Jurnal Teknologi Pendidikan:
Jurnal Penelitian dan Pengembangan Pembelajaran
https://e-journal.undikma.ac.id/index.php/jtp/index

April 2026 Vol. 11 No. 2
E-ISSN: 2656-1417
P-ISSN: 2503-0602
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Implementation Strategies of Gamification in Elementary School : A Systematic Literature Review

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Abstract : Elementary school learning often faces problems related to low attention, weak learning motivation, and limited active participation during classroom activities. These issues commonly arise from teacher-centered instruction and a lack of varied learning experiences. One approach considered to address these problems is gamification, which integrates game elements into learning activities to increase student engagement. This study aims to identify the forms of gamification used in elementary school learning and analyze implementation strategies based on previous empirical studies. The research employed a Systematic Literature Review method by reviewing eleven selected articles from the Scopus and Taylor & Francis Online databases, published between 2020 and 2025, written in English, and available in full-text format. Data analysis was conducted through narrative synthesis. The findings show that gamification is implemented through digital learning platforms, interactive physical tools, and narrative-based classroom activities. Common implementation strategies include designing learning tasks in progressive levels, providing rewards, giving instant feedback, and using stories or characters to contextualize learning materials. The study concludes that gamification has the potential to improve student motivation and participation when game elements are planned systematically and aligned with learning objectives.

Article History
Received: 09-12-2025
Published: 14-04-2026

Key Words
elementary school, gamification, learning strategy, systematic literature review.

How to Cite: Yunita, S., Munir, Syawalahayati, S., & Aryanti, N. S. M. (2026). Implementation Strategies of Gamification in Elementary School Learning: A Systematic Literature Review. *Jurnal Teknologi Pendidikan : Jurnal Penelitian Dan Pengembangan Pembelajaran*, *11*(2), 258–269. https://doi.org/10.33394/jtp.v11i2.18732

https://doi.org/10.33394/jtp.v11i2.18732

Introduction

Advances in digital technology have significantly transformed education, including at the elementary school level. Students who are familiar with digital devices and interactive applications tend to require more engaging, dynamic, and visually oriented learning experiences. Therefore, traditional one-way instruction is no longer sufficient to maintain students' attention and motivation, highlighting the need for more innovative and interactive learning approaches such as gamification (Sari & Alfiyan, 2023). Previous studies also indicate that gamification can improve students' learning interest and literacy across various educational contexts (Husen, 2025).

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Gamification integrates game elements such as points, levels, badges, and challenges into learning activities to enhance motivation and engagement. These elements can create positive learning experiences and encourage active participation, particularly in elementary school contexts where play is an essential part of learning (Srimuliyani, 2024). This is particularly important at the elementary school level, where play is integral to children's development and serves as an effective learning medium.

In addition to boosting motivation, gamification also contributes to the development of higher-order thinking skills. Through tiered challenges, point systems, and game scenarios, students are encouraged to solve problems, identify patterns, make decisions, and refine their strategies. These elements align strongly with the development of computational thinking skills he ability to systematically break down problems and seek logical solutions (Wijayanti et al., 2025). Gamification serves not only as a recreational tool for children but also as a pedagogical tool that supports the strengthening of the cognitive skills students need in the 21st century.

Gamification can also enhance students' digital literacy through the use of apps, digital quizzes, platform-based challenges, and collaborative activities that leverage technology. Research shows that game elements such as points, avatars, badges, and leaderboards help improve students' ability to navigate digital media, understand information, and use technology creatively and responsibly (Al Hafidz et al., 2025; Mastoah, et al., 2022). In today's digital age, these skills are essential for elementary school students to navigate technology-driven social and academic changes.

Gamification has also proven effective in fostering a positive learning environment. Research by Rahim (2025) indicates that elements such as challenges, tokens, and leaderboards can boost students' intrinsic motivation, making them more enthusiastic and active in their learning. Teachers also noted that gamification helps liven up the classroom atmosphere, facilitates monitoring of student progress, and encourages collaboration among students. This suggests that gamification can serve as a bridge between students' emotional need to play and the learning objectives teachers aim to achieve (Wala, 2025).

However, the success of gamification hinges on the right implementation strategy. Without careful planning, gamification will merely become a "playful" activity that does not support learning objectives. Challenges such as a lack of technological tools, teachers' limited understanding of gamification design, the risk of unhealthy competition among students, and the potential for distraction due to excessive visual elements must be taken seriously (Rahim et al., 2025). This aligns with research conducted by Tiwa (2020), which emphasizes that gamification implementation must consider the appropriateness of the material, student needs, and a balance between competencies and collaboration to ensure learning remains focused on developing students' abilities, not merely on earning rewards.

On the other hand, the application of gamification also has the potential to support deep learning in elementary schools. Game elements such as reflective challenges, gradual progression, and immediate feedback can encourage students not only to understand concepts but also to connect them to their own experiences and thought processes. Gamification can

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foster meaningful, mindful, and joyful learning three key characteristics that serve as indicators of successful deep learning in elementary schools (Rahmawati, 2025).

Although various studies have examined the application of gamification in education, most of them still focus on implementation within specific contexts, the use of specific platforms, or the measurement of learning outcomes in isolation. Furthermore, existing literature reviews generally discuss gamification in the broader context of education without specifically and comprehensively highlighting its forms and implementation strategies at the elementary school level.

On the other hand, existing studies tend to emphasize the effectiveness of gamification but have not yet thoroughly examined how variations in game elements and implementation strategies influence the learning process in elementary schools. This indicates a research gap, particularly regarding the need for a structured synthesis focused on gamification implementation strategies within the context of elementary education.

This study aims to address this gap through a Systematic Literature Review of articles published between 2020 and 2025. This study specifically identifies forms of gamification and analyzes strategies for its implementation in elementary school learning. This study contributes as an updated Systematic Literature Review (SLR) as well as a strategic synthesis that can enrich educational technology research and serve as a practical reference for teachers in designing gamification-based learning in elementary schools

Research Method

This study employs a Systematic Literature Review (SLR) approach to identify, evaluate, and synthesize research findings regarding gamification implementation strategies in elementary school learning. This method was chosen to ensure that the literature review proceeds in a focused and transparent manner through the stages of planning, searching, selection, and synthesis. This study was designed to answer two main questions: (1) what forms of gamification are used in elementary school learning, and (2) what gamification implementation strategies are used in elementary school learning.

A systematic literature search was conducted in two reputable international databases, namely Scopus and Taylor & Francis Online, using keywords such as “gamification strategy,” “gamification in education,” and “elementary school,” combined with the Boolean operator (AND) to ensure focused results. The search was limited to English-language articles published between 2020 and 2025, available in full-text format, and classified as scholarly articles. The inclusion criteria required that studies focus on the implementation of gamification in elementary school contexts and employ empirical research designs such as experimental, quasi experimental, mixed method, or case studies, while conceptual and non empirical articles were excluded. In terms of context, only studies explicitly conducted in primary education settings were included. Additionally, the selected articles were published in peer-reviewed journals indexed in reputable databases such as Scopus and Taylor & Francis Online; although journal quartiles (e.g., Q1 or Q2) were not used as strict exclusion criteria, priority was given to reputable and indexed publications to ensure academic quality.

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Articles that were not relevant to gamification, did not focus on elementary education, or were not available in full text were excluded from the analysis.

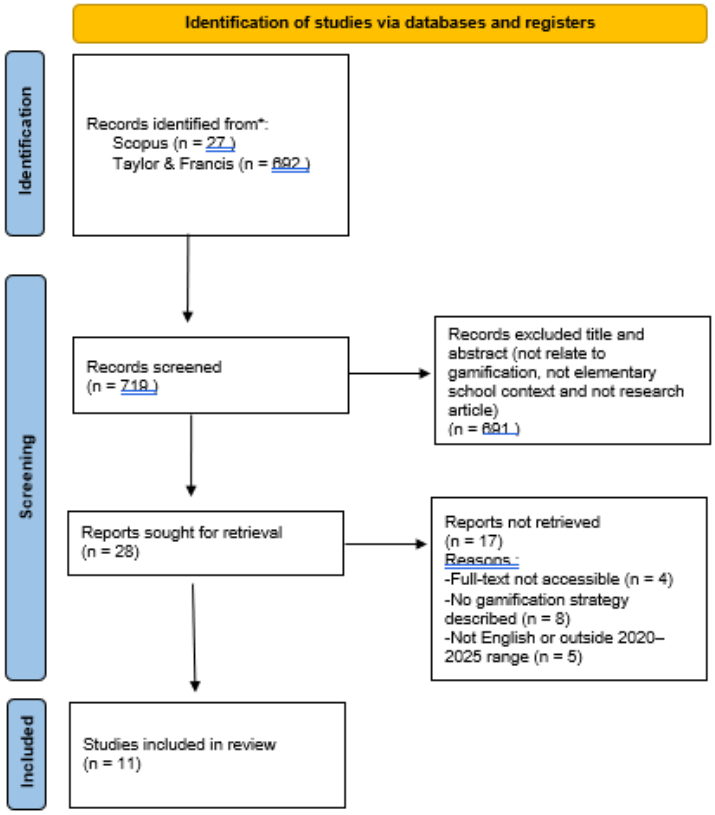

Figure 1. PRISMA flow diagram

An initial search of the Scopus database yielded 27 articles, and after filtering based on year, publication type, topic relevance, and full-text availability, 8 articles were found to meet the criteria. In the Taylor & Francis database, the initial search yielded 692 articles, and after undergoing the same selection process, 3 articles were identified as suitable for analysis, bringing the total to 11 articles used in this study. All selected articles were systematically extracted to obtain information regarding the study's identity, country of study, methods used, research objectives, forms of gamification, implementation strategies, and key study findings.

Data analysis was conducted using a thematic narrative synthesis approach, in which the findings of the selected articles were systematically organized and analyzed based on the focus of the research questions. The analysis process involved several stages, including coding key information from each study, categorizing the data into themes related to forms of gamification and implementation strategies, and identifying patterns across studies to reveal similarities and differences in findings. Through this process, recurring trends and relationships were synthesized to develop a comprehensive understanding of how gamification is implemented in elementary school contexts. This approach was chosen

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because it aligns with the characteristics of qualitative data and allows for in-depth interpretation, enabling the researcher to not only summarize the findings but also critically integrate them into a structured framework of effective gamification strategies.

Result and Discussion

Result

The table below presents a summary of the main findings from the eleven articles that served as data sources for this study. Each article is identified by its author, research context, objectives, methods, gamification strategies applied, and results obtained. The table summarizes the main findings of the selected studies of the variety of gamification approaches used at the elementary school level, in terms of activity types, instructional design, and media utilized. The table below illustrates general patterns of gamification implementation, differences in research focus, and trends in strategies considered effective in enhancing student engagement and learning outcomes.

Tabel 1. Article Data on the Use of Gamification in Elementary School Education

Author & Tit	Nation	Research Objective	Method	Gamification Strategy	Result
Cordeiro, S., & Abdulrahim, R. (2021). Using a web-based multilingual gamified platform to support refugee students in mathematics.	Canada	Examining the role of a multilingual gamification platform in improving elementary school refugee students' understanding of mathematics.	Mixed-methods, 77 students, pre–post test, observation, interviews.	Points, badges, avatars, levels, progressive quizzes, real-time feedback, language options, personalized learning pace.	Engagement increased, anxiety about learning math decreased, and interest in math became more positive
Gómez Niño, J. R., Árias Delgado, L. P., Chiappe, A., & Ortega González, E. (2025). *Gamifying learning with AI: A pathway to 21st-century skills.*	Global	Exploring how AI-based gamification enhances 21st-century skills.	SLR, 175 international articles	Points, badges, leaderboards, levels, missions, game narrative, AI personalizatio n, automatic feedback.	The integration of gamification and AI enhances creativity, collaboration, and problem-solving.
Downie, S.,	United	Assessing the	Program	Beanstack	Increased

& Proulx, S. (2022). Investigating the role of gamification in literacy-centered youth programming	State of America	impact of gamification on student participation in reading literacy in elementary schools.	content survey and analysis	app: points, daily challenges, reading badges, progress tracking, interactive narration.	interest in reading, higher completion rates for literacy assignments.
Hoskins, K., Lebbakhar, A., & Watts, M. (2024). "It hooks them in": Leveraging game culture for learning in the Key Stage 2 science curriculum	England	Examining how gaming culture enhances student engagement in elementary school science	Mixed-methods, 5 teacher & 102 student.	Game narrative (Sonic character), story-based challenges, game visuals as a scientific context	Students' focus has improved, and their understanding of the concept of classifying living things has improved.
Zhang, Z., & Huang, X. (2024). Exploring the impact of adaptive gamified assessment on learners in blended learning.	China	Examining the Impact of Gamified Adaptive Assessments on Motivation and Anxiety in Learning	Experiment, 45 elementary school students.	Adaptive Quizizz: automatic scoring, level up/down, virtual rewards, instant feedback.	Test scores have improved, academic anxiety has decreased, and motivation remains stable.
Ohashi, S., Urao, Y., Fujiwara, K., Koshiba, T., Ishikawa, S.-i., & Shimizu, E. (2025). A school-setting pilot study of the e-learning version of "Journey of the Brave"	Japan	Evaluating the effectiveness of a CBT gamification program for preventing anxiety in students.	Pilot study, 180 student.	Mini-missions, level progression, points, unlocking items, visual rewards.	Anxiety decreases, understanding of CBT increases, and students enjoy learning.
Ženatý, E.,	Czech	Evaluating		Quest system,	Post-test scores

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Dosedla, M., Picka, K., & Šťastná, J. (2024). Didactic game based on Unreal Engine and the effectiveness of its implementation in mathematics education	Republic	the effectiveness of 3D games in elementary school fraction lessons		virtual city, NPC missions, level cap, rewards per task	increased significantly, and student engagement was high
Kliziene, I., Sinkeviciene, G., Cizauskas, G., & Augustiniene, A. (2024). The impact of gamification on achievement in mathematics among primary school pupils with hearing impairment.	Uni Arab Emirates	Examining the Effect of Multisensory Gamification on the Mathematics Learning Outcomes of Deaf Elementary School Students.	Experiment, 26 siswa.	BeeBot robots, Bamboozle game, digital escape room, multi-level puzzles..	Scores have increased significantly, and mathematical communication skills have improved.
Wibowo, C. (2024). Enhancing self-esteem, satisfaction, and motor skills through gamification in elementary physical education	Indonesian	The implementation of this approach in physical education classes has an impact on elementary school students' self-esteem, levels of learning satisfaction,	The pre-experimental study involved 90 elementary school students	Physical challenges, team competitions, tag games, coordination games, and motor skills challenges.	Significant improvements in students' self-esteem, learning satisfaction, and motor skills

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		and the development of their motor skills.			
Bhakti, Y. B., Astuti, I. A. D., Okyranida, I. Y., Prasetya, R., Maryani, I., & Nizaar, M. (2025). Twenty-first century learning technology innovation: Teachers' perceptions of gamification in science education in elementary schools.	Indonesian	An Exploration of Teachers' Perceptions of Gamification in Science Education.	A mixed-methods study involving 34 elementary school teachers. Data were collected through questionnaires and in-depth interviews	Elements such as points, badges, leaderboards, level progression, instant feedback, and challenge-based activities	Improving students' motivation, participation, and understanding in science
Valentová, M., & Brečka, P. (2023). Assessment of digital games in technology education.	Slovakia	Evaluating the effectiveness of ten digital games used in technology education	The case study involved 46 elementary school students	The game features built-in elements such as 3D simulation, exploratory environments, progressively challenging technical tasks, visual feedback that immediately highlights errors, and problem-based scenarios	Enhancing students' creativity, understanding of technological concepts, and active participation in learning

Based on Table 1, it is evident that the most prevalent gamification strategies used in elementary school education are reward- and level-based strategies, which appear in the majority of studies. These strategies are generally employed to enhance student motivation

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and engagement through a system of incremental achievements. On the other hand, adaptive feedback strategies play a significant role in helping students understand their mistakes and continuously improve their academic performance. Meanwhile, narrative-based strategies tend to be used to foster emotional engagement and boost students' interest in learning. This shows that effective gamification implementation does not rely on a single strategy but on a combination of complementary strategies tailored to learning objectives and student characteristics

Discussion

Forms of Gamification in Elementary School

The results of the analysis indicate gamification in elementary school learning is generally implemented through three main forms: digital platforms, physical or activity-based tools, and narrative-based approaches. Digital gamification is commonly applied through educational applications that incorporate elements such as points, levels, badges, leaderboards, and instant feedback, enabling adaptive and self-paced learning experiences (Liu et al., 2024; Cordeiro & Abdulrahim, 2021; Navratil et al., 2023)..

In addition to digital platforms, gamification can also be implemented through physical tools and activity-based learning. The use of interactive devices, physical challenges, and collaborative games allows students to engage in multisensory learning experiences that enhance participation, confidence, and motor skills (Al-Naqbi et al., 2024; Cahyo et al., 2024). This shows that gamification does not always depend on digital technology, but can be adapted to various classroom conditions.

Narrative-based gamification also plays an important role in increasing students' engagement. The integration of stories, characters, and mission-based learning helps students connect learning materials with familiar experiences, making learning more meaningful and contextual (Smith et al., 2024; Ohashi et al., 2024)..

Overall, these shows that effective gamification does not rely on a single form, but on the integration of challenges, rewards, and feedback across different learning contexts. The effectiveness of gamification is therefore determined not by the complexity of the tools used, but by how well game elements are aligned with learning objectives and student characteristics.

Strategies for Implementing Gamification in Elementary School

Based on a synthesis of the selected studies, gamification implementation in elementary school learning is generally reflected in four main strategies: level-based task design, reward systems, adaptive feedback, and narrative integration. These strategies function as complementary components that structure learning while maintaining student engagement.

The level-based strategy enables students to complete tasks progressively, allowing them to clearly perceive their learning progress and maintain motivation. This strategy is effective when task difficulty is aligned with students' abilities; however, it becomes less

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effective when levels are not proportionally designed, as overly easy tasks reduce challenge while overly difficult tasks may cause frustration (Beranek et al., 2024; Bhakti et al., 2024)..

Reward systems are widely used to enhance initial motivation and participation through elements such as points, badges, and leaderboards. These rewards can strengthen students' confidence and engagement, particularly in the early stages of learning (Liu et al., 2024; Cordeiro & Abdulrahim, 2021; Dewi et al., 2025). However, excessive reliance on rewards may shift students' focus toward outcomes rather than understanding, potentially weakening intrinsic motivation. Therefore, rewards should be used proportionally as a stimulus rather than the primary goal of learning.

Adaptive feedback plays a critical role in supporting students' learning processes by providing immediate and specific information about their performance. Studies show that timely feedback helps reduce learning anxiety and supports continuous improvement (Zhang et al., 2024; Valentová et al., 2023). This strategy is most effective when feedback is clear and actionable, but less effective when it is too general or lacks guidance. The effectiveness of feedback is thus determined not only by its speed but also by its quality and relevance.

Narrative-based strategies emphasize emotional engagement through the use of stories, characters, and mission-based learning. These approaches help students connect learning materials with familiar experiences, making learning more meaningful and engaging (Smith et al., 2024; Ohashi et al., 2024). However, narrative strategies alone are insufficient to ensure academic achievement if not supported by clear assessment structures. Therefore, they need to be integrated with other strategies such as levels and feedback to produce optimal learning outcomes.

Overall, the effectiveness of gamification strategies depends not on individual elements, but on how these strategies are combined and aligned with learning objectives and student characteristics. Well-designed gamification integrates motivational, cognitive, and emotional aspects, making learning both engaging and meaningful..

Conclusion

This study confirms that gamification is a relevant and effective approach for elementary school learning, particularly in enhancing student motivation, engagement, and conceptual understanding. The findings indicate that gamification is commonly implemented through digital platforms, physical activities, and narrative-based approaches, supported by key elements such as points, levels, challenges, and feedback.

The synthesis also highlights four main implementation strategies: level-based task design, reward systems, adaptive feedback, and narrative integration. These strategies are most effective when applied in a balanced and structured manner, aligned with learning objectives and student characteristics.

Theoretically, this study reinforces gamification as a pedagogical approach that integrates motivational, cognitive, and emotional aspects within structured instructional design. Practically, the findings provide guidance for elementary school teachers to design gamification-based learning by selecting appropriate strategies, using rewards proportionally, and providing meaningful feedback to support deeper learning outcomes.

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Suggestion

Further research is recommended to explore gamification across different subjects and contexts using experimental or mixed-methods designs, as well as to develop valid instruments for measuring student engagement and motivation. Developing specific evaluation instruments to measure student engagement and motivation in gamification-based learning is also crucial to ensure that the resulting empirical findings are more valid and can serve as a reference for gamification-based learning practices at the elementary school level.

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