Berajah Journal
Published by: CV Lafadz Jaya | ISSN: 2797-1805 | E-ISSN: 2797-1882

Volume 6 No. 4 (2026)
Page: 1315 –1326
https://ojs.berajah.com/index.php/go/

GAMIFICATION IN E-LEARNING: ITS IMPACT ON MOTIVATION AND LEARNING ACHIEVEMENT

Baso Intang Sappaile,[1]* Elisa Mayang Sari,[2] Abdun Wijaya,[3]
Universitas Negeri Makassar[1]
Politeknik Manufaktur Negeri Bangka Belitung[2]
Universitas Islam Negeri Siber Syekh Nurjati[3]
***Email Correspondence:** baso.sappaile@unm.ac.id

Received: 01-05-2026 | **Revised**: 20-05-2026 | **Accepted**: 01-06-2026 | **Published**: 26-06-2026

Abstract

With e-learning becoming more and more common at all educational levels, the advancement of digital technology has fueled the transformation of the learning process. Low student involvement and motivation, however, continue to be obstacles to the adoption of online learning. Gamification, or the use of game elements in an educational setting to improve learning, is one popular strategy to deal with this problem. The purpose of this study is to examine how gamification in e-learning affects learning outcomes and student motivation. A literature study was the research methodology employed, looking at numerous pertinent books, scholarly publications, and scientific papers about gamification in digital learning environments. According to the study's findings, gamification components including points, badges, levels, challenges, leaderboards, and reward systems can boost students' motivation both internally and externally. Additionally, by making learning more engaging and pleasurable, gamification enhances academic accomplishment, learning persistence, active involvement, and engagement. However, the learning design, student characteristics, and how well the game components fit the intended learning objectives all affect how effective gamification is. In order to maximize the advantages of e-learning-based learning processes, gamification must be implemented in a methodical manner. This study advances a more comprehensive knowledge of gamification's function as a cutting-edge tactic to raise the caliber of online education in the age of educational reform.

Keywords: Gamification, E-Learning, Learning Motivation, Learning Outcomes, Digital Learning

INTRODUCTION

The digital transformation occurring in various sectors of life has brought significant changes to education systems worldwide. Information and communication technology advancements have prompted educational institutions to implement a variety of innovative teaching strategies that can satisfy students' demands in the digital age. One rapidly developing innovation is e-learning, a learning system that utilizes digital technology and the internet as the primary medium for delivering materials, learning interactions, and evaluating learning outcomes (Saleem et al., 2022a). E-learning provides a number of benefits, including time and location flexibility, simple access to educational materials, and the chance to establish a more transparent and cooperative learning environment. Students can access educational resources at any time and from any location via e-learning platforms, depending on their unique needs and learning style (Kaya & Ercag, 2023).

Despite its numerous advantages, the implementation of e-learning still faces several challenges that can impact the effectiveness of the learning process. One major challenge is low student motivation to participate in online learning. Unlike face-to-face learning, which allows for direct interaction between educators and students, e-learning often leads to feelings of isolation, a lack of emotional engagement, and a decrease in student attention to the material being studied. These conditions can result in low levels of active participation in learning activities, decreased task completion rates, and reduced learning outcomes.

DOI: https://doi.org/10.47353/bj.v6i4.712

Various studies have shown that learning motivation is a critical factor determining student success in digital learning environments. Students are more likely to actively participate in the learning process and attain the best learning results when they are more motivated (Li et al., 2022).

The issue of learning motivation in e-learning has become increasingly relevant with the increasing use of digital technology in education. Many students experience boredom due to online learning methods that tend to be monotonous and lack engaging learning experiences. Material delivery that focuses solely on text, videos, or assignments without adequate interactivity often causes students to lose interest in learning. Furthermore, the presence of various digital distractions in online learning environments can also reduce students' focus and concentration (Lampropoulos & Sidiropoulos, 2024a). Therefore, innovative strategies are needed to increase student engagement and motivation so that e-learning can run effectively.

One approach currently receiving considerable attention in digital education is gamification (Bennani et al., 2022a). Gamification is the application of elements commonly found in games to non-game contexts, including learning environments. This approach aims to increase motivation, engagement, and user experience through the use of various game mechanics such as points, badges, levels, challenges, rewards, leaderboards, and engaging feedback systems. In the context of e-learning, gamification is not intended to completely transform learning into a game, but rather to integrate game elements that can encourage learners to be more active and motivated in participating in the learning process.

Gamification in e-learning is thought to offer a lot of potential to make learning more pleasurable and significant. The sensation of accomplishment, competence, and advancement that game features can offer can motivate students to keep participating in educational activities. Students are more likely to be motivated to keep learning when they receive points or awards for doing specific tasks. Additionally, having specific goals and challenges might encourage students to take ownership of their education (Sabri et al., 2022a). Thus, gamification can create a more interactive learning environment than conventional online learning approaches.

Not only does it influence learning motivation, but gamification is also believed to be closely linked to improved learning outcomes. High motivation can encourage students to interact more frequently with learning materials, allocate more time to study, and demonstrate perseverance in completing various academic activities. In the end, this enhances critical thinking abilities, conceptual comprehension, and general academic success. Numerous studies have demonstrated that pupils who participate in learning with a gamification approach tend to have higher levels of participation than those who participate in learning without gamification elements. Furthermore, they also show improvements in cognitive, affective, and behavioral engagement, which contribute to learning success (Temel & Cesur, 2024).

However, the effectiveness of gamification in e-learning does not always show uniform results. Several studies have found that the success of gamification is greatly influenced by the quality of the learning design, student characteristics, the learning context, and the appropriateness of the game elements used. For example, using gamification that focuses too much on competition can have different impacts on each individual. Some students may feel challenged and motivated, while others may feel stressed or uncomfortable. Therefore, implementing gamification requires careful planning to ensure that the game elements used truly support the achievement of learning objectives and are not merely entertainment.

In the context of 21st century educational development, the need for learning strategies that can increase motivation and learning outcomes is becoming increasingly important. Educational institutions are required to not only provide access to learning technology, but also ensure that this technology is used

DOI: https://doi.org/10.47353/bj.v6i4.712

effectively to support students' learning experiences. Gamification offers an opportunity to answer these challenges by presenting a more adaptive, interactive and learner-centered approach. Through the integration of appropriately designed game elements, e-learning can become a learning tool that is not only effective in delivering material, but also able to build students' motivation and involvement on an ongoing basis (Tsarev et al., 2025).

This description makes it crucial to carry out research on how gamification in e-learning affects motivation and learning result achievement. Developing more creative and successful digital learning strategies can be based on a thorough understanding of the connection between gamification, learning motivation, and learning results. Additionally, it is intended that this study's findings would help educators, learning platform developers, and education stakeholders create e-learning environments that can enhance the caliber of learning procedures and outcomes in the digital era. Thus, research on gamification in e-learning has high relevance in supporting educational transformation that is more adaptive to technological developments and the needs of today's students.

LITERATURE REVIEW

The Concept and Characteristics of Gamification in E-Learning

The development of information technology has shifted the learning paradigm from being educator-centered to being more student-oriented. In this context, e-learning has emerged as an innovation that enables flexible, interactive learning processes that are not limited by space or time. However, the success of e-learning implementation depends not only on the sophistication of the technology used, but also on the learning system's ability to create engaging learning experiences and maintain student engagement. One approach increasingly being implemented Gamification is a way to raise the caliber of online learning sessions. The use of game aspects in non-gaming contexts to boost user motivation, engagement, and participation in particular tasks is known as "gamification" (Khaldi et al., 2023). Gamification is a learning approach used in education that integrates game elements without diminishing the primary learning objectives.

The application of gamification in e-learning is generally through the use of various game elements such as points, badges, levels, leaderboards, challenges, missions, and rewards (Saleem et al., 2022b). These elements are designed to create a more engaging learning experience than conventional digital learning methods. Points are awarded as a token of appreciation for completing specific tasks or activities, while badges serve as symbols of achievement, demonstrating students' success in reaching learning targets. A level system allows students to see their development gradually, while a leaderboard creates a competitive atmosphere that can foster learning enthusiasm. Furthermore, learning challenges and missions provide clear objectives, further motivating students to consistently complete learning activities (Sabri et al., 2022b).

Theoretically, gamification is closely linked to motivational theory and constructivist learning theory. Motivation theory explains that individuals tend to engage more actively in an activity when they receive rewards, recognition, or satisfaction from it. Meanwhile, the constructivist approach emphasizes that knowledge is built through experience and active interaction with the learning environment. Gamification accommodates both approaches by providing an environment that allows students to engage in challenging learning experiences while providing rapid feedback on every action taken. Through this mechanism, students are not merely passive recipients of information but also play an active role in constructing their own understanding (Halachev, 2024).

DOI: https://doi.org/10.47353/bj.v6i4.712

Another characteristic that makes gamification relevant in e-learning is its ability to support personalized learning. Every learner has different needs, abilities, and learning styles. Gamification enables learning systems to provide challenges and rewards tailored to the learner's ability level, making the learning process more adaptive. Furthermore, the interactive features within gamification can increase learners' emotional engagement with the learning material. Thus, gamification serves not only as a tool to enhance learning appeal but also as a strategic approach capable of creating more effective, meaningful, and learner-centered learning experiences in e-learning environments.

The Effect of Gamification on Student Learning Motivation

Learning motivation is one of the factors determining student success in achieving learning objectives. In e-learning environments, motivation plays an increasingly important role because students are required to demonstrate a higher level of independence compared to face-to-face learning. Limited direct interaction with educators often leads to decreased learning interest, low participation, and reduced commitment to completing learning activities (Jaramillo-Mediavilla et al., 2024). Therefore, strategies are needed to increase learning motivation so that students remain actively engaged in the digital learning process. Gamification is considered an effective approach because it integrates engaging and challenging elements into the learning environment.

The application of gamification can increase students' intrinsic motivation by creating a fun and meaningful learning experience. When students successfully complete a task and earn rewards in the form of points, badges, or level advancements, they feel a sense of accomplishment that can boost self-confidence and personal satisfaction. This sense of accomplishment encourages students to continue learning activities and strive to fulfill their upcoming objectives. In this situation, gamification functions as both an entertainment tool and a mechanism that of building an internal drive for continuous learning (Lampropoulos & Sidiropoulos, 2024b).

In addition to influencing intrinsic motivation, gamification also has a positive impact on extrinsic motivation. Various elements such as leaderboards, digital rewards, and recognition for achievement can encourage students to improve their learning performance. Healthy competition can foster a drive to achieve better results than before. However, the competitive aspect of gamification needs to be carefully designed to avoid creating undue pressure for students with varying abilities (Luarn et al., 2023). Therefore, a balance between individual rewards and group collaboration is a crucial factor in increasing the effectiveness of gamification on learning motivation.

Furthermore, gamification can reduce the level of boredom that often occurs in online learning. Monotonous learning activities tend to cause students to lose focus and interest in the material being studied (Zhang & Yu, 2022). By introducing interactive game elements, students become more engaged and engaged in the learning process. They no longer view learning as merely an obligation, but as an activity that provides challenges and enjoyable experiences. This has resulted in increased active participation, frequency of access to learning materials, and persistence in completing assigned tasks. Thus, gamification plays a significant role in increasing student motivation and supporting the successful implementation of e-learning at various levels of education.

DOI: https://doi.org/10.47353/bj.v6i4.712

METHOD

This study examined the effects of gamification in e-learning on learning outcomes and student motivation using a literature review method. This approach was used since it enables researchers to gain a comprehensive understanding of conceptual developments, empirical findings, and research trends related to gamification in digital learning. The research data sources included scientific articles, conference proceedings, academic books, and relevant research publications obtained from various reputable scientific databases. Keywords including gamification, e-learning, learning motivation, student engagement, and learning achievement were used in the literature search. Research on the application of gamification in online learning environments and its effects on student motivation and learning outcomes was the main focus of the chosen literature.

Data analysis was conducted through the stages of identification, selection, evaluation, and synthesis of literature that met the criteria of relevance to the research objectives. Each source was analyzed to identify the forms of gamification implementation, the game elements used, and their impact on motivation and learning outcomes. Next, the collected research results were compared and interpreted to identify patterns, similarities, and differences in findings that emerged across various learning contexts. Through this literature synthesis approach, the research produces a deeper understanding of the effectiveness of gamification as an innovative strategy in e-learning, while identifying factors that influence the success of its implementation in improving the quality of digital learning.

RESULTS AND DISCUSSION

Increasing Learning Motivation through the Implementation of Gamification in E-Learning

Significant changes in the field of education have been brought about by the advancement of digital technology, especially with the introduction of e-learning platforms that allow for flexible learning procedures free from temporal and spatial limitations. Low student motivation, however, is a major problem with online learning because of the lack of face-to-face interaction, boring content delivery, and low emotional engagement during the learning process. In this regard, gamification—the incorporation of game aspects into digital learning environments has emerged as a novel strategy that can boost learning motivation. The concept of gamification uses gaming elements like points, badges, leaderboards, challenges, missions, and reward systems to boost student engagement in reaching academic goals rather of turning the main learning aim into a game (Saleem et al., 2022c).

The implementation of gamification in e-learning has been proven to increase both intrinsic and extrinsic student motivation. Intrinsic motivation develops when students experience pleasure, satisfaction, and a sense of accomplishment while completing learning activities. Game elements provide a more engaging learning experience, encouraging students to learn not only by academic demands but also by curiosity and personal satisfaction. Meanwhile, extrinsic motivation arises through rewards, recognition, or specific achievements that can be directly observed through the learning system. The combination of these two forms of motivation creates a more dynamic learning environment and motivates pupils to participate fully in all learning phases (Bennani et al., 2022b).

Increasing learning motivation through gamification is also closely related to Self-Determination Theory, which emphasizes the importance of basic psychological needs such as competence, autonomy, and social connectedness. In an e-learning environment that implements gamification, students have the opportunity to demonstrate their competence by completing tasks and achieving specific targets. The level

DOI: https://doi.org/10.47353/bj.v6i4.712

and reward system provides clear feedback on students' development, increasing their confidence in the learning process. Furthermore, the freedom to choose a learning path or complete challenges according to their own abilities provides an experience of autonomy that strengthens learning motivation. On the other hand, collaborative features such as group competitions, online discussions, and leaderboards create social interactions that enhance a sense of connectedness among learners (Jayalath & Esichaikul, 2022).

The reward element in gamification plays a crucial role in maintaining long-term learning motivation. In conventional learning, learners often only receive feedback at the end of the learning process through exam or assignment scores. In contrast, gamification systems provide immediate and continuous feedback so learners can track their progress in real time. When learners successfully complete a task and earn points or badges, they feel rewarded for their efforts. This positive experience encourages them to continue participating in subsequent learning activities (Rahayu et al., 2022). Thus, the learning process is no longer viewed as a burdensome obligation but as a challenging and enjoyable activity.

In addition to increasing motivation, gamification also contributes to increased learner engagement in online learning. A high level of engagement is one indicator of a successful learning process because it demonstrates active participation and sustained attention to the material being studied. Through a learning design that adopts game mechanics, students become more focused on completing assignments, taking quizzes, and participating in online discussions. Gradually designed challenges allow students to experience a progressive learning experience, encouraging them to reach higher levels of achievement. This creates a positive cycle of motivation that continuously strengthens students' interest in learning.

The application of gamification in e-learning also has a positive impact on learning retention. One common problem in online learning is the high level of boredom, which causes students to lose interest before completing the entire learning material. The presence of game elements can reduce this boredom by creating a more interactive and varied learning experience. Students tend to have a higher commitment to completing each learning stage because they want to earn rewards or achieve specific targets. Thus, course completion rates and academic success can increase significantly compared to e-learning systems that do not incorporate gamification elements (Ghawail & Yahia, 2022).

However, the success of gamification implementation depends heavily on the quality of the learning design. Excessive use of game elements without considering pedagogical objectives can cause students to focus more on rewards than on the learning process itself. Therefore, gamification integration must be designed in a balanced manner, taking into account student characteristics, learning objectives, and the context of the material being taught. Game elements should be used as a means to enhance the learning experience, not replace the academic content that is the core of the educational process. The right approach will enable gamification to serve as an effective tool in increasing motivation while supporting the achievement of optimal learning outcomes.

The implementation of gamification in e-learning significantly contributes to improving student learning motivation. Through the use of various game elements, students gain a more engaging, interactive, and meaningful learning experience. This increased motivation is reflected not only in higher participation and engagement in learning but also in increased persistence, self-confidence, and academic success (Ghawail & Yahia, 2022). Therefore, gamification can be viewed as a relevant, innovative strategy to address the challenges of digital learning in the era of educational transformation, as well as a potential approach to creating an effective, adaptive, and learner-centered learning environment.

DOI: https://doi.org/10.47353/bj.v6i4.712

The Role of Gamification in Increasing Student Engagement and Active Participation

Gamification has become an innovative approach widely applied in modern education to increase student engagement and active participation (Cigdem et al., 2024). The concept of gamification refers to the application of game elements such as points, badges, levels, challenges, rewards, leaderboards, and feedback systems to non-game contexts, including the learning process. The presence of gamification in educational environments not only aims to create a more enjoyable learning environment but also serves as a pedagogical strategy capable of encouraging students' intrinsic and extrinsic motivation. In the digital era, marked by changing characteristics of learners who tend to prefer interactivity, visualization, and dynamic learning experiences, gamification is a relevant approach to address the challenge of low student engagement in conventional learning processes (Leong, 2025).

Student engagement is a crucial indicator of learning success because it relates to students' levels of attention, interest, enthusiasm, and commitment during learning activities. In traditional learning, students often act as passive recipients of information, resulting in relatively limited interaction. This can lead to decreased learning motivation, poor concentration, and suboptimal learning outcomes. The implementation of gamification can transform these learning patterns by providing a more interactive and participatory learning experience. Through a structured system of rewards and challenges, students are encouraged to actively engage in each learning activity because they have clear goals and receive direct feedback on each achievement (Hellín et al., 2023).

The application of gamification also contributes to increasing student motivation. Motivation is a psychological factor that significantly influences a person's engagement in the learning process (García-López et al., 2023). The game elements implemented in gamification can create a sense of accomplishment, competence, and satisfaction when students successfully complete tasks or reach specific targets (Allehaidan & Wan Zainon, 2024). For example, awarding points and badges can recognize students' efforts, while a leveling system can create a sense of continuous development. This encourages students to continue participating in learning activities and completing assigned tasks. Furthermore, rapid feedback allows students to immediately assess their level of success, boosting their confidence and enthusiasm for learning.

From an active participation perspective, gamification can encourage students to engage more frequently in discussions, collaboration, and problem-solving. Learning activities, structured as specific challenges or missions, empower students to feel a greater role in the learning process. They not only receive information from educators but are also challenged to explore knowledge, find solutions, and make decisions independently. This creates a more meaningful learning experience because students interact directly with the learning material. Furthermore, the use of game mechanics can stimulate students' curiosity, encouraging them to continue exploring new information and deepening their understanding of the material being studied (Cordero Valera et al., 2026).

Gamification also plays a crucial role in building a competitive and collaborative learning environment. Features like leaderboards can motivate students to improve their performance through healthy competition. On the other hand, various team-based activities integrated into gamification can strengthen cooperation and communication among students. Through collaboration in completing group challenges or missions, students learn to share ideas, respect others' opinions, and work together to achieve common goals. The social interactions formed during this process not only foster active participation but also help develop social skills and teamwork skills, which are essential in the 21st century.

DOI: https://doi.org/10.47353/bj.v6i4.712

Another advantage of gamification is the capacity to provide a customized and flexible learning environment. In digital learning platforms that implement gamification, students can learn at their own pace and ability. The system can provide different challenges based on students' competency levels, so they remain challenged without experiencing excessive pressure. This approach helps reduce boredom and frustration that often arise when learning material is perceived as too easy or too difficult. This allows students to sustain a high degree of involvement during the educational process (Suartama et al., 2024).

In addition to improving cognitive aspects, gamification also has a positive impact on students' affective aspects. A fun and interactive learning environment can reduce anxiety and increase comfort in learning. Students become more willing to try, make mistakes, and refine their understanding without fear of failure. In this context, failure is seen as part of the learning process, providing valuable experience for achieving success in the next stage. This mindset is crucial for developing resilient, creative learners with critical thinking skills (Department of Educational Technology, State University of Malang, Indonesia. He is also with the Department of Educational Technology, Veteran Bangun Nusantara University, Indonesia et al., 2024).

The development of digital technology further strengthens the efficiency of gamification in raising student involvement and engagement. To provide more engaging learning experiences, gamification aspects have been included into a variety of learning platforms, including Learning Management Systems (LMS), educational apps, and interactive learning media.Through the use of this technology, students can access learning materials anytime and anywhere while still enjoying a game-like learning experience. This flexibility allows the learning process to be more student-centered and supports the creation of lifelong learning.

The Impact of Gamification on Learning Outcomes in Digital Learning

Gamification in digital learning has become an innovative approach that significantly contributes to improving student learning outcomes. In the increasingly digitalized context of modern education, the learning process is no longer limited to one-way interactions between educators and students, but has evolved into a more interactive, adaptive, and technology-based system. In order to provide a more interesting and significant learning experience, gamification makes use of game aspects including points, levels, challenges, prizes, immediate feedback, competition, and collaborative tools. The application of this concept not only aims to increase student engagement but also directly and indirectly influences the achievement of optimal learning outcomes (Jun & Lucas, 2024).

In digital learning, learning outcomes are often influenced by students' levels of motivation, engagement, and consistency in participating in the learning process. Gamification can provide a stimulus that encourages increased learning motivation through structured reward mechanisms. When students earn points or rewards for successfully completing certain tasks, they feel recognized for their efforts. This recognition serves as positive reinforcement that strengthens active learning behavior. Psychologically, the reward system in gamification can create a sense of ongoing achievement, encouraging students to continuously improve their performance in the digital learning process (Saleem et al., 2022d).

Beyond the motivational aspect, gamification also has an effect in enhancing comprehension of academic ideas. Learning resources are frequently presented as tasks or missions that must be finished in phases in gamification-based digital learning. With this method, students can learn the content in a more organized and contextualized way. Every learning stage that is successfully finished offers instant feedback,

DOI: https://doi.org/10.47353/bj.v6i4.712

enabling students to assess their comprehension level right away. This rapid feedback is crucial in the learning process because it helps students identify errors and correct them before moving on to the next stage (Sabri et al., 2022c). Thus, the learning process becomes more effective and supports significant improvements in learning outcomes.

Gamification also plays a role in improving knowledge retention, or students' recall of learning materials. In traditional learning systems, students often struggle to retain information long-term due to a lack of active engagement during the learning process. In contrast, in gamification-based learning, students are actively involved in various activities such as problem-solving, decision-making, and solving challenges that require a deep understanding of concepts. This active engagement helps strengthen cognitive processes, making the information learned more easily stored in long-term memory. Furthermore, the use of visual, audio, and interactive elements in gamification enriches the learning experience, contributing to improved student retention (Bharti, n.d.).

From a learning evaluation perspective, gamification enables a more dynamic and continuous assessment system. Unlike conventional evaluation systems, which tend to focus on end-results, gamification allows for gradual assessment through various activities students undertake throughout the learning process. Every achievement, both small and large, can be recorded in the form of a score or specific indicator that reflects the student's learning progress. This system provides a more comprehensive picture of the learning process, not just the end-results. Thus, educators can intervene more timely if students encounter learning difficulties, thereby continuously improving the quality of learning outcomes (Cheng, 2023).

The implementation of gamification in digital learning also improves students' critical thinking and problem-solving skills. Through challenge-based learning designs, students are encouraged to analyze situations, evaluate information, and determine appropriate strategies for completing tasks. This process involves higher-order thinking skills, which are crucial for achieving quality learning outcomes. Furthermore, the competitive element in gamification can encourage students to seek more effective and efficient solutions, so they not only complete tasks but also strive to achieve better results than before. This indirectly improves the quality of learning outcomes.

Another equally important impact of gamification is increased student learning independence. In a digital learning environment that implements gamification, students have greater control over their own learning process. They can determine their own pace of learning, choose challenges to complete, and review material they don't yet understand. This independence encourages students to take greater responsibility for their learning process. When students have greater control, they tend to be more active in seeking information and completing assignments without relying too much on educators. This positively contributes to improved learning outcomes because the learning process becomes more personalized and tailored to individual needs (Taşkın & Kılıç Çakmak, 2023).

Furthermore, gamification has the potential to improve learning outcomes by fostering a more pleasant and engaging learning environment. Students' frequent feelings of tension and worry during the learning process can be lessened by a comfortable learning environment. When students feel comfortable, they are more likely to concentrate and be more receptive to the learning material presented. This is especially important in digital learning, which often demands a high level of focus. With the introduction of game elements, learning is no longer perceived as a burden but as an engaging and challenging activity, thus optimally improving learning outcomes.

DOI: https://doi.org/10.47353/bj.v6i4.712

Developments in digital technology also strengthen the effect of gamification on educational results. Numerous online learning resources, include educational applications, and web-based learning systems, have integrated more sophisticated gamification features. This integration enables real-time learning data analysis, allowing for accurate monitoring of student progress. Educators can use this data to evaluate the effectiveness of learning and design learning strategies that better meet students' needs. With the support of this technology, gamification becomes not only a motivational tool but also a crucial instrument for systematically and measurably improving the quality of learning outcomes.

CONCLUSION

The implementation of gamification in e-learning significantly contributes to raising student learning motivation, according to the findings of the research review. It has been demonstrated that incorporating gaming components like points, badges, levels, challenges, and reward systems results in a more engaging, interactive, and enjoyable learning experience. This not only increases intrinsic motivation through a sense of achievement and learning satisfaction, but also strengthens extrinsic motivation through a reward system and recognition for achievements. Thus, gamification is an innovative and effective approach to addressing the low learning motivation often encountered in e-learning.

Furthermore, gamification also has a favorable effect on reaching learning objectives and raising student engagement. Students are encouraged to participate more actively, engage with the material more frequently, and get a deeper comprehension of the subjects being studied in a more interactive learning environment. In the end, better overall learning results are a result of this greater involvement. However, proper learning design, matching game aspects to learning objectives, and student characteristics all play a major role in how successful gamification is. Therefore, in order to improve the quality of digital learning, gamification in e-learning must be implemented in a methodical manner.

REFERENCES

Allehaidan, A. F., & Wan Zainon, W. M. N. (2024). Gamification and student engagement in higher education: The moderating role of concentration. *Revista Amazonia Investiga*, *13*(79), 57–70. https://dialnet.unirioja.es/servlet/articulo?codigo=9759969

Bennani, S., Maalel, A., & Ben Ghezala, H. (2022a). Adaptive gamification in E-learning: A literature review and future challenges. *Computer Applications in Engineering Education*, *30*(2), 628–642. https://doi.org/10.1002/cae.22477

Bennani, S., Maalel, A., & Ben Ghezala, H. (2022b). Adaptive gamification in E-learning: A literature review and future challenges. *Computer Applications in Engineering Education*, *30*(2), 628–642. https://doi.org/10.1002/cae.22477

Bharti, M. K. (n.d.). *Exploring the Impact of Gamification on Students' Motivation, and Learning Outcomes in Secondary Education*.

Cheng, Y.-M. (2023). What makes learners enhance learning outcomes in MOOCs? Exploring the roles of gamification and personalization. *Interactive Technology and Smart Education*, *21*(2), 308–330. https://doi.org/10.1108/ITSE-05-2023-0097

Cigdem, H., Ozturk, M., Karabacak, Y., Atik, N., Gürkan, S., & Aldemir, M. H. (2024). Unlocking student engagement and achievement: The impact of leaderboard gamification in online formative assessment for engineering education. *Education and Information Technologies*, *29*(18), 24835–24860. https://doi.org/10.1007/s10639-024-12845-2

Cordero Valera, J. A., Del Águila, M. T., & Enríquez Canto, Y. (2026). Student perceptions of effectiveness, satisfaction, and active participation with online gamification in health sciences education. *Discover Education*, *5*(1), 196. https://doi.org/10.1007/s44217-026-01198-2

Department of Educational Technology, Universitas Negeri Malang, Indonesia. He is also with the Department of Educational Technology, Universitas Veteran Bangun Nusantara, Indonesia, Subiyantoro, S., Degeng, I. N. S., Kuswandi, D., & Ulfa, S. (2024). Developing Gamified Learning Management Systems to Increase Student Engagement in Online Learning Environments. *International Journal of Information and Education Technology*, *14*(1), 26–33. https://doi.org/10.18178/ijiet.2024.14.1.2020

García-López, I. M., Acosta-Gonzaga, E., & Ruiz-Ledesma, E. F. (2023). Investigating the Impact of Gamification on Student Motivation, Engagement, and Performance. *Education Sciences*, *13*(8), 813. https://doi.org/10.3390/educsci13080813

Ghawail, E. A. A., & Yahia, S. B. (2022). Using the E-Learning Gamification Tool Kahoot! To Learn Chemistry Principles in the Classroom. *Procedia Computer Science, Knowledge-Based and Intelligent Information & Engineering Systems: Proceedings of the 26th International Conference KES2022*, *207*, 2667–2676. https://doi.org/10.1016/j.procs.2022.09.325

Halachev, P. (2024). Gamification as an e-learning tool: A Literature Review. *E-Learning Innovations Journal*, *2*(2), 4–20. https://doi.org/10.57125/ELIJ.2024.09.25.01

Hellín, C. J., Calles-Esteban, F., Valledor, A., Gómez, J., Otón-Tortosa, S., & Tayebi, A. (2023). Enhancing Student Motivation and Engagement through a Gamified Learning Environment. *Sustainability*, *15*(19), 14119. https://doi.org/10.3390/su151914119

Jaramillo-Mediavilla, L., Basantes-Andrade, A., Cabezas-González, M., & Casillas-Martín, S. (2024). Impact of Gamification on Motivation and Academic Performance: A Systematic Review. *Education Sciences*, *14*(6), 639. https://doi.org/10.3390/educsci14060639

Jayalath, J., & Esichaikul, V. (2022). Gamification to Enhance Motivation and Engagement in Blended eLearning for Technical and Vocational Education and Training. *Technology, Knowledge and Learning*, *27*(1), 91–118. https://doi.org/10.1007/s10758-020-09466-2

Jun, M., & Lucas, T. (2024). Gamification elements and their impacts on education: A review. *Multidisciplinary Reviews*, *8*(5), 2025155. https://doi.org/10.31893/multirev.2025155

Kaya, O. S., & Ercag, E. (2023). The impact of applying challenge-based gamification program on students' learning outcomes: Academic achievement, motivation and flow. *Education and Information Technologies*, *28*(8), 10053–10078. https://doi.org/10.1007/s10639-023-11585-z

Khaldi, A., Bouzidi, R., & Nader, F. (2023). Gamification of e-learning in higher education: A systematic literature review. *Smart Learning Environments*, *10*(1), 10. https://doi.org/10.1186/s40561-023-00227-z

Lampropoulos, G., & Sidiropoulos, A. (2024a). Impact of Gamification on Students' Learning Outcomes and Academic Performance: A Longitudinal Study Comparing Online, Traditional, and Gamified Learning. *Education Sciences*, *14*(4), 367. https://doi.org/10.3390/educsci14040367

Lampropoulos, G., & Sidiropoulos, A. (2024b). Impact of Gamification on Students' Learning Outcomes and Academic Performance: A Longitudinal Study Comparing Online, Traditional, and Gamified Learning. *Education Sciences*, *14*(4), 367. https://doi.org/10.3390/educsci14040367

Leong, W. Y. (2025). Beyond the Screen: Enhancing Student Engagement in Virtual Classrooms Using Gamification. *2025 14th International Conference on Educational and Information Technology (ICEIT)*, 188–193. https://doi.org/10.1109/ICEIT64364.2025.10976109

Li, X., Xia, Q., Chu, S. K. W., & Yang, Y. (2022). Using Gamification to Facilitate Students' Self-Regulation in E-Learning: A Case Study on Students' L2 English Learning. *Sustainability*, *14*(12), 7008. https://doi.org/10.3390/su14127008

Luarn, P., Chen, C.-C., & Chiu, Y.-P. (2023). Enhancing intrinsic learning motivation through gamification: A self-determination theory perspective. *International Journal of Information and Learning Technology*, *40*(5), 413–424. https://doi.org/10.1108/IJILT-07-2022-0145

Rahayu, F. S., Nugroho, L. E., Ferdiana, R., & Setyohadi, D. B. (2022). Motivation and Engagement of Final-Year Students When Using E-learning: A Qualitative Study of Gamification in Pandemic Situation. *Sustainability*, *14*(14), 8906. https://doi.org/10.3390/su14148906

Sabri, Z., Fakhri, Y., & Moumen, A. (2022a). The Effects of Gamification on E-learning Education: Systematic Literature Review and Conceptual Model. *Statistics, Optimization & Information Computing*, *10*(1), 75–92. https://doi.org/10.19139/soic-2310-5070-1115

Sabri, Z., Fakhri, Y., & Moumen, A. (2022b). The Effects of Gamification on E-learning Education: Systematic Literature Review and Conceptual Model. *Statistics, Optimization & Information Computing*, *10*(1), 75–92. https://doi.org/10.19139/soic-2310-5070-1115

Sabri, Z., Fakhri, Y., & Moumen, A. (2022c). The Effects of Gamification on E-learning Education: Systematic Literature Review and Conceptual Model. *Statistics, Optimization & Information Computing*, *10*(1), 75–92. https://doi.org/10.19139/soic-2310-5070-1115

Saleem, A. N., Noori, N. M., & Ozdamli, F. (2022a). Gamification Applications in E-learning: A Literature Review. *Technology, Knowledge and Learning*, *27*(1), 139–159. https://doi.org/10.1007/s10758-020-09487-x

Saleem, A. N., Noori, N. M., & Ozdamli, F. (2022b). Gamification Applications in E-learning: A Literature Review. *Technology, Knowledge and Learning*, *27*(1), 139–159. https://doi.org/10.1007/s10758-020-09487-x

Saleem, A. N., Noori, N. M., & Ozdamli, F. (2022c). Gamification Applications in E-learning: A Literature Review. *Technology, Knowledge and Learning*, *27*(1), 139–159. https://doi.org/10.1007/s10758-020-09487-x

Saleem, A. N., Noori, N. M., & Ozdamli, F. (2022d). Gamification Applications in E-learning: A Literature Review. *Technology, Knowledge and Learning*, *27*(1), 139–159. https://doi.org/10.1007/s10758-020-09487-x

Suartama, I. K., Sudarma, I. K., Sudatha, I. G. W., Sukmana, A. I. W. I. Y., & Susiani, K. (2024). Student engagement and academic achievement: The effect of gamification on case and project-based online learning. *Journal of Education and Learning (EduLearn)*, *18*(3), 976–990. https://doi.org/10.11591/edulearn.v18i3.21349

Taşkın, N., & Kılıç Çakmak, E. (2023). Effects of Gamification on Behavioral and Cognitive Engagement of Students in the Online Learning Environment. *International Journal of Human–Computer Interaction*, *39*(17), 3334–3345. https://doi.org/10.1080/10447318.2022.2096190

Temel, T., & Cesur, K. (2024). The Effect of Gamification with Web 2.0 Tools on EFL Learners' Motivation and Academic Achievement in Online Learning Environments. *Sage Open*, *14*(2), 21582440241247928. https://doi.org/10.1177/21582440241247928

Tsarev, R., Roncevic, I., Potekhina, E., Aljarbouh, A., Nikolaeva, I., & Muracova, N. (2025). Gamification of E-Learning Through Kahoot! To Improve Students' Academic Performance. In R. Silhavy & P. Silhavy (Eds.), *Artificial Intelligence and System Engineering* (pp. 397–405). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-96759-7_29

Zhang, Q., & Yu, Z. (2022). Meta-Analysis on Investigating and Comparing the Effects on Learning Achievement and Motivation for Gamification and Game-Based Learning. *Education Research International*, *2022*(1), 1519880. https://doi.org/10.1155/2022/1519880