

RESEARCH DESIGNS AND THEORETICAL FRAMEWORKS OF GAMIFICATION IN EDUCATIONAL CONTEXT: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

This systematic literature review looks at how gamification strategies are being used in education that focuses on the trends in research designs and the theories used in educational gamification studies, given the limited synthesis regarding these two aspects. The analysis covers 16 research articles published from 2020 to 2025. Information was gathered from Google Scholar and ERIC by using specific rules to decide either data inclusion or exclusion, and then it was examined through a process called thematic synthesis. The results show that most research on gamification uses quantitative and quasi-experimental designs, while mixed-methods and qualitative approaches are used less often. Additionally, the review shows that several studies use gamification but don't clearly base their methods on recognized learning or motivation theories. However, some studies do mention Self-Determination Theory and ideas related to active learning. Overall, the synthesized evidence indicates that gamification enhances motivation, engagement, and learning outcomes. However, future studies should use more theory-based approaches and different methods to make their findings more reliable and relevant to teaching.

Keywords: Educational Context, Gamification, Strategy, Systematic Literature Review

INTRODUCTION

The learning atmosphere requires brilliant notions to keep the learning activities more fun and enjoyable for the students in the classroom presently. The primary objective is how to enhance the students' enthusiasm and engagement in order to create the pleasant atmosphere in learning and teaching process. As a result, it can afford a benefit to improve the students' performance in educational classroom context. The lecturers have to think hard a sustainable innovation regarding with the strategy to teach in the learning process therefore the students have a big enthusiasm and engagement in the classroom. Besides,

the students can focus on the learning and understand the materials well with the aim that the students are able to improve their learning performance. One of all ways to bring into reality is guiding the students in learning by playing or playing by learning.

Playing is a mental and physical activity which are important for the individual large or small because of the contribution to the formation of his personality in all aspects: mental, cultural, emotional, moral and linguistic skill, as it meet various needs such as: education, recreation, emptying excess energy, evolving his thinking and it helps him to adapt in different environments by training in social role-playing and helps him to control his emotions and stress. Besides, the individual has a different importance from one category to another either individually or collectively organized or automatically. Educational games help the students to grow due to the advantages and excitements that provoke enthusiasm and positive attitudes toward them. It also provides a fertile environment and urges active interaction with the learning material which makes the individual attracted to the game and seeks to deal with it in an enjoyable and entertaining way to achieve the goals of the scientific subject emotional, skilled, and cognitive, (Landers & Armstrong, 2017). Therefore, to create the enjoyable learning atmosphere in learning process requires an innovative strategy such as employing the strategy of content gamification.

The concept of gamification has spread to many areas of human activity such as education, health, business, information and communication technology, family activities and so forth. Gamification is the use of game elements in a non-gaming environment. As Caponetto et al. (2014) explains, gamification involves the integration of elements typically found in games into non-gaming contexts to influence behaviour, increase motivation, and encourage greater participation. Besides, Hashim et al. (2019) emphasize that students' interest in playing games positively impacts their self-esteem and confidence in learning grammar. It's similar with Cruz, (2020) asserts that the incorporation of new game elements facilitates students' self-evaluation and autonomy, enabling them to cultivate a more profound understanding of the learning process. A good understanding of learning is derived from a high enthusiasm of the students to the process of learning.

A game refers to a structured play with rules, goals and challenges for the purpose of entertainment (Su & Cheng, 2015). The term gamification first emerged in 2008 and gained increasing relevance since the 2010s (Deterding et al., 2011); (Seaborn & Fels, 2015). In contrast to games, gamification is characterized by its serious purpose. Definitions of gamification vary and usually focus either on game elements and mechanic

or the process of gaming and gamefic experiences in serious contexts. Deterding et al. (2011, p 15) define gamification as the “use of game elements in non-game contexts”. Game elements are, for example, levels, points, badges, leader boards, avatars, quests, social graphs, or certificates (Zainuddin et al., 2020). Zichermann & Cunningham, (2011, p. xiv) denote gamification as “the process of game-thinking and game mechanics to engage and solve problems”. Synthesizing these different perspectives, Seaborn and Fels (2015) state a possible standard definition, namely gamification as “the intentional use of game elements for a gamefic experience of non-game tasks and contexts” (Seaborn & Fels, 2015, p. 17)

The growing number of empirical studies on gamification in education, the existing body of literature remains fragmented. Most studies primarily investigate the effectiveness of gamification interventions in improving learning outcomes, while relatively little attention has been given to synthesizing how gamification research itself has been conducted. There is a lack of comprehensive reviews that systematically examine the methodological characteristics of gamification studies, including the research designs employed, the theoretical frameworks underpinning the investigations, and the overall trends that have shaped the field. This methodological gap limits researchers' ability to identify dominant research patterns, theoretical foundations, and underexplored areas that could guide future investigations. Therefore, the research questions to fill those gaps are as follow: What research design are mostly adopted in gamification strategy in educational context? and what are the theories mostly used in the literatures dealing with gamification strategy in educational context?.

RESEARCH METHOD

The systematic literature review (SLR) method is employed by the writers to critically observe and analyse the existing article of gamification strategy in Educational Context. The systematic review guidelines by (Kitchenham, 2007), and updated by (Snyder, 2019) are followed by the writers. The systematic literature review process is reproducible, clear, and thorough, to ensure the all-relevant literatures is included. Three steps in this process such as planning, conducting, and reporting. It was outline by (Tanfield et al., 2003). In the planning stage, the research questions were observed to fill the gaps identified in gamification strategy article in educational context. For the conducting stage, the writers search for the databases systematically in ERIC, with the keyword gamification strategy. The analysis utilized thematic synthesis methods highlighted by (Thomas & Harden,

2008), allowing for the discovery of gamification research design trends and theoretical frameworks of gamification strategy in educational context. To improve transparency, the review process adapted and summarized in a table format. Besides, the researcher created inclusion and exclusion criteria for selecting journals to be analysed. Data inclusion means that the researcher uses the data in research. Meanwhile, data exclusion means that the researcher does not use the data. As for the selection of journals, researchers made several criteria as follows.

Table 1. Data Inclusion and Exclusion

No.	Inclusion	Exclusion
1.	The study employs empirical research methods such as qualitative, quantitative and mix-method design	The study doesn't employ empirical research methods such as qualitative, quantitative and mix-method design
2.	The study is published within the selected review period 2020 -2025	The study is not published within the selected review period 2020-2025
3.	The study is written in English only open access journals	The study is not written in English and is not open access journals
4.	The study explicitly or implicitly discusses pedagogical practice in educational context	The study doesn't explicitly or implicitly discuss pedagogical practice in educational context
5.	The study focuses on gamification in educational context	The study doesn't focus on gamification in educational context

Table 2. The Spreading of the Data

The Number of Sources		269
No.	Inclusion	
1.	The study employs empirical research methods such as qualitative, quantitative and mix-method design	269
2.	The study is published within the selected review period 2020-2025	198
3.	The study is written in English only open access journals	57
4.	The study explicitly or implicitly discusses pedagogical practice in educational context	25
5.	The study focuses on gamification in educational context	16

Based on these inclusion criteria, the researchers sorted the articles. The researchers selected articles related to gamification strategy keyword. The article screening process is summarized in Table 2, yielding 16 primary articles for analysis. To answer the research questions, selected articles were analysed using a template to collect data. In creating a template, the researchers grouped it into several points, including the author and year, research design, theory, and outcomes or key findings. The template was made based on the needs according to the research questions. It is to answer the research questions mentioned in the background.

FINDINGS

This section presents the findings based on thematic synthesis of the 16 selected empirical studies addressing gamification strategies in educational contexts. The sixteen studies analyzed were predominantly published between 2020 and 2025 and set within higher education contexts, with the categorization of designs and theories based on the authors' explicit statements in the methods and theoretical framework sections of each article. The empirical studies are presented below:

Table 3. Summary of Included Studies (N = 16)

No	Author/Year	Design	Theory	Outcome
1	(Ibrahim, 2020)	Quasi-experimental	Not explicit	Significant improvement in achievement & attitude
2	(Limantara et al., 2023)	Applied research	None	Developed gamification model
3	(Huseinović, 2023)	Quantitative	SLA-related (implicit)	Positive impact on motivation & EFL skills
4	(Bitrián et al., 2023)	Applied research	None	Improved attitudes toward e-training
5	(Torres Rodríguez et al., 2023)	Mixed-method	None	Listening improved (50% - 80%)
6	(Pardim et al., 2023)	Quantitative	None	Competition strongly affects engagement
7	(Alsadoon, 2023)	Quasi-experimental	SDT	Increased motivation & engagement
8	(Palaniappan & Noor, 2022)	Pre-experimental	None	Supports self-directed learning

9	(Gortaire Díaz et al., 2022)	Mixed/Case study	None	Vocabulary learning improvement
10	(Lluch-Molins et al., 2022)	Case study	None	Increased motivation & teamwork
11	(Lopes et al., 2024)	Experimental	Design Thinking, Octalysis	Low engagement & mixed results
12	(Rincon-Flores et al., 2022)	Mixed-method	None	Weak emotion-performance correlation
13	(Pehlivan & Arabacioglu, 2023)	Quasi-experimental	Flipped Classroom	No significant achievement gain
14	(García-López et al., 2023)	Quantitative	SDT	Strong effect on motivation
15	(Huesca et al., 2023)	Quantitative	None	Positive for post-pandemic learning
16	(Hellín et al., 2023)	Mixed-method	None	Increased participation & confidence

1. Research Designs Trends in Gamification Studies

Looking at the studies chosen, it's clear that most research on gamification uses quantitative metrics and qualitative narratives. Among the 16 studies, most used types of research methods that were either quasi-experimental, pre-experimental, or purely quantitative. Some examples of these studies include those by Huseinovic (2023), Alsadoon (2023), García-López, et al. (2023), and Palaniappan (2022). These designs were often used to assess things like motivation, engagement, achievement, and academic performance by using tests and surveys. Many studies used mixed-methods approaches, which means they combined numbers and stories to understand both what students learned and how they felt about it (for example, (Torres Rodríguez et al., 2023); (Rincon-Flores et al., 2022); (Hellín et al., 2023)). Still, the amount of these kinds of studies is small when you compare it to research that is only about numbers. Only a few studies used qualitative or case study methods, like the one by (Gortaire Díaz et al., 2022), which looked into how gamification helps with learning vocabulary by using exploratory and descriptive techniques. This shows that there is still not enough detailed study of how gamification works and how things go in the classroom. The results show that there is a strong preference for research designs that focus on outcomes, while there is less attention given

to studies that look at processes or follow changes over time through qualitative methods.

2. Theoretical Frameworks Used in Gamification Studies

When it comes to theoretical foundations, the results indicate that the clear use of theory varies between different studies. 11 out of 16 articles did not clearly explain the theoretical framework they were based on, even though they used gamification strategies (for example, (Limantara et al., 2023); (Pardim et al., 2023); (Palaniappan & Noor, 2022); (Lluch-Molins et al., 2022)). In research that clearly mentioned a theory, Self-Determination Theory (SDT) was the framework that was used the most often ((Alsadoon, 2023); (García-López et al., 2023)). These studies highlighted the importance of autonomy, competence, and relatedness as essential factors that help gamification boost motivation and engagement. Other research included ideas about active learning, like Flipped Classroom models ((Pehlivan & Arabacioglu, 2023); (Huesca et al., 2023)), and design-focused methods, such as Design Thinking and the Octalysis Framework ((Lopes et al., 2024)). One of studies is implicitly stating the theory used such as SLA-related theory. However, these frameworks were used in an uneven way and often without a thorough connection to the underlying theories. The results show a clear difference between how gamification is used in real life and how it is based on educational theory. This indicates that gamification is often seen as just a method instead of a teaching approach that is based on solid educational principles.

DISCUSSION

The findings of this review highlight two major trends in gamification research within educational contexts.

Researchers mainly use quantitative and quasi-experimental designs because they are very interested in measuring how well gamification works, especially regarding motivation, engagement, and academic performance. This matches the common belief that gamification is a way to help enhance specific learning results. But this way of doing things also makes it harder to really understand how and why gamification is effective in various learning environments. The rare use of qualitative and long-term studies indicates that we still have not fully looked into learner experiences, teaching methods, and the factors related to the context. Secondly, the analysis shows that many studies on gamification do not have a solid and consistent theoretical basis. Even though gamification is closely connected to ideas about motivation and learning, many studies have used game features without clearly tying them to well-known theories. When theories were used, Self-Determination Theory was especially important because it clearly shows how gamification

helps boost learners' inner motivation by giving them freedom, skills, and chances to interact with others. These findings are generally consistent with previous systematic literature reviews, which also reported the predominance of quantitative and experimental research designs in gamification studies while identifying a relative scarcity of qualitative investigations and theoretically grounded research. Nevertheless, the present review extends these earlier syntheses by incorporating more recent studies, providing an updated picture of methodological and theoretical developments in the field.

Not all studies showed the same positive results interestingly. For instance, Lopes et al. (2024) and Pehlivan & Arabacioglu, (2023) found that gamification had either small or varying effects on how well people did and how motivated they felt. This implies that just using gamification doesn't ensure better learning results. These results highlight how important it is to have good instructional design, ensure that the learning context fits well, and maintain a clear theoretical foundation in learning environments that use gamification. This issue becomes even more important in technology-enhanced learning environments where gamification is commonly integrated with interactive multimedia elements, such as videos, animations, simulations, quizzes, and instant feedback. Although these multimedia components can make learning experiences more engaging, their educational value does not stem from the technology itself but from how they are pedagogically designed and aligned with learning objectives. Likewise, game mechanics including points, badges, leaderboards, levels, and challenges cannot independently promote meaningful learning unless they are embedded within a well-structured instructional design. Sound instructional design determines how multimedia content is sequenced, how learner interaction is facilitated, how feedback is provided, and how game elements reinforce rather than distract from the intended learning outcomes. Without this pedagogical alignment, multimedia may increase learners' cognitive load, while game mechanics may encourage superficial participation instead of deeper cognitive engagement.

In order to promote motivation, engagement, and learning, gamified learning environments must be firmly grounded in educational and psychological theories that clarify how instructional tactics, multimedia resources, and game mechanics interact. Overall, the discussion demonstrates that future studies on gamification should do more than simply assess its efficacy. To provide more robust and broadly applicable insights, it should concentrate on applying various theories, a range of techniques, and the particular context. This review highlights a significant issue: many studies lack a well-defined theory, which has significant implications. It is more difficult for gamification research to

adequately explain its findings in the lack of a strong theoretical underpinning, which results in inconsistent findings across different studies. When Researchers frequently employ gamification with simple elements like points, medals, and leaderboards when they lack a clear framework to adhere to. They lose out on employing more in-depth techniques that are grounded on teaching or psychological concepts.

Because they provide a clear connection between game elements and concepts like independence, skill, and interpersonal connection, studies based on theories particularly those employing Self-Determination Theory (SDT) show more trustworthy results. However, studies without a coherent framework can yield inconsistent or insignificant findings (see, for instance, Lopes et al., 2024; Pehlivan & Arabacioglu, 2023). This suggests that gamification alone does not always improve learning outcomes. The lack of design based on particular mechanisms helps to explain this disparity. The rationale behind instructional strategies is explained by theory. It demonstrates how gamification influences learning and motivation as well as the circumstances in which it is most effective. Without it, gamification becomes a process of experimenting until something works, producing dispersed and useless outcomes that are not transferable to other contexts. Thus, theoretical alignment is essential to ensuring that gamification research is understandable, repeatable, and applicable to instruction.

Eventhough providing an updated synthesis of gamification research, this review has several limitations that should be acknowledged. First, the findings are limited to the studies included based on the predefined inclusion and exclusion criteria, meaning that relevant publications outside the selected databases, time frame, or language restrictions may not have been captured. Second, although the review systematically examined research designs and theoretical foundations, it did not conduct a meta-analysis to quantify the magnitude of gamification effects across studies. Consequently, the conclusions emphasize methodological and theoretical patterns rather than the overall effectiveness of gamification. Third, the reviewed studies were conducted across diverse educational levels, disciplines, and technological contexts, which introduces considerable heterogeneity and limits the generalizability of the findings

CONCLUSION

This review of existing literature looked at the types of research methods and theories used in recent studies about gamification strategies in education. The results show that most research on gamification mainly uses numbers and focuses on results, with many studies using a type of experiment that is not fully controlled. Although many reports say

that gamification can boost motivation, involvement, and some learning results, it is often not clearly based on well-known learning or motivation theories when it is put into practice. Self-Determination Theory is often mentioned as the main theory, but many research studies use gamification without a solid theoretical basis. Not having a clear theory that everyone agrees on might lead to different results in various studies. Given these findings, it is suggested that future studies should (1) use a mix of different research methods and focus on qualitative designs, (2) include gamification within clear theoretical frameworks, and (3) look into the long-term and situational impacts of gamification in various educational environments. These efforts are important to make sure that using games as a teaching method is effective and can last over time.

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