playful component and practical experience are intrinsically integrated into the educational process. Gamification, a concept that integrates the benefits of games with the possibilities offered by new technologies, has emerged as a significant element in the contemporary educational landscape.

The term "gamification" or "gamification," which is of recent origin and not yet recorded in the Dictionary of the Royal Spanish Academy, is derived from the Anglo-Saxon word "gamification" (game). According to the definition proposed by Kapp (2012), gamification involves the use of mechanisms and elements of games to attract people's participation, motivate their action, promote learning, and promote problem solving. In essence, gamification refers to the incorporation of activities or applications that simulate the dynamics of a game, but are intrinsically oriented towards the achievement of learning objectives.

Accordingly, Cook (2013) establishes three fundamental premises for an activity to be considered a game: the ability to be learned, the possibility of evaluating the participant's performance, and the feasibility of providing feedback to the user. In essence, gamification entails the adaptation of game-specific methodologies and mechanics to non-gaming contexts, with the objective of tackling tangible issues. This underscores the significance of investigating the potential of technological strategies to enhance the implementation of gamification in teaching, emphasizing the necessity of identifying enriching tools that facilitate effective integration of gamification with ICT in the educational context. Consequently, a thorough examination was conducted to enhance comprehension of the impact and potential of this combination in enhancing the learning process.

METHOD

The present research adopts a methodological approach of qualitative analysis through a bibliographic review, based on the guidelines established by Piantanida and Garman (1999) as well as by Savin-Baden and Major (2013). The primary objective of this study is to examine the positive effects derived from the implementation of gamification technology strategies in educational environments, with a particular focus on the use of platforms such as Kahoot! and Quizizz for the development of digital citizenship skills.

The documents selected for analysis and subsequent review were obtained from scientific journals that are indexed in recognized databases, including Scielo, SCOPUS, and Google Scholar. These databases are widely regarded as reliable sources of high-impact academic articles. The selection criteria are consistent with the PRISMA guidelines established by the University of York in 2015. These criteria were established in accordance with the following parameters:

- **Time range:** Publications made in the last five years (2019-2024) were considered to capture the recent evolution of gamification on platforms such as Kahoot! and Quizizz in the educational context.
- **Relevance:** Priority was given to content directly linked to the context of digital citizenship in education.

- **Language:** Articles published in English or Spanish were included.
- **Access:** Open access articles were favored to ensure the availability of information.

In the context of this research, specific descriptors combined with Boolean operators were adopted to carry out an exhaustive search on technological strategies for gamification in teaching. The present search methodology centered on instruments that facilitate the implementation of gamified methodologies in educational environments. The search was initiated with the term "Kahoot!," which was linked by the operator "Y" with "gamification." This approach facilitates access to a comprehensive array of studies that analyze the use of Kahoot! This approach fosters an interactive and dynamic learning environment, thereby facilitating the active participation and motivation of students through the implementation of quizzes and educational games.

Furthermore, the term "Quizizz" was incorporated using the operator "OR." This broadens the scope of the search to incorporate documents that examine the application of this tool within the framework of gamification in teaching. Quizizz offers an environment that is conducive to healthy competition and autonomous learning, allowing students to review course material in an engaging and participatory way.

Furthermore, the terms "gamification" and "ICT" (information and communication technologies) were utilized to ascertain that the selected articles address a comprehensive approach to the use of these technological tools in the educational field. This methodological approach seeks not only to identify specific strategies, but also to evaluate the impact of these tools on learning and the development of digital skills, as well as on improving students' academic performance.

In summary, the selection of articles is based on rigorous criteria that guarantee the quality and relevance of the documents, providing a solid basis for the analysis of technological strategies that facilitate gamification in teaching. The objective of this research is to enhance the comprehension of the effective utilization of gamification platforms in the context of enhancing the educational process and fostering meaningful learning.

RESULTS

After applying the corresponding filters, the following table is presented with the articles that will be submitted for analysis:

Table 1 List of articles on technologies for gamification in teaching

	Author/year	**Title**	**Magazine**
1	Pertegal and Lorenzo (2019)	Gamification in the classroom through ICT	Dialnet
2	Guevara et al. (2023)	Gamification for the development of learning mathematical operations in third grade.	Scielo
3	Ormazábal et al (2023)	Play as a learning tool in higher education	Scielo
4	García et al. (2023)	Gamification and ubiquitous learning in higher education: Applying learning styles	Scielo

5	Cuba and Pérez (2021)	Application of gamification in the design of activities in distance education.	Scielo
6	Mirkka et al. (2023)	Kahoot! Accessibility and Quizizz: Using Educational Games with Older Students	Scopus
7	Fabre (2023)	Kahoot and Quizizz: When Playing in Teams Makes a Difference in Motivating People to Read Science News	Dialnet
8	Pellas (2024)	Efectividad de Kahoot! in K-12 Student Math Achievement	Scopus
9	Katemba et al. (2022)	Do Kahoot! vocabulary learning?	
10	Garza et al. (2023)	Performance in Kahoot! as a predictor of performance in exams.	Scopus

A review of ten recent articles addressing gamification in education reveals a diversity of approaches and results obtained in different academic contexts. The review also highlights the similarities and differences in their conclusions on the effectiveness of these methodologies. The objective of this analysis is twofold: first, to provide a concise summary of the findings, and second, to facilitate a comparative analysis and a thoughtful reflection on the implications of gamification on learning.

Initially, Fabre's (2023) study examined the utilization of educational platforms such as Kahoot and Quizizz in fostering the engagement of students in reading science news. The findings indicate that group participation in Kahoot has a substantial impact on both reading comprehension and performance in knowledge assessments. These results align with previous research, including that of Pergal and Lorenzo (2019), who documented an increase in students' motivation and attention in master classes. In their study, 82% of students reported increased participation and interest in classes using Kahoot. Conversely, Ormazabal et al. (2023) have expanded upon this perspective by analyzing the impact of various gaming platforms, including Kahoot and analogous tools, on university students. Their findings suggest that the incorporation of diverse gaming platforms can enhance student grades and motivation, thereby indicating that the provision of varied gamified tools has the potential to augment learning outcomes. This finding aligns with the research of Guevara et al. (2023), who implemented the educational game Calesca Mat to improve the mathematical skills of third-grade students of basic education, observing a significant increase in student motivation and interest. This pattern suggests that gamification, when adapted to different curricular content, can offer an effective framework for improving the educational experience. However, as Fabre points out, further research is necessary to understand the variations in academic performance between different gamification platforms.

The range of studies reviewed indicates the positive impact of gamification in the educational context, especially when the tools are adapted to specific learning objectives. Platforms such as Kahoot and Quizizz have been demonstrated to enhance information retention, while concurrently increasing student motivation and achievement in collaborative learning environments. In a more customized educational environment, games such as Calesca Mat exemplify the design of tools that cater to particular curricular requirements, such as the enhancement of mathematical aptitude. The utilization of personalized mechanics in these

games serves to enhance student interest and promote active engagement in the learning process.

This approach, which emphasizes the combination of rewards, competence, and challenges, aligns with instructional design principles that seek to maximize student motivation and engagement. The integration of playful elements, such as competition, cooperation, and reward, has been demonstrated to facilitate deeper learning and the acquisition of transversal competences, including social and emotional skills that extend beyond the mere retention of academic content. Furthermore, the flexibility intrinsic to gamification enables its implementation in various educational contexts, whether face-to-face, hybrid, or virtual, thereby adapting to the diverse teaching and learning modalities. This adaptability becomes a key advantage in distance education or flexible learning environments, where gamified tools can be adjusted to the needs of each student, promoting their participation in a meaningful way.

This research underscores the notion that motivation, understood as the driving force behind students' engagement with learning activities, constitutes a foundational element of gamification. According to Garris et al. (2002), motivation is defined as personal commitment to an activity, which directly influences the intensity of effort and persistence in the task. In a similar vein, Soriano (2001) posits that motivation is a dynamic process, subject to constant fluctuation. This implies that students' motivational states can be influenced by contextual factors and life experiences. Gamification is presented as an effective tool to stimulate both intrinsic motivation, which arises from the personal interest of students, and extrinsic motivation, which is generated through external rewards, such as points or medals (Palazón, 2015). According to Valderrama (2015), play is an intrinsically motivating activity that engages students for the simple pleasure of participating, creating learning situations that not only develop cognitive skills, but also emotional and social skills.

In this context, gamification offers solutions to the prevailing problems of student motivation and engagement, especially in the context of traditional education. Lee and Hammer (2011) posit that gamification has the potential to transform educational environments by leveraging the intrinsic motivation of games to address real problems and enhance participation in educational activities. However, in order to maintain student motivation in a gamified environment, it is essential to customize and adapt the tools to the individual needs of each student. In this sense, García et al. (2023) explore the concept of ubiquitous learning and its relationship with gamification, demonstrating that the combination of tools such as Packet Tracer and Quizizz not only improves academic performance, but also responds to different learning styles. This approach underscores the importance of adapting educational experiences to the individual needs of students, an aspect that Cuba and Pérez (2021) also highlight when analyzing the value of gamification in virtual environments, especially in distance education. The extant research on the subject indicates that the efficacy of gamification is contingent upon the consideration of learning styles diversity, a factor that enables the design of more inclusive and effective learning experiences for all students.

The application of gamification in education extends beyond the enhancement of motivation; it also fosters the cultivation of critical and collaborative skills in students. As posited by Ormazabal et al. (2023), the integration of gamified tools into the educational curriculum is of paramount importance. Peer-to-peer collaboration, cultivated through play, enables students to not only address challenges collectively but also to cultivate social and emotional competencies. This notion is corroborated by the findings of García et al. (2023), which underscores the imperative for educators to adapt their pedagogical approaches to accommodate the multifaceted learning styles prevalent within their instructional settings. The personalization of gamified experiences is imperative to maximize the potential of each student and ensure their inclusion in the learning process. Furthermore, gamification has been

demonstrated to be a particularly effective method for enhancing collaborative skills. Educational games are frequently designed to promote collaborative learning among students, fostering communication, negotiation, and cooperation skills. In these environments, students learn to recognize each other's strengths and weaknesses, distribute tasks, and work together to achieve common goals. Collaboration is defined as the process of working with others to achieve a shared goal. It encompasses a variety of activities, including the exchange of ideas, the joint resolution of problems, the collective decision-making process, and the provision of mutual support. These activities have been shown to enhance both interpersonal skills and leadership abilities.

- **Challenges in the implementation of gamification**

Notwithstanding the potential benefits, the implementation of gamification in the classroom is encumbered by several challenges. As posited by Ormazabal et al. (2023), meticulous planning is paramount to circumvent the superficial implementation of game elements. In the absence of a clearly delineated strategy, gamification risks becoming a superficial addition to conventional teaching methods, failing to engender a substantial transformation in the educational experience. This observation aligns with the concerns articulated by numerous researchers, who have noted that the absence of sufficient training for educators can impede the efficacy of gamification strategies. Therefore, it is imperative that educators receive training in the utilization of these tools to ensure the effective and relevant implementation of these tools.

The integration of gamification in educational settings, particularly in the classroom environment, poses a series of challenges. These challenges primarily pertain to the training and preparation of educators, as well as the effective incorporation of game-based dynamics into instructional methodologies. Despite the potential benefits offered by this strategy, studies such as those by Martí, Seguí, and Seguí (2016) indicate that only a small proportion of teachers adopt it, despite the fact that many recognize its value. This phenomenon can be attributed to the absence of formal training in gamification. Furthermore, Ormazabal et al. (2023) emphasize that inadequate planning can result in play elements becoming a superficial addition that fails to generate a substantial change in learning.

In this regard, it is imperative to align challenges with students' abilities in a precise manner to prevent demotivation. According to Castellón and Jaramillo (2013), a fundamental aspect for gamification to be effective is to maintain a balance between the challenges proposed and the skills of the students, so that interest and active participation are maintained. When challenges are either too facile or too arduous, they risk losing their capacity to edify, thereby reinforcing the significance of effective design.

Another salient challenge pertains to the implementation of rewards, which play a pivotal role in motivating students. The implementation of rewards must be meticulously orchestrated to guarantee that they serve as effective reinforcers of learning and do not devolve into a rudimentary extrinsic motivator devoid of pedagogical value (Chung et al., 2019).

It is imperative to acknowledge that gamification cannot be regarded as merely another technological instrument. It is imperative for educators to comprehend the integration of playful dynamics with pedagogical objectives to effect a genuine transformation in the educational experience, rather than succumbing to the superficiality that is characteristic of conventional teaching methods (Ormazabal et al., 2023). The implementation of gamification in education necessitates meticulous strategic planning and continuous professional development. It is imperative that educators do not merely utilize gamification as a tool; rather, they must cultivate a comprehensive understanding of its underlying principles and the ways in which it can be effectively integrated within the educational milieu.

- **Educational context and diversity**

The implementation of gamification in the educational field must be understood in relation to its context, as its effectiveness is profoundly influenced by the environment in which it is executed. This context encompasses not only the characteristics of the physical environment, but also the social and cultural dynamics of the classroom. According to García et al. (2023), the efficacy of gamified strategies is contingent upon the consideration of individual differences among students, including their learning styles, interests, and demographic characteristics. Given that each student encounters distinct challenges and possesses unique strengths, it can be concluded that a gamification strategy that yields positive results for one group of students may not necessarily have the same effect on another group. Consequently, it is imperative that educators engage in continuous assessment of their students' needs and characteristics to ensure the effective adaptation of gamified dynamics.

A salient finding from Fabre's (2023) research underscores the significance of social interaction in the learning process. Digital tools such as Kahoot have proven to be particularly effective in this regard, as they not only increase individual motivation through competition and recognition, but also promote collaboration and exchange among students. The act of students engaging in real-time interaction and collaborative problem-solving fosters the development of a dynamic and participatory learning environment, thereby enriching the educational process. This collaborative environment fosters not only social learning, but also the development of communication and teamwork skills, which are essential competencies in the 21st century.

The diversity present in contemporary classrooms poses an additional challenge for educators. In contemporary classrooms, there is an increasing presence of students from diverse cultural, linguistic, socioeconomic, and skill backgrounds. This phenomenon renders the use of homogenizing teaching methods an ineffective strategy. In this context, gamification provides a framework for personalizing learning experiences. By empowering students to proactively participate in their own educational process through engaging activities, educators can create customized experiences that align with students' diverse interests and learning speeds. However, this personalization necessitates a considerable investment of time and effort on the part of teachers to develop a comprehensive understanding of their students' individual strengths and areas that may require attention. Only through such a meticulous investment can teachers effectively tailor their pedagogical approaches to align with the unique needs and capabilities of each student group.

Furthermore, the concept of diversity underscores the necessity for educators to adopt a flexible and creative approach when designing gamified learning experiences. The crux of the matter lies in the capacity to adapt digital activities and tools in a manner that ensures inclusivity and respects the diverse needs of all students. It is incumbent upon educators to cultivate competencies that enable them to establish an inclusive learning environment, accommodating a diverse range of technological aptitudes, prior knowledge levels, and learning styles. This adaptability and creativity are critical to maximizing the impact of gamified strategies and ensuring that all students benefit from the educational experience equitably.

Consequently, the implementation of gamification should be regarded as a dynamic and flexible process that considers the diversity of students. Gamification is not a universally applicable solution; rather, it must be adapted and personalized for each group of learners, taking into account their differences and providing learning opportunities that foster both individual motivation and peer-to-peer collaboration. The presence of diversity in the classroom should not be regarded as a hindrance; rather, it should be regarded as a potential asset. The integration of gamification in teaching methodologies can serve to enhance the learning process. However, it is essential that educators possess the capacity to formulate inclusive experiences that align with the distinct requirements of their students.

- **Educators' perspective on gamification**

The perspective of educators is crucial for the successful implementation of gamification. A study by Cabello and Carrera (2017) found that many teachers express interest in integrating gamification into their practices, but often feel unsure about how to do so effectively. It has been demonstrated that professional training and the sharing of best practices among colleagues can serve as effective strategies to address this insecurity. Furthermore, it is imperative for educators to acknowledge the significance of gamification not only as a method of enhancing student motivation but also as a medium for promoting active and collaborative learning.

Game-based learning has emerged as a fundamental strategy for developing skills and motivating students in an ever-evolving educational context. Given the dynamic nature of the education sector, technological advancements have the potential to transform traditional teaching methods, which often lack dynamism and motivation (Oblinger, 2004). The integration of technologies and play elements in the classroom enables students to assume an active role in their learning, thereby promoting an experiential approach oriented to problem solving. This pedagogical approach has been shown to foster creativity, facilitate information management, encourage collaboration among peers, and strengthen critical thinking skills (Westera et al., 2008). Furthermore, by reducing the fear of error, it fosters an environment conducive to experimentation and learning from failures (Hanus & Fox, 2015).

Conversely, recent studies have emphasized the close connection between play and learning, demonstrating that games contribute to the development of emotional and cognitive skills while also being appealing and stimulating for students (Kenny & McDaniel, 2011). Conversely, games have been shown to promote social skills by allowing players to explore new identities and experiences (Perrotta et al., 2013). Additionally, these activities have been found to enhance attention, complex thinking, and strategic planning skills (Kirriemuir & McFarlane, 2004). Specifically, the integration of gamification with Information and Communication Technologies (ICT) provides students with opportunities to alleviate school monotony, immerse themselves in alternate realities, and stimulate exploration and critical thinking (Mitchell & Savill-Smith, 2004).

In this sense, gamification has established itself as a pedagogical tool that integrates playful elements with educational objectives, thereby motivating students and enriching their learning experiences, rendering them more dynamic and participatory. According to the extant literature, the methodology under discussion has been demonstrated to respond to fundamental psychological needs, such as a sense of achievement and autonomy (see Deci & Ryan, 1985). Furthermore, it has been shown to promote greater knowledge retention and active participation (see Hamari et al., 2014). However, its implementation necessitates a meticulous design adapted to the characteristics of each group, in order to circumvent the risk of falling into superficiality or excessive use of external rewards, which could curtail intrinsic motivation (Deci et al., 1999). Consequently, educators must balance the playful component with academic rigor, ensuring that games align with learning objectives and promote genuine intellectual engagement.

In the context of feedback, Hattie and Timperley (as cited in Reyes, 2015) delineate it as the information furnished by an external agent on academic performance in a learning activity, with the objective of maximizing the student's potential by adapting it to their formative stage. Conversely, the Peruvian Ministry of Education underscores the necessity for feedback to be grounded in empirical evidence, articulating both the merits and limitations of the learning process, as well as its strengths and areas that require enhancement (Jiménez, 2015). This practice is imperative for students to evaluate their progress and make the necessary adjustments (Alirio & Zambrano, 2011). Furthermore, it fosters a collaborative relationship

between teachers and parents, thereby motivating the student and reinforcing their self-esteem (Osorio & López, 2014; Fonseca, 2009).

Reyes (2015) posits that the fundamental purpose of feedback is to enable students to discern discrepancies between their current comprehension and the anticipated level, thereby facilitating the evaluation of their performance in relation to the established learning objectives. This process should be present at all stages of learning, acting as an advisory and guiding tool that reports on progress against the established goals and guides the planning of future activities to achieve them.

According to Quinteros (2022), Kahoot is a distinctive educational instrument that enables the acquisition of novel concepts and the review of previously taught subjects. The adaptability of this platform within the academic setting is paramount for its effective implementation. When analyzing its use in evaluation activities, its ability to motivate students is highlighted, which translates into greater participation and commitment in the classroom. While the exploration of alternative approaches to enhance its efficacy is recommended, Kahoot has emerged as an indispensable methodological strategy for educators, encouraging attendance and promoting more active interaction by students.

A notable benefit of this software is its array of features, which are meticulously designed to facilitate learning through a playful and engaging interface. It is imperative that educators who elect to employ this instrument possess a dynamic approach and the capacity to adapt to a variety of activities. It is imperative that educators possess the capacity to exercise strong leadership, thereby ensuring the effective management of classroom environments and the mitigation of potential disruptions or disciplinary issues that may emerge in the context of the Kahoot! platform.

A review of the relevant literature reveals that the integration of new technologies into the educational sector can yield substantial benefits for students, educators, and the educational community at large (Barrios et al., 2019; Febres et al., 2019; García, 2012; Granados et al., 2020; Guevara et al., 2021; López, 2013; Pérez & Saker, 2012; Pring, 2003; Ramírez, 2011; Rodríguez & Rey, 2017; Rodríguez, 2019; Sepúlveda, 2009). This assertion is supported by the findings of numerous studies, which demonstrate that the adoption of innovative technologies in educational settings can lead to notable advantages for students, educators, and the educational community as a whole (Barrios et al., 2019; Febres et al., 2019; García, 2012; Granados et al., 2020). Among these benefits, the availability of a variety of digital resources that facilitate collaboration between teachers and the development of joint educational projects stands out (Barrios et al., 2019; Febres et al., 2019; Granados et al., 2020; López, 2013; Pérez & Saker, 2012; Guevara et al., 2021; Rodríguez & Rey, 2017).

In the current age, the relationship between technology and education has evolved to a dialogical level, where technology serves as a crucial catalyst for fostering a culture of dialogue, critical thinking, and continuous pursuit of meaningful knowledge (Vigo et al., 2015). This approach engenders novel possibilities in terms of perception, language, narrative, and sensitivity, influencing the transformation of society and culture in general (Vigo et al., 2015). However, the effective integration of technology in educational institutions faces important challenges, such as the diversity of resources available, the differences in their practical use by teachers and students, and the need to align these resources with relevant pedagogical and didactic approaches (Coll, 2007). Addressing these challenges necessitates an enduring dedication to the cultivation of technological and pedagogical competencies among educators, in addition to a cooperative endeavor to seamlessly incorporate technology into the educational process (Coll, 2007).

A subsequent analysis of the ideas presented reveals a series of benefits inherent to education in virtual environments. The advantages encompass a range of technological adaptability and the cultivation of digital and cultural competencies among students. Furthermore, the capacity

of these platforms to modify pedagogical programs and adapt educational models to the evolving demands of the environment is acknowledged. The efficient management of information storage, the stimulation of collaborative learning in the network, and the reduction of digital divides are also fundamental aspects highlighted by the authors. Furthermore, it underscores the potential of these platforms to bolster multiculturalism through virtual mobility and the development of open teaching materials. Furthermore, emphasis is placed on the importance of providing new technological skills to students and redefining their work practices in an increasingly digitalized world. The fundamental role of these tools in promoting student engagement in the educational process and cultivating a strategic and critical analysis of information is emphasized.

Despite the positive findings in the extant literature on gamification, further longitudinal research is necessary to assess the long-term impact on learning and knowledge retention. Pergal and Lorenzo (2019) emphasize the necessity of complementing the immediate benefits in academic performance with studies that analyze how these methodologies affect the understanding of concepts over time. The evaluation of the efficacy of gamification should not be confined to the domains of motivation and academic performance. Instead, it should encompass the cultivation of critical skills and the students' aptitude for applying their acquired knowledge in authentic real-world settings.

CONCLUSION

The integration of information and communication technologies (ICTs) within the domain of gamification in education represents a substantial advancement in the realm of contemporary pedagogical practices. It is evident from the analysis that these tools signify a pivotal innovation, with the potential to enhance student interaction and engagement. Moreover, they offer an educational environment that is more adaptable to individual needs.

ICTs offer a plethora of interactive and dynamic resources that have the potential to transform learning experiences, rendering them more stimulating and relevant for learners. These tools, which range from gaming platforms to mobile applications and educational software, facilitate a more profound exploration of concepts, cultivate collaborative problem-solving, and nurture critical and analytical skills that are indispensable to holistic student development.

Furthermore, the integration of gamification with Information and Communication Technologies (ICTs) has been shown to enhance educators' capabilities. By facilitating the collection of data on student progress and performance, educators are able to refine their pedagogical strategies and provide customized feedback. This feedback has been shown to enhance the student's learning experience and facilitate teachers' identification of areas for improvement, thereby enabling them to optimize their educational practices.

In summary, ICT tools can be regarded as potent catalysts for the effective implementation of gamification in education. Their capacity to engage students, adapt the learning process to individual needs, and provide timely feedback makes them invaluable resources in the contemporary educational context. Nevertheless, it is crucial to emphasize that the efficacy of these tools is contingent upon their deliberate and situated incorporation into the design of authentic and meaningful learning experiences.

Conflict of interest

The authors declare that there is no conflict of interest for the publication of this scientific article.

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