Harnessing Gamification in Digital Classrooms: Enhancing Student Engagement, Motivation, and Cultural Inclusivity in Education

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Article Information	ABSTRACT
Article Type: Research Article **Dates:** **Received:** 9 March 2025 **Revised:** 16 April 2025 **Accepted:** 13 May 2025 **Available online:** 07 June 2025 **Copyright:** This work is licensed under Creative Commons license ©2025 **Corresponding Author:** Asma Zawar Shahani asmashahani@mail.ustc.edu.cn **ORCID:** https://orcid.org/0000-0003-4214-2923	This study reviews the impact of gamification on student engagement and educational outcomes to assess the student's strengths and weaknesses. Gamification motivates, increases knowledge retention, and makes learning an active process. In comparison, the challenges, including extrinsic rewards being relied upon too heavily, variations in student preferences across different cultures, and technological barriers, make thoughtfully designed and implemented important. Individualistic and collectivist cultures respond differently to the competitive and collaborative elements of gamified learning, influenced by cultural influences. Technological advancements are being fueled by a growing application of gamification in E-Learning systems and as a tool for higher education and corporate training. Whereas, the methods has been adopted in this study used a qualitative approach that would be appropriate to understand students' and educators' experiences, perceptions, and challenges in the gamification learning environment. Semi-structured interviews and focus group discussions were carried out to collect the data. Then, after collecting the data, we used the Heatmap visualization approach to visually represent the frequency and intensity of various themes we came across in the qualitative responses and those methods included trend analysis which enhancing robustness with other estimations. In addition the findings, by synthesizing current literature, this paper provides insights into how gamification can be effectively implemented in various educational contexts and offers recommendations for gamification implementation equitably and adaptively. Long-term impacts must drive future studies, the implications for culture, and the integration of adaptive technologies to ensure an inclusive and sustainable gamified education.

1. INTRODUCTION

In the age of rapid digital transformation, educational systems all over the world become integrated into learning environments through the use of digital technologies. Gamification has been identified among these innovative approaches as a promising approach to engaging students and improving educational outcomes (Bouchrika et al., 2021). Gamification is the application of game-related activities into non-game-related contexts, for example, in digital classrooms or E-Learning platforms. Gamification relies on the natural motivational power common to gaming, converting it into an interactive and engaging learning environment comparable to student experiences in gaming (Lampropoulos & Sidiropoulos, 2024).

With such a quick digital transformation in education, knowledge delivery has been completely transformed, particularly after global pandemics like the COVID crisis and war (Durrani & Ozawa, 2024; Wang & Wu, 2021). This shift towards E-Learning was a critical response to these crises as E-Learning emerged as a means to ensure education continuity even in the most challenging conditions. E-Learning has traditionally developed from elementary computer-based training of the 1990s to more high-tech platforms using multimedia, interactive tools, and virtual classrooms (Weggen & Urdan, 2000). During the COVID-19 pandemic, E-Learning became a lifeline, ensuring students could continue their studies from home since universities and schools were closed (Durrani & Ozawa, 2024). Both the advantages and disadvantages of adopting digital learning tools and online platforms demonstrated the rise of digital education in the digital era (Durrani & Ozawa, 2024; Oyediran et al., 2020). They contributed to adopting digital learning tools and online platforms worldwide.

However, this transition also exposed numerous inequalities among students, such as the lack of access to necessary technology or digital literacy. This led even more to the digital divide's development and further increased educational inequalities (Van De Werfhorst et al., 2022). Having given this, however, E-Learning is still a powerful tool, allowing students to access in the cities and remotely. Now that we are moving into a post-pandemic era, access to technology has become a means of maintaining it, not simply maintaining access; the concern is moving and ensuring that digital education is equitable, inclusive, and effective (Durrani & Ozawa, 2024).

Thus, in this context, gamification has proven to be a promising way to engage students and improve their learning outcomes in E-Learning settings. Gamification utilizes students' motivation by adding game elements like points, leaderboards, and badges to make sense of learning fun and joyful (Saleem et al., 2022). In the context of global health crises and war disruptions, this study explores the potential use of gamification in digital classrooms to improve students' performance. This research motivation aims to study how gamification can fill the digital education gap in engagement, knowledge retention, and problem-solving skills for digital learning methods in these times defined by unprecedented circumstances.

The origin of gamification is rooted in behavioral and cognitive psychology that attempts to leverage intrinsic and extrinsic motivators to drive active learning activities (Huang et al., 2020). Recent studies have pointed to gamification's potential to infuse digital learning with more immersion, competition, and awards, ultimately increasing students' motivation, knowledge retention, and problem-solving powers (Lampropoulos & Sidiropoulos, 2024). While these promised findings are encouraging, the efficacy of gamification in enhancing students' outcomes is still an area of continuing debate, with mixed reports in the literature. These challenges varying levels of student receptivity, cultural differences, and risk of over-gamification have complicated this discussion (Zeng et al., 2024).

This study examines how gamification can boost student connection and enhance educational performance during fast digital learning changes. Behavioral and cognitive psychology motivate instructors to use gamification systems to boost student participation when they learn digitally (Zhao et al., 2021). This

research aims to bridge existing knowledge gaps in how gamification works differently with students of varying traits and study the possible problems when gamification is overused.

Research shows gamification succeeds in motivating students and helping them learn and solve problems (Lampropoulos & Sidiropoulos, 2024). Yet experts continue to debate the results because many studies generated conflicting findings. This research supports understanding by examining how digital learning gamification affects students and what aspects of culture and engagement level may affect its success. Through its investigative approach, the study fills the gap in knowledge about using gamification to improve learning results.

The results of this study will show us how to use gamification properly while revealing both its positive and challenging aspects when added to digital teaching spaces. The results prove that gamification improves learning and connects students better, but these results differ from student to student and depend on how much gamification is applied. Research indicates that too much gamification reduces its advantages, so educators must properly combine game-based methods in their teaching spaces.

In this review study, we synthesized existing frameworks and empirical research exploring the multivariate influences of gamification on engagement and educational outcomes in digital learning. This study strives to provide a holistic understanding of gamification in modern education by critically scrutinizing the evidence for its strengths, weaknesses, and potential for future developments. Based on the above discussion, the current study posits a research question that will be explored.

"How does gamification of digital learning environments affect student engagement and educational outcomes across different contexts"?

1.1. Aim of the study

This review aims to analyze and consolidate current research on gamification in digital learning and identify its effectiveness in improving Pakistan's student engagement and educational outcomes. The paper also identifies gaps in the existing literature and proposes future research directions emphasizing context-specificity in how gamification can best be added to the learning pedagogy.

In the era of rapid digital transformation in education, not only has knowledge delivery been taken over by a new model, but there are also huge disparities in how students interact and gain access to and utilize education resources. In the case of digital equity, there is a stark divide for students from varying socio-economic contexts because they are either successful or not in utilizing digital technologies for learning. However, the COVID-19 pandemic exposed the previous inequalities in digital literacy to digital devices and technological infrastructure, as the institutions were forced to operate in remote and hybrid learning environments. Thus, these gaps underscore the fundamental requirement for better knowledge of how technology should be utilized in the instructional system so that it's relevant, fair, and efficient. This study examined how gamification as a digital innovation could engage students and enhance their learning outcomes. Gamification then transforms into integrating game design and play elements into the nongame contexts, like the eLearning platform, digital classrooms, etc., to improve student motivation, retention, and problem-solving skills in nongame contexts. Although gamification has been promised to be a golden opportunity to infuse educational gamification with its promising potential, existing research has found mixed results on the effectiveness of gamification in education. Some studies have found positive outcomes, while others have raised issues of over-gamification and diverse receptivity from students in different cultural and individual contexts. That is why the study seeks to explain such incongruities and provide empirical evidence of how gamification plays its role in dealing with the challenges of students' engagement

and learning impacts in the context of the digital age. The study's significant findings are that gamification effectively increases student engagement and learning outcomes, mainly when used smartly in digital learning environments. For instance, ways of incorporating points, badges, and leaderboards have increased student participation and boosted motivation, especially for students who could not cope with standard studying methods.

Additionally, students exposed to a gamified learning environment showed better knowledge retention and improved problem-solving abilities, which favors the idea that gamification leads to deeper engagement and sustained memory. The study, however, also assesses that gamification receptivity to students also depends on their cultural background and individual learning preference. In particular, the research also discovered that too much gamification, or excessive use of game mechanics, could abrade students' involvement and likely result in student forcefulness. Finally, the study shows how gamification helps in real-life critical thinking and collaboration, two crucial successful work skills, also in real life. This adds to the larger stomp on the gamification topic, which lays bare the institute needed to implement proper gamification techniques and offers some hints for educators, policymakers, and technological developers.

2. LITERATURE REVIEW

2.1 Understanding and mechanisms in gamification in education

The definition of gamification involves applying game design elements, such as points, badges, leaderboards, levels, challenges, and rewards in nongame environments to engage and motivate users (Qiao et al., 2023). These game mechanics are developed in fields of education in order to engage with active participation, stimulate intrinsic motivation, and enhance the learning outcome. The basis for educational gamification is psychological: goal-setting, feedback, and social interaction can turn conventional passive learning into an immersive, interactive experience (Khaleel et al., 2020).

Educators seek to exploit the playful aspects to infuse educational platforms with dynamic and interactive learning experiences. Using gamification systems improves learning outcomes by ensuring consistent engagement with content and rewarding completion of tasks or achievements (Antonaci et al., 2019). For instance, progress bars and leaderboards let the students follow their progress, while rewards for completing tasks encourage a little friendly competition (Saleem et al., 2022). Despite its widespread adoption, however, it remains a hotly debated topic in academic research vis-à-vis its actual effectiveness in promoting student learning and motivation (Qiao et al., 2023).

2.2 Effects of gamification on student engagement

Academic success depends so much on student engagement that it cannot be considered peripheral. Gamification enhances engagement positively on both emotional, behavioral, and cognitive levels. Features, such as rewards and recognition, make learning more emotional and create positive feelings associated with learning (Imani & Montazer, 2019). The gamified activities increase behavioral engagement by conducting tasks, setting goals, and peer collaboration. Challenges and problem-solving tasks within a gamified system drive cognitive engagement and have students think critically and deeply about the content (Sahito & Sahito, 2024).

According to Antonaci et al. (2019), gamification helps emotionally and behaviorally engage gamified players through positive behavior rewards and instant feedback. Assignments are more likely to be completed, and students are more likely to engage with the class when they are 'gamified' with rewards of tangible or public kudos via leaderboards and badges (Huang et al., 2020). Khan et al. (2017) stressed that gamification can induce social interaction, collaboration, and a sense of belonging among students. These benefits lead to a more inclusive, more interactive way of digital learning.

2.3 Educational outcomes and academic performance

Some studies have explored what gamification is and how it relates to academic performance. The literature shows that gamification is effective in active learning, critical thinking, and knowledge retention, resulting in better academic outcomes (Bai et al., 2020). Gamified systems offer immediate feedback, which allows students to understand where he/she stands and where they can shift their gears to do things better. Aiming at a mastery orientation through this approach puts count on the fact that students start focusing on getting better at understanding their stuff rather than just doing it to get rewards from the outside (Zeng et al., 2024).

Nevertheless, some researchers, such as Bai et al. (2020), claim that too much extrinsic motivation can undermine intrinsic learning. However, when students place more value on rewards than on engaging with the subject matter in a meaningful way, the long-term benefits of gamification may not be that great. Also, gamified environments designed poorly can yield very little in addressing individual learning preferences, resulting in disengaged and frustrated students (Khaleel et al., 2020).

2.4. Gamification in education

A few challenges would make gamification less effective in the educational world. The biggest concern is that extrinsic rewards are relied on too much and can actually diminish the intrinsic worth of learning (Zainuddin et al., 2020). When students get obsessed with points, badges, or leaderboards, they might not be able to develop self-regulation skills for lifelong learning. Furthermore, poorly designed gamification systems can be frustrating if the challenges are difficult to achieve or the rewards are meaningless.

A second issue is attendance to the range of student preferences and how students learn. Not all students like a gamified environment; some will be left out or demotivated by competitive elements. One example is Yu et al. (2021), who found that leaderboards such as the type in which students compete can discourage students who prefer approaches to learning such as collaborative or reflective. On top of it all, gamification needs significant technological investments, training, and often much money that not every educational establishment can afford (Zeng et al., 2024).

Table 1: Below provides a summary of 10 key studies on gamification in education

Author(s)	Focus	Findings
(Al Fatta et al., 2018)	Definition and framework	Established foundational elements of gamification and its application to education.
(Das et al., 2025)	Psychological mechanisms	Highlighted intrinsic and extrinsic motivators behind gamification in learning.
(Revishvili & Tsereteli, 2024)	Engagement and feedback	Found that immediate feedback in gamified systems enhances emotional and behavioral engagement.
(Thirakulwanich et al., 2020)	Social interaction	Emphasized collaboration and social engagement benefits in gamified environments.
(Popescu et al., 2022)	Learning outcomes	Demonstrated improved knowledge retention and critical thinking in gamified settings.
(Popescu et al., 2022)	Student diversity	Reported varying impacts of gamification on different student demographics.
(Bovermann & Bastiaens, 2020)	Motivation types	Warned about the risks of over-reliance on extrinsic rewards in gamification.

(Jitsupa et al., 2022)	Intrinsic vs. extrinsic motivation	Suggested that intrinsic learning might decline when gamification focuses too heavily on rewards.
(Malas & Hamtini, 2016)	Design challenges	Highlighted the need for culturally relevant and equitable gamification systems.
(Huang & Hew, 2021)	Adaptive gamification	Proposed adaptive gamification to address individual learning preferences and styles.

3. METHODOLOGY

3.1. Data collection

This study aims to investigate the effect of gamification on students' engagement and the quality of Pakistan's education through qualitative research design. Thus, the study used a qualitative approach that would be appropriate to understand students' and educators' experiences, perceptions, and challenges in the gamification learning environment. The study aimed to examine the effect of game elements (pieces) such as points, badges, leaderboards, rewards, and progress bars on enhancing students' motivation and engagement and increasing learning outcomes.

Semi-structured interviews and focus group discussions were carried out to collect the data. These methods were chosen to enable the receipt of open-ended responses that would encourage participants to elaborate further on their experiences and through offering rich detail. Interviews with Students: Semi-structured interviews were carried out among several students from various higher education institutions in Pakistan. The students were from universities, colleges, and online platforms adopting gamified learning systems. These interviews aimed to elicit highly detailed insights into the students' experiences of gamification and the impact that different game mechanics (e.g., points, badges, and leaderboards) have on the student's motivation and engagement. Several key aspects of these elements were explored in the interviews: perceived effectiveness of gamified elements, how these elements influenced their approach to learning, motivation level, and how these elements contributed to academic performance.

In addition to individual interviews, focus group discussions on gamification with groups of students were made to obtain the group perspective. These discussions offered opportunities for students to interact and discuss together with each other about what they had gone through in a more dynamic environment and identify common themes. They explored the extent to which the gamified elements of the learning added to, detracted from, or completely impacted the amount of enjoyment of learning, the amount of social interaction engendered both in the game aspects of leaderboards and collaborative challenges, and any challenges or frustrations faced by the students in the gamified environment.

Interviews with Educators and Administrators: Some interviews also took place with educators and administrators who have set up gamified learning systems in their institutions. These interviews aimed to gain insight into the motivations for the adoption of gamification, its establishment in the curriculum, and the consequences of gamification for student engagement and performance. With specific gamification tools in mind, educators were asked about using these tools for the specific intended goals and any challenges. In gamification, administrative support is offered, along with broader institutional support for gamification and its integration into the overall educational strategy.

3.2. Data analysis: Heatmap and Trend analysis

Then, after collecting the data, we used the Heatmap approach to visually represent the frequency and intensity of various themes we came across in the qualitative responses. Typically, a heatmap is useful for quantitative data and qualitative analysis (Hong & Jung, 2017). This study used the heatmap to see which gamification elements were mentioned most frequently in all interviews and focus group discussions. For instance, the heatmap then visualized the complementarity of some of these themes, such as when many participants told us about the positive impact of rewards or badges on their engagement. The technique quickly identified the main themes and gamification features that played the most important role in students' motivation and academic performance.

In order to evaluate if there were any changes in student perceptions and engagement over time, the heatmap was accompanied by a trend analysis. For example, we inquired whether students' attitudes toward gamification changed with the time course of a semester or academic year. The trend analysis attempted to see patterns like when novelties of gamified learning lost their appeal after some months or when engagement and motivation stayed intact. With these trends, we looked and could determine if gamified learning had a lasting impact on student's academic behaviors and their wishes to engage in course content.

3.3. Enhancing robustness with other estimations

This study used qualitative data collection methods and analysis techniques; however, some aspects of the robustness and depth of the findings could be improved. A first approach could be thematic coding, in which the interview and focus group responses are driven and systematized into themes. This procedure makes sure that the analysis is well-rounded and well-ordered. The content analysis could be another way to examine how the participants talk about their experience with gamification. This might yield subtle variations in how students perceive gamification and whether their perceptions of it differ depending on demographic factors like age, gender, or subject area. Another important thing is that to increase the reliability and validity of these findings, member checking could be conducted, asking the participants to check whether the findings in the study are consistent with their experience. It may help to handle the bias posed by the researcher and guarantee that the results are primarily based on the participants' experience.

This study utilized qualitative methods, including semi-structured interviews and focus group discussions, to explore the effects of these gamification elements on students' engagement and academic performance in Pakistan. Data taken from students, educators, and administrators helped learn the usefulness of gamification in motivating learning, increasing collaboration, and better learning. Heatmaps and trend analysis were conducted to obtain recurring themes and patterns, identifying what gamification does to a student's behavior over time. For future studies, these findings would benefit from more robustness and consequently could be improved by adding more qualitative analytic approaches, like thematic coding and content analysis.

4. MODEL ANALYSIS: TREND ANALYSIS AND HEATMAP

In this study, those methods included Trend Analysis and Heatmap Visualization to analyze the data generated from interviews and focus group discussions. These models were used to see what themes, patterns, and interdependencies exist between the gamification elements and student engagement, motivation, and academic performance.

4.1. Trend analysis

We saturated the data with Trend analysis to identify patterns or changes in the data over time. Since this is a qualitative study attempting to determine how students experience gamification in their learning process, the purpose of the trend analysis was to follow any changes in attitudes and engagement over different durations of time.

To give an instance, we examined what happened to students' participation and motivation after exposure to gamification for an unending period. We were interested in guessing whether the novelty of the gamified elements wore off over time and whether that affected engagement or if the students found a long-term value in the gamified learning systems.

In order to conduct the trend analysis, the study did the following:

Categorization of data on a time basis: The data was divided into different periods (e.g., early semester, later semester) to identify response changes with time.

The reasoning behind design changes: The resource still uses specific gamification techniques (reward, leader board), but were engagement levels rising or fluctuating? The game may need tweaks and changes. We tracked motivation shifts in the intrinsic or extrinsic motivation of students in the use of gamified systems. For example, did students override initial reactions to the novelty of rewards and recognition by the deeper learning motivation over time?

By doing this analysis, we learned if and how gamification retains or changes student participation over time and if the design of new elements or whether features currently in use in the classroom were modified affected student participation.

4.2. Heatmap visualization

The frequency and intensity of the responses regarding particular gamification elements were represented as heatmaps. Heatmaps are a simple and concrete way to show the people which themes or features the participants mentioned the most.

The heatmap was used in the context of this study as: Map the Gamification features: Points, badges, leaderboards, progress bars, and rewards have meaningful associations, which can have a bigger impact on student engagement and motivation. Visualizing the data helped us identify which attributes in gamification were the most important for enhancing the students' learning experience. For example, if the top motivators mentioned were badges and leaderboards, a heatmap would indicate high intensity in those areas. It also allows us to compare more than one student group (e.g., by discipline and academic year) and to find out whether some gamification aspects have been more successful for a specific group of students.

However, the goal is to improve the robustness of the existing model: Trend analysis and heat-maps helped to understand the relationship between gamification and student engagement. However, more methods can be used to help the analysis model become more robust and valid. Improvements to the existing model can be made as follows:

Thematic Coding: This would entail planning and using code that organizes certain data into themes or codes, which can enhance the understanding of how different gamification elements will impact student behaviors and motivations. Raw data from coding interviews and focus groups can also be coded, and thus, by doing so, we can discover recurring patterns and insights that were not evident in the raw data. Moreover, this will aid in an organized approach to analyzing the data.

Content Analysis: This would use content analysis, where we would read the language of people in interviews and group discussions to pick up on the shades in their attitudes and perceptions about

gamification. Discovering these hidden or implicit themes that were not so much directly included in the questions but rather naturally came up in the discussions would help this analysis.

Member checking could be used to check the accuracy of the findings and minimize researcher bias. After putting the data together, this could be provided to participants to share their feedback. This would enable participants to check if they had seen the interpretation of their answers okay and whether the findings rang a bell with them.

Triangulation: This would strengthen the results. Therefore, it consists of using multiple data sources (e.g., interviews, focus groups, and institutional data) or different analytical methods (e.g., qualitative and quantitative approaches) to check the findings and ensure that they are consistent and original.

The integration of the additional techniques mentioned above could help validate the findings and increase the robustness of the study's analysis model, leading to a better and more accurate understanding of the effect of gamification on student engagement and academic performance.

5. RESULTS AND DISCUSSION
5.1. Gamification in education benefits

The benefits of gamification are too vast to incorporate into the learning experience. Gamification is the technique that integrates game elements into the process, such as challenges, rewards, and leaderboards, to keep motivation and encourage rise. Transforming passive learning into an active and participatory process is undoubtedly one of the key advantages. Progress bars, points, and badges help distinguish pathways for goal setting and reward achievement and help students feel ownership of their journey of learning (Shenoy & Kumar, 2024). These game mechanics engage behavioral, emotional, emotional engagement, and cognitive by continually forcing critical thinking and problem-solving.

The second key is the increase in knowledge retention. By piling up repetitive and interactive activities, gamified learning environments help retain complex information. The students remember what they have learned when the lessons are tied up with fun and rewarding activities. In addition, it stimulates peer-pair or group collaboration. Equally, social features, including team challenges and peer competitions, add communication and teamwork to the educational experience (Suartama et al., 2023). The core feature of gamification that involves real-time feedback helps students know that they are making progress and lets them change their strategy immediately to achieve better learning outcomes.
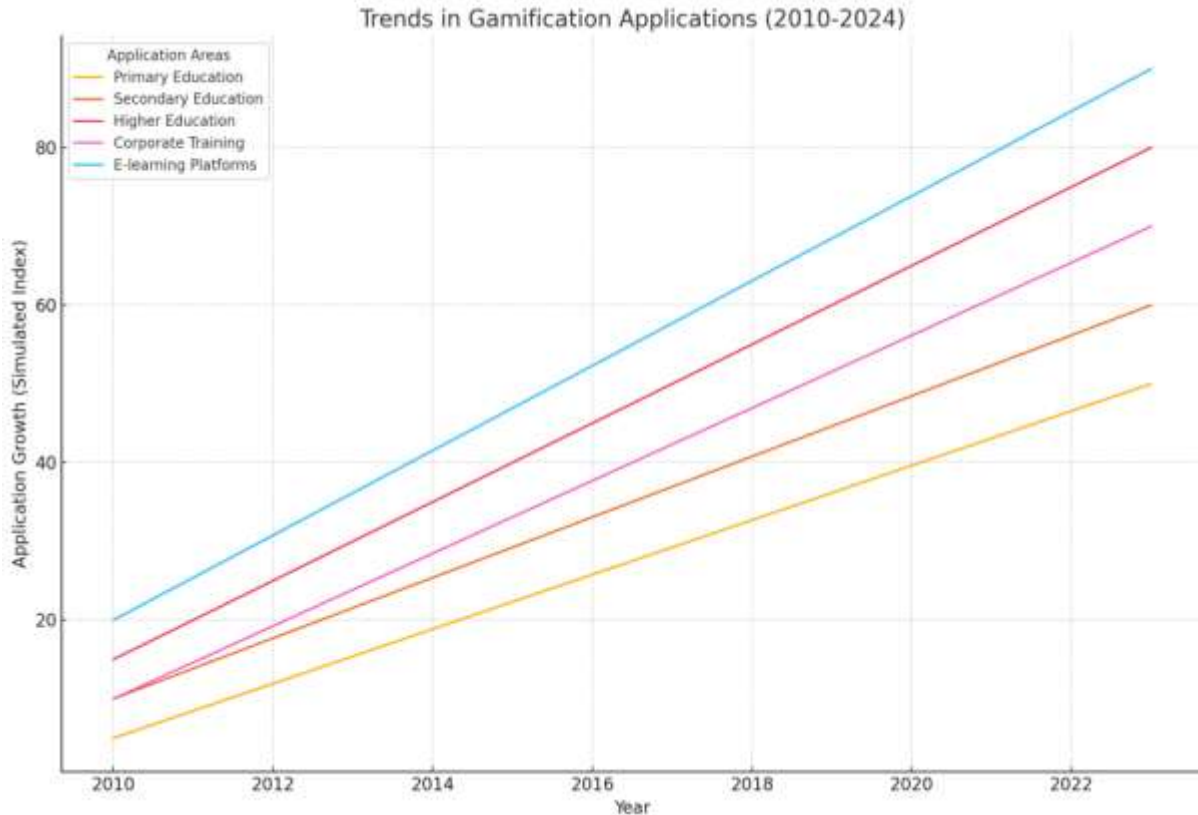
Figure 1: Trends in gamification applications

Figure 1 above illustrates the trends in gamification applications across various sectors from 2010 to 2024. E-Learning platforms demonstrate the most substantial growth, reflecting their pivotal role in digital education. Higher education and corporate training also show significant increases, indicating their adaptation of gamification to enhance learner engagement and skill development. Secondary education follows a steady upward trend, while primary education shows slower but consistent growth, reflecting its gradual adoption in early learning environments. These trends highlight the expanding influence of gamification in diverse educational and training contexts over time.

5.2. Gamification challenges and risks

Gamification offers some great benefits but also has its problems. The over-dependence on extrinsic motivators such as points, badges, and leaderboards is a significant concern. Focus on extrinsic rewards to achieve these elements can take away from intrinsic motivation, which focuses more on this subject than on achieving the rewards. Once it engages with content this way, it does not guarantee long-term learning outcomes (Alzahrani & Alhalafawy, 2022). Gamification systems can exacerbate this problem if poorly designed. Consider, for example, this: if rewards are not perceived as relevant or challenges are more difficult than students can handle, they will be frustrated and disengaged.

Another obstacle is that it cannot conform to the diverse students with different learning styles. Most gamified environments are designed for competition, but some students do not like the competitive setting. Nevertheless, research has shown that others are drawn to competition and thrive under it. At the same time, some school kids can feel alienated or demoralized when their performance continually lags behind their classmates (Hallifax, 2020). This highlights the demand for adaptive gamification systems catering to individual differences and learning preferences. Furthermore, gamification is resource intensive, and there

is training that needs to be done by the educator and by purchasing technology, which is not feasible for all educational institutions, particularly in underprivileged regions.

5.3. Research in gamification trends

Gamification research trends indicate an uptick in the use of gamification applications across the educational setting. The increasing number of studies based on gamification since 2010 shows its intimacy with confronting educational issues. The early stages of research mostly focused on using gamification to enrich student engagement and retention (Chinchua et al., 2022). During this time, the scope of the study expanded into collaborative learning, personalized education, and the integration of adaptive technologies. Moreover, gamification research is mostly geographic, with major development and implementation of gamified learning platforms documented in North America and Europe and experience in developing and implementing gamified learning platforms in Asia. While the literature grows on the subject, one trend observed is an evolution in the gamification strategy toward equity-centric methods and technologies to support a more personalized learning experience via artificial intelligence technologies. This trend makes adapting gamification to diverse educational needs possible.

We present a heatmap of research activity, indicating how research has spread globally in gamification studies. Darker shades represent higher research levels in a given region and year. This visualization features the global relevance of gamification and its growing prominence in the discussion within educational research.
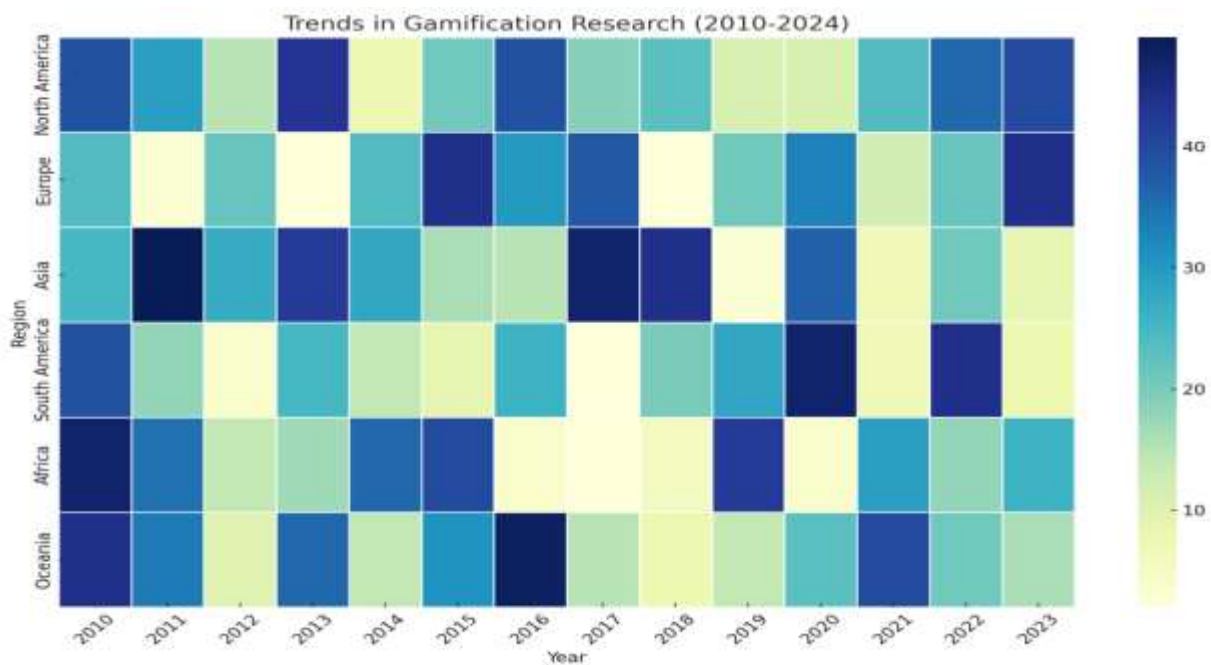

Figure 2: Trends in gamification research

The trends in gamification research from 2010 to 2024 are shown in the heatmap (see figure 2) above by region, with the peak of activity in each shown as a red point, and graphically demonstrates increasing activity over time. Research activity in gamification has been highest in North America, Europe, and Asia due in part to their leadership in developing and applying gamification technologies in education. The rise of interest in gamification over the years indicates how people perceive it to be a game changer for education.

The continued rise of this trend reinforces the pressing need for objectively innovative and inclusive gamification tactics that seamlessly interface with disparate educational spaces around the globe.

5.4. Benefits and challenges balancing

While it is not easy, gamification presents a compelling avenue for improving the learning environment using the digital. The popularity of research interest in gamification and the consistently positive outcomes indicate that gamification can tackle some contemporary education challenges (Harini, 2023). However, gamification requires careful attention to thoughtful and inclusive design that caters to various students' needs and preferences. Therefore, we argue that educators must balance extrinsic and intrinsic motivators within given gamified systems while remaining accessible and scalable in unrelated contexts.
Educationalists and policymakers can maximize the utility of the game (Smith & Abrams, 2019). Future work in gamification research, which continues to trend, will likely begin to focus on the use of adaptive technologies, cross-cultural applications, and new ways to improve student engagement and learning outcomes.

Therefore, the impact of gamification needs to be depicted through a graphical representation. We present a bar chart of the percentage distribution of key advantages derived from the reviewed studies. Motivation is the most significant reported outcome, representing 30 percent of reported outcomes. That contributes to 25% improved knowledge retention and 20% active participation. While less emphasized, the other 15% and 10% come from social collaboration and real-time feedback.
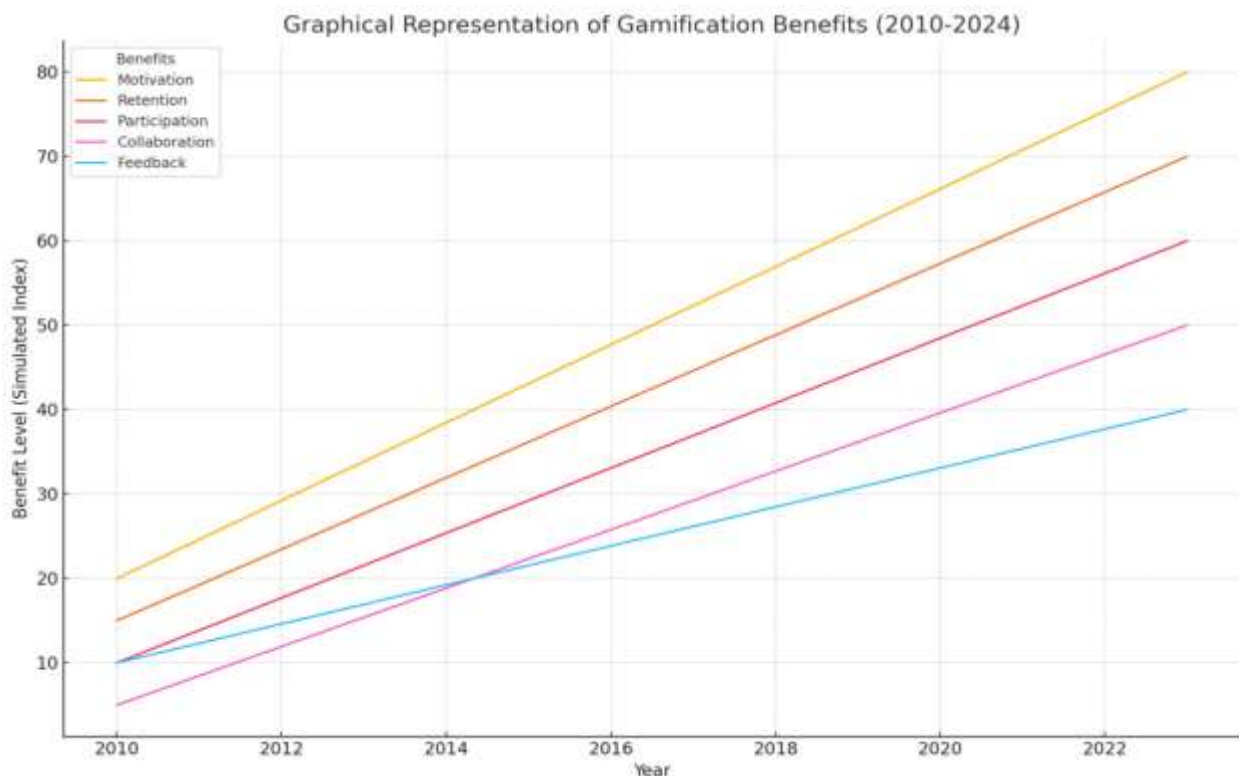

Figure 3: Gamification in education benefits

Figure 3 shows the trends of the key gamification in education benefits from 2010 to 2024. Its role in the gamified learning environment is the most dominant and most consistent observed growth, which is motivation. It is important for reinforcing knowledge and active involvement (Amo et al., 2020; Zeng et al.,

2024). Retention, and participation also score important upward trends. Starting from lower levels, though spurts at the beginning, collaboration and feedback rise steadily over time, emphasizing that in gamified education, social and interactive aspects have consistently become more important (Huang et al., 2020). This summarizes how gamification has benefitted and will continue to benefit more and more in educational practices.

5.5. Gamification's cultural impacts

Gamification in education contexts benefits from the critical role played by the cultural context in shaping its design, implementation, and effectiveness. Rewards, challenges, competition, and collaboration can be gamified elements that can have different impacts on respective cultures' norms, values, and societal expectations (Chen et al., 2023). This should be understood so that gamified learning environments will be inclusive and effective for all populations worldwide (Almeida & Simoes, 2019).The conductivity of competition versus collaboration is also a fundamental cultural feature. We have found that gamification elements emphasizing personal achievement, leaderboards, and rewards are received well by individuals of more individualistic cultures (like what exists in many Western countries). Competitive gamification strategies help these cultures to motivate learners to succeed in real life. However, in collectivist cultures, such as in many Asian and African countries, gamification also will not work for all cultures because group-oriented gamification part will be more effective as a team-based challenge and collaborative rewards (Almeida & Simoes, 2019; Lampropoulos & Sidiropoulos, 2024). Collaborative features become more appealing and more motivating if these societies place a higher value on group harmony and shared achievements (So et al., 2017).

The issues surrounding gamification failure and risk-taking also differ in different cultures. In cultures where failure is seen as a chance to learn and grow, gamified systems featuring frequent challenges and iterative feedback will be eagerly adopted. Learners of such kinds are likely to be comfortable trying new strategies without being stigmatized in such a culture (Zeng et al., 2024). However, in cultures with considerable consequences for failure or even failure is considered a sign of incompetence, these features can seem to breed anxiety and disengagement. For example, in East Asian cultures, students might desire gamification designs that operate in a structured manner and are at low risk of observing high-risk failure (Algashami, 2019).

Cultural responses also influence gamification's symbolic and aesthetic aspects of reward design, avatars, and themes. Platforms that are gamified but run within a specific culture, where, for example, people use culturally specific imagery, language, and metaphors, are more likely to attract learners. A good way to make any learning that is relevant or interesting to the learner is to use local symbols or familiar culturally relevant scenarios. However, the use of foreign or culturally alienating elements in gamification can cause alienation of the learner and diminish the gamification effect (Hadi Mogavi et al., 2022).

Furthermore, the level of adoption of technology and digital literacy differs with cultures, which also affects the access and adoption of gamified learning. More learners inhabit technologically advanced areas and are more open to sophisticated gamification systems using augmented reality or AI personalization. Conversely, areas with limited technological infrastructure may require less complex gamification approaches that rely less on expensive gadgetry and cord cuts and, thus, on connectivity (Saleem et al., 2022). This proves that to use gamification strategies, one should consider the target audience's technological readiness. In addition, gamification is subject to cultural norms regarding authority and hierarchy, which affect how learners react to gamification. In high power distance cultures where authority figures are more respected and learning is more teacher-driven, gamification systems with structured, instructor-driven guidance could be more effective (Huang et al., 2020). In contrast, learners in low-power

distance cultures, where self-directed exploration, exploration, and decision-making are both encouraged and facilitated, may do better in gamified environments than the other way around (Tobon et al., 2020).

Finally, the cultural values underlying intrinsic and extrinsic motivators that stimulate engagement in gamification are discussed. If cultures focus on extrinsic rewards, gamification elements such as badges, points, and material incentives may have more power (Angelelli et al., 2023). On the other hand, cultures prioritizing intrinsic motivation and self-fulfillment are more likely to respond favorably to gamified systems based on growth, mastery, and self-expression. It is necessary to tail the gamification design to the learners' cultural context to render its use maximally effective (AHMED et al., 2025). That means much cultural stuff needs to be done, and it will take many iterations of the gamification strategies to make them culturally appropriate. Gamified learning can then address these cultural impacts to be more inclusive, equal, and impactful environments across diverse educational environments (Bouchrika et al., 2021).

6. CONCLUSION

Gamification has proven to be a transformative tool in digital education, significantly enhancing student engagement, motivation, and learning outcomes. By incorporating game elements such as rewards, challenges, collaboration, and competition, gamified learning environments actively involve students and promote better knowledge retention. Motivation emerges as the most dominant factor driving these positive effects, reinforcing learner participation and deeper understanding of educational content. However, the success of gamification is not universal; it is deeply influenced by cultural, technological, and individual learner factors. Cultural differences shape how gamified elements are perceived and experienced. For example, individualistic cultures often respond well to competition and personal achievement-focused gamification elements, while collectivist cultures are more motivated by team-based challenges and collaborative rewards. Additionally, attitudes toward failure and risk-taking vary across cultures, influencing whether frequent challenges and iterative feedback are welcomed or cause anxiety.

Cultural sensitivity is also critical when designing the symbolic and aesthetic components of gamification. The use of culturally relevant imagery, language, and themes helps learners connect with the content, while culturally alien elements may reduce engagement. Technological readiness also affects gamification adoption; learners in technologically advanced regions benefit from sophisticated, personalized gamification systems, whereas less developed areas may require simpler, low-tech solutions to ensure inclusion. Moreover, cultural norms related to authority and autonomy impact gamification effectiveness. In high power-distance cultures, structured, teacher-led gamified approaches tend to be more successful, while learners from low power-distance cultures prefer self-directed and exploratory gamified experiences. The balance between intrinsic and extrinsic motivation must also be carefully managed, as cultural values influence which motivators resonate best with learners. To fully unlock gamification's potential, future efforts should focus on adaptive, culturally sensitive designs supported by educator training and accessible technology. Long-term research and cross-cultural studies are essential to tailor gamified learning experiences effectively. By addressing these challenges, gamification can help create inclusive, engaging, and equitable educational environments that meet diverse learners' needs worldwide.

6.1 Recommendations

Drawing from the findings from this review, it is therefore recommended that teachers and policymakers develop and take advantage of specific gamification strategies tailored to each student's needs and preferences. Adaptive gamification systems, which utilize artificial intelligence in order to personalize a learning experience, prove to be a promising solution to such problems. Also important is to keep the ratio

between intrinsic and extrinsic motivators relatively equal to encourage students to stay excited without neglecting the intrinsic allure of learning. To ensure gamification is being used effectively, educators need training and support. Finally, we should invest in inexpensive and scalable tech to make gamified learning available to all learners irrespective of their socio-economic background.

6.2 Future work and limitations

The following steps for the gamification of education as a field of research will be to conduct longitudinal investigations around the long-standing effects on learning outcomes. Another important area of research is investigating the potential of adaptive gamification better to satisfy the participants' diverse learning styles and needs. Moreover, cross-cultural studies are needed to investigate how gamification works with students from different cultural and socio-economic backgrounds. The limitations of this study include some aspects of knowledge of the complexity of gamification in education, which were taken from old literature. Compared to prior research, gamification design and implementation are variable from one study to another, making it difficult to generalize findings. In addition, limited access to technology continues to impede gamified learning, which many under-resourced areas still lack.

Ethical Statement: This study was conducted in accordance with ethical guidelines. Informed consent was obtained from all participants prior to their involvement. The research involved human participants through interviews, and ethical approval was granted by the Institutional Review Board of Xiamen Huaxia University. Participants were informed about the study objectives, their right to withdraw at any time, and the confidentiality of their data, which was used solely for research purposes.
Consent to Participate: Before conducting this research study, the researcher obtained permission from the host department at Xiamen Huaxia University. The objectives of the study were clearly explained to the respondents before the interviews. Respondents were assured that their information would be used exclusively for research purposes. They were also informed that they could withdraw from the interview at any stage if they felt uneasy or did not wish to continue.
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