The Power of Play! A Review of Gamification Design Trends and Their Impact on Learning Outcomes

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Abstract: Digital transformation in education has accelerated the integration of gamification as an interactive and motivational learning strategy. This study presents a systematic literature review following the SPAR 4 SLR protocol, based on the analysis of 25 empirical research articles published between 2020 and 2025. The objective is to explore the distribution and impact of various gamification elements on cognitive, affective, and psychomotor learning domains. Elements that provide rewards, such as points (88%), badges (80%), and leaderboards (72%), were the most commonly applied in learning environments. In contrast, reflective features such as storytelling (20%), learner autonomy (24%), and role-playing activities (16%) were especially effective in increasing emotional involvement, self-directed learning, and practical abilities. Through thematic analysis using NVivo 12, the study found that external rewards often encourage only temporary motivation, whereas reflective components support more lasting and meaningful learning processes. The study concludes by recommending a balanced and goal-oriented approach to gamification design, which can strengthen its role as a transformative educational strategy in the digital learning era.

Abstrak: Transformasi digital dalam pendidikan telah mempercepat integrasi gamifikasi sebagai strategi pembelajaran interaktif dan motivasional. Studi ini menyajikan tinjauan literatur sistematis berdasarkan protokol SPAR 4 SLR, yang didasarkan pada analisis 25 artikel penelitian empiris yang diterbitkan antara tahun 2020 dan 2025. Tujuan utama adalah untuk mengeksplorasi distribusi dan dampak berbagai elemen gamifikasi pada domain pembelajaran kognitif, afektif, dan psikomotorik. Elemen yang memberikan reward, seperti poin (88%), badge (80%), dan papan peringkat (72%), merupakan elemen yang paling sering diterapkan dalam lingkungan pembelajaran. Di sisi lain, fitur reflektif seperti storytelling (20%), otonomi belajar (24%), dan aktivitas peran (16%) terbukti sangat efektif dalam meningkatkan keterlibatan emosional, pembelajaran mandiri, dan kemampuan praktis. Melalui analisis tematik menggunakan NVivo 12, studi ini menemukan bahwa hadiah eksternal seringkali hanya mendorong motivasi sementara, sedangkan komponen reflektif mendukung proses pembelajaran yang lebih berkelanjutan dan bermakna. Studi ini menyimpulkan dengan merekomendasikan pendekatan yang seimbang dan berorientasi pada tujuan dalam desain gamifikasi untuk memperkuat perannya sebagai strategi pendidikan transformatif di era pembelajaran digital.

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A. Introduction

The increasing digitization of education has brought fundamental transformations to how learning experiences are structured, delivered, and consumed. More than just a shift in technological platforms, this transformation reflects more profound pedagogical implications that redefine student interaction, engagement, and agency in digital learning environments. While online learning is praised for its accessibility and flexibility, it also presents significant drawbacks, particularly in sustaining student motivation and cognitive immersion. Research by Na & Han (2023) indicates that many digital platforms lack emotional depth and personal relevance, leading to reduced persistence and focus among learners. This issue is particularly pronounced in vocational education, where learners often expect hands-on, context-rich experiences that reflect the demands of authentic workplaces. Hellín et al (2023) emphasize that vocational students are likely to disengage when exposed to digital content that lacks real-life applications. Similarly, Huang et al (2023) argue that the absence of interactivity and real-world relevance in instructional design can lead to a passive learning experience that fails to foster deep understanding. These challenges underscore the urgency of developing learning strategies that go beyond digital replication of conventional instruction to create experiences that are immersive, personalized, and transformative.

One emerging strategy that addresses these challenges is gamification—the integration of game mechanics into educational contexts. As Christopoulos & Mystakidis (2023) explain, gamification introduces elements such as challenge, real-time feedback, symbolic rewards, and competitive dynamics to encourage active engagement. Its appeal lies in its ability to simulate the rewarding aspects of gameplay, making learning more engaging and goal-driven. Popular platforms like Kahoot!, Quizizz, and Classcraft exemplify this approach by using features such as points, badges, and leaderboards to provide immediate gratification and social recognition. Almutairi (2024) notes that these extrinsic motivators are effective in capturing students' attention and initiating participation, especially in asynchronous learning environments. However, such approaches often result in superficial engagement. Dong et al (2025) caution that relying solely on external rewards can produce compliance rather than commitment, where learners engage only to receive rewards without internalizing the content. Bai et al (2021) further found that single-layered leaderboard structures may create competitive stress, particularly among lower-performing students, leading to increased anxiety and disengagement. These findings suggest that while reward-based gamification can enhance short-term motivation, it does not necessarily foster sustained learning or conceptual growth.

To counter the limitations of extrinsic-based gamification, recent studies highlight the importance of integrating emotionally resonant and learner-driven elements into instructional design. These include immersive storytelling, learner autonomy, simulation-based tasks, and meaningful social interaction. Jarrah et al (2024), for example, found that narrative elements embedded within instructional content can enhance emotional engagement and deepen conceptual understanding, especially when stories are thematically aligned with learners' experiences. Similarly, Li et al (2024) demonstrate that offering

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learners autonomy to choose their learning pathways leads to improved self-regulation and higher motivation. Baah et al (2023) emphasize that decision-making opportunities cultivate a sense of ownership and accountability, making learning more personally meaningful. However, these benefits remain largely untapped. According to Oguta et al (2023), many educators are either unaware of or unprepared to implement such complex gamification strategies, often due to limited training in pedagogical design or unfamiliarity with adaptive technologies. This situation creates a noticeable gap between what research recommends and what is implemented in classrooms, signaling a need for more comprehensive frameworks that support the integration of deeper, more meaningful gamification elements.

This study aims to fill that gap by conducting a systematic literature review guided by the SPAR for SLR protocol, which was developed to enhance methodological transparency and analytical rigor (Sari & Prasetya, 2025). Unlike traditional reviews that only document gamification practices, this study examines how specific gamification elements align with various learning domains, specifically cognitive, affective, and psychomotor outcomes. Such classification responds to the call by Wood & Drew (2025), who argue that effective instructional strategies must be aligned with clearly defined educational goals. Ninaus et al (2023) support this view, noting that domain-based mapping of gamification features enables educators to design targeted, coherent, and measurable learning interventions. By adopting a domain-based lens, this study not only contributes to theoretical clarity but also provides practical guidance for educators seeking to tailor gamification strategies to specific competencies or learner profiles.

What distinguishes this study is its dual contribution: theoretical integration and methodological innovation. On the conceptual side, the study employs a unified framework drawn from Bloom's taxonomy for cognitive learning, Krathwohl's affective domain, and Simpson's psychomotor classification. This enables a nuanced analysis of how different game elements function within diverse pedagogical contexts. For example, while feedback and graded challenges are commonly linked to cognitive outcomes, such as recall and problem-solving (Husain et al., 2023), narrative and autonomy tend to influence affective outcomes, including emotional engagement and motivation (Allehaidan, 2025). Meanwhile, role-playing and simulation activities often contribute to psychomotor development, fostering skills such as collaboration and real-world application (Okariz et al., 2023). On the methodological side, this review leverages NVivo 12 to perform thematic coding and visualize inter-element relationships, a process that enhances interpretive depth and facilitates evidence-based synthesis. Rito (2025) argues that goal-aligned gamification is more than a trend; it is a pedagogical approach that transforms engagement into long-term learning benefits. Maghsoodi et al (2025) support this by demonstrating that underutilized elements, such as scenario-based role-playing, can enhance students' ethical awareness and decision-making skills when used deliberately.

In summary, this research aims to position gamification not as a decorative layer in digital learning, but as a strategic framework based on theory and driven by evidence. It provides educators, curriculum designers, and educational policymakers with practical

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insights for integrating gamification features in a way that is pedagogically sound and contextually meaningful. Rather than promoting generic or entertainment-focused designs, the study advocates for a more refined, goal-oriented approach that situates gamification within the broader framework of 21st-century competencies. This includes critical thinking, emotional intelligence, and collaborative problem solving, all of which are essential for success in both academic and professional fields. By bridging the gap between gamification theory and classroom application, the study contributes to the advancement of digital pedagogy and supports the development of engaging, reflective, and impactful learning environments.

B. Method

Research Design

This study employed a Systematic Literature Review (SLR) approach using the SPAR-4-SLR model, which comprises six systematic stages to ensure transparency and replicability. The SLR was utilized to examine gamification design trends and their relationship with learning outcomes, both thematically and based on empirical evidence across studies.

Figure 1. SPAR-4-SLR (Scientific Procedures and Rationales for Systematic Literature Reviews) adopted from Sari & Prasetya (2025), Prasetya et al (2025)

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Research Question

This study aims to identify gamification elements that are frequently and rarely used in educational contexts and map their contributions to cognitive, affective, and psychomotor learning outcome domains. The main questions answered in this study include:

1) What gamification elements are most commonly used in gamification-based educational studies?
2) Which gamification elements are rarely used but have a positive impact on learning outcomes?
3) How do specific gamification elements relate to specific learning outcome domains?

Literature Search Procedure

The literature search was conducted through four central databases: Scopus, Web of Science, SINTA, and Google Scholar. Keywords used included "gamification", "game elements", "learning outcomes", "education", and "digital learning", combined using Boolean AND and OR operators. Article selection followed the PRISMA flow, including identification, screening, eligibility, and inclusion stages, with a focus on empirical articles published between 2020 and 2025.

Table 1. Article Selection Process

Selection Stages	Number of Articles
Identification (Scopus & WoS)	520
After duplicate removal	472
Filtered by title & abstract	205
Full-text analyzed	75
Articles that met the inclusion criteria	25

Figure 2 below presents a flowchart of article selection based on the PRISMA protocol, illustrating the stages of article identification, screening, eligibility assessment, and inclusion for the final synthesis. This process was designed to ensure transparency, accountability, and validity in the conduct of systematic literature reviews.

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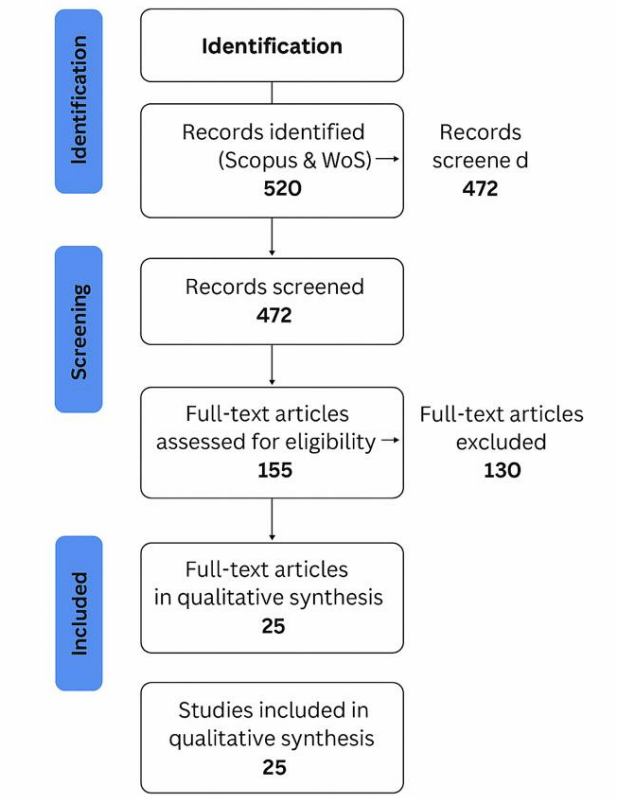

Figure 2. Article selection following the PRISMA flow adopted from Moher et al (2010), Tedja et al (2024), Page et al (2021), and Sohrabi et al (2021)

Inclusion and Exclusion Criteria

1) Inclusion criteria:
   a) Articles published between 2020 and 2025
   b) Written in English
   c) Study is empirical (quantitative, qualitative, or mixed-method)
   d) Focus on using gamification elements in education
   e) Mention the learning outcome domain explicitly
   f) Indexed in Scopus, Web of Science, SINTA, or Google Scholar

2) Exclusion criteria:
   a) Non-systematic review, opinion, or editorial articles
   b) Studies that do not explicitly mention gamification elements or learning outcomes
   c) Does not come from a valid indexed source

Study Quality Assessment

Quality assessment was conducted using the JBI Critical Appraisal Checklist instrument. Each article was assessed based on four aspects: the appropriateness of the

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objectives, the strength of the methodology, the clarity of the data and findings, and the alignment of the conclusions. Each aspect was scored on a scale of 1 to 4, with a maximum total of 16 points. Articles with a minimum score of 12 were considered eligible for further analysis.

Table 2. Study Quality Assessment Criteria (Likert Scale 1-4)

No.	Evaluation Criteria	Score 1 (Very Low)	Score 2 (Low)	Score 3 (High)	Score 4 (Very High)
1	Clarity of Research Objectives	The objective was not explained at all	Unspecific and vague objectives	Objectives are explained clearly enough	Objectives are described explicitly and sharply
2	Appropriateness of Methodology Design	No explanation of methodology	The methodology is described very generally	The methodology is explained well enough	Methodology is very detailed and fit for purpose
3	Data Availability and Quality	Data not available / not verified	Limited and sketchy data available	Data is available with a neat structure	Data is complete, detailed, and credible
4	Consistency of Findings and Conclusions	Not consistent at all	Low consistency / ambiguous conclusions	Consistent in general	Conclusions are very logical, strong, and supported by data

Data Extraction and Synthesis

Data extraction was conducted through a structured form that included information such as author name, year, article title, gamification platform and elements, learning outcome domains (cognitive, affective, psychomotor), participant characteristics, and analysis techniques. Data were analyzed using Braun & Clarke's thematic approach and visualized with NVivo 12 through the Matrix Coding Query feature to map relationships between elements, as well as Relationship Mapping to conceptually illustrate thematic linkages.

Reporting of Review Results

The results of the review are presented in the form of a thematic synthesis that includes three main themes: (1) the most and least frequently used gamification elements, (2) the relationship between gamification elements and learning outcomes in each domain, and (3) gamification design recommendations based on the empirical effectiveness of the elements. Visualization of the results used graphs, diagrams, and relationship maps to clarify the patterns of relationships and frequency of interrelationships between elements and learning outcome domains.

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C. Result

Distribution and Dominance of Gamification Elements

An analysis of 25 empirical articles reveals the prevalence of reward-based gamification elements in education, including points (88%), digital badges (80%), and leaderboards (72%). Points are used as a means of tracking progress as well as a form of appreciation for student effort, as explained by Abu-Hammad & Hamtini (2023). Digital badges, according to Borines & Adare-tasiwoopa api (2024), play a role in boosting students' confidence, especially when displayed on their learning profiles. Leaderboards, as reviewed by Cigdem et al (2024), can encourage quick responses and a competitive spirit, but also have the potential to demotivate low-achieving students, necessitating more inclusive alternatives, such as group-based leaderboards or individual progress tracking. Additionally, 60% of articles emphasized the importance of immediate feedback, either in the form of automated comments or personalized notes. Schöbel et al (2023) emphasized that this type of feedback helps accelerate the understanding of concepts and encourages self-reflection. Challenge elements also appeared in 48% of the studies, generally in the form of graded missions that are effective for practicing perseverance as well as systematic thinking, as described by Waluyo (2024) in his study on level-based progressive learning.

Meanwhile, reflective and immersive gamification elements are still rarely applied. Storylines only appeared in 20% of articles, learning autonomy in 24%, and role simulation in 16%. Jusas et al (2022)found that environmentally themed narratives were able to increase students' emotional and cognitive engagement through a relevant context. Sailer & Sailer (2021) showed that the freedom to choose learning activities can strengthen intrinsic motivation, as students feel they have control over the learning process. Meanwhile, Thombre & Velankar (2022)proved that role simulation in the context of digital security, such as being a hacker or system protector, can improve understanding of complex concepts. These findings suggest that current gamification practices remain overly focused on external incentives and have not fully optimized elements that support learning depth, emotional engagement, and student independence. To provide a more structured and comprehensive overview of the adoption patterns of gamification elements found in this study, it is presented in Table 1:

Table 1. Distribution of Gamification Elements in 25 Articles

Gamification Elements	Number of Articles	Percentage (%)	Article Title Example	Author
Points	22	88%	Gamification Approach for Making Online Education as Effective as In-Person Education in Learning Programming Concepts	Abu-Hammad & Hamtini (2023)
Badges	20	80%	The effectiveness of badging systems in engaging, motivating, and incentivizing	Borines & Adare-tasiwoopa api (2024)

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			students in the mastery of nursing licensure materials.	
Leaderboards	18	72%	Unlocking student engagement and achievement: The impact of leaderboard gamification in online formative assessment for engineering education	Cigdem et al (2024)
Feedback	15	60%	Gamifying Online Training in Management Education to Support Emotional Engagement and Problem-solving Skills	Schöbel et al (2023)
Challenge	12	48%	Game On! The Effectiveness of Gamified Approaches in Thai Higher Education	Waluyo (2024)
Narrative	5	20%	Game Elements towards More Sustainable Learning in an Object-Oriented Programming Course	Jusas et al (2022)
Autonomy	6	24%	Gamification of in-class activities in flipped classroom lectures	Sailer & Sailer (2021)
Role-Playing	4	16%	Gamification by Students: A practical approach to cybersecurity concept learning	Thombre & Velankar (2022)
Social Interaction	7	28%	Levelling up Learning: Exploring Gamification Impact on Saudi Undergraduates' Student Engagement in Higher Education	Allehaidan (2025)
Surprise/Random Rewards	3	12%	Effects of Gamification on Motivations of Elementary School Students: An Action Research Field Experiment	Mohammed et al (2024)

Study Quality

The methodological quality assessment of the 25 selected articles was conducted using the JBI Critical Appraisal Checklist, which comprises four primary indicators: clarity of research objectives, appropriateness of methodological design, availability and quality of data, and consistency between findings and conclusions. The evaluation results showed that the majority of the articles had adequate to high methodological quality. The clarity of purpose indicator obtained an average score of 3.75, reflecting an explicit and operational formulation of the purpose. Methodological design scored 3.60, with quasi-experimental and mixed methods articles describing design and analysis in more detail than qualitative studies, which still lack transparency in technical reporting. For data quality, the average score of 3.40 showed variation; some articles presented complete data, while others lacked traceable quantitative information. Consistency between findings and conclusions scored 3.55, although some articles were not supported by sufficient quantitative evidence. A

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summary of the assessment results is shown in Table 2 to provide a structured quantitative overview.

Table 2. Average Article Quality Assessment Score Based on Likert Scale (1-4)

No.	Assessment Aspect	Average Score
1	Clarity of Research Objectives	3.75
2	Appropriateness of Methodology Design	3.60
3	Data Availability and Quality	3.40
4	Consistency of Findings and Conclusions	3.55

Overall, the mean scores for the methodological quality of the 25 analyzed articles ranged from 3.40 to 3.75 on a Likert scale of 1-4, which was categorized as high quality based on SLR standards using the JBI Critical Appraisal Checklist instrument. This range of scores reflects that most articles have met the basic indicators of strong methodology, such as clarity of research objectives, appropriateness of design, completeness of data, and consistency between findings and conclusions. This category not only demonstrates adherence to scientific principles but also indicates that the studies can build valid and relevant arguments, particularly regarding the application of gamification in education. With high quality, the results synthesized in this review are methodologically sound rather than speculative or biased. The good internal validity of the articles strengthens the position of the review as a conceptual foothold in the development of evidence-based gamification design and scientifically enriches the practice of digital education.

Rarely Used yet Effective Elements

While the use of points, digital badges, and leaderboards remains the primary practice in the application of gamification in education, an analysis of 25 scholarly articles reveals the significant potential of other untapped elements. Elements such as narrative, freedom to learn, role-play, social interaction, and surprise rewards have a significant influence on student engagement, material comprehension, and holistic competency reinforcement. The dominance of conventional incentive elements provides ease of integration and systematic recording of achievements, but often fails to address the emotional and personal aspects of learning. Meanwhile, elements that are rarely used have the opportunity to strengthen the reflective and contextual dimensions of learning. For example, narratives were found in only five articles, but were shown to create a more emotional and meaningful learning experience. The study by Jusas et al (2022)showed that narratives built around environmental issues in programming learning were able to strengthen students' affective and cognitive connections to the material. Rather than being a visual complement, narratives act as the main structure that shapes student engagement in a relevant and meaningful context.

Students' freedom to set their own learning strategies, known as autonomy, was found in six out of twenty-five articles. Although not widely used, this element is proven to

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increase students' internal motivation and sense of responsibility for their learning outcomes. A study by Sailer & Sailer (2021)showed that when students are given choices in determining the order of modules, the timing of learning, or how to complete tasks, they become more motivated and feel in control of the process. This kind of freedom supports self-managed learning, in contrast to reward-based approaches that often create dependency. In practice, however, some teachers still struggle to implement this flexibility because they are not used to a learning model that adapts to individual needs. Role-playing is also an important element that appears in only four articles, yet has a significant impact on the development of students' critical thinking skills and practical abilities. In Thombre & Velankar (2022) study, students were placed in a simulated cyberattack as either a protector or a system hacker, which encouraged them to understand digital security concepts while actively honing their creativity, cooperation, and problem-solving skills. Unfortunately, the implementation of role-playing demands in-depth planning, including authentic scenarios and facilitator support, which often makes it considered cumbersome in regular classrooms.

Social interaction, as one of the gamification elements, was identified in seven articles and was found to have a positive influence on students' collaborative spirit and emotional well-being. Allehaidan (2025) highlights that collaborative activities, such as group work and peer support, strengthen students' emotional engagement, boost confidence, and create a supportive learning atmosphere. Learning environments formed from social interactions also foster empathy, a sense of shared responsibility, and a spirit of cooperation. However, its implementation requires careful facilitation strategies to maintain balanced and inclusive group dynamics. The element of surprise rewards, found in only three articles, was found to be very effective in maintaining students' attention and curiosity. The study by Mohammed et al (2024)showed that randomly giving a reward after completing a task can increase students' enthusiasm and curiosity. This system works on the principle of unexpected reinforcement, which psychologically encourages exploration and active engagement. To avoid manipulative perceptions, it is important to design rewards ethically, transparently, and not necessarily materially, such as providing access to exclusive content or social recognition. This finding highlights that less popular elements can play a crucial role in fostering more reflective, inclusive, and transformative learning. The challenge ahead lies in improving instructional design skills, utilizing technology effectively, and teachers' readiness to integrate these elements seamlessly into learning practices.

Learning Outcomes by Domain

Analysis of 25 articles reveals that gamification elements contribute differently to cognitive, affective, and psychomotor learning outcome domains; therefore, their selection should be strategically tailored rather than based solely on popularity. Elements such as points, badges, and leaderboards predominantly support improved information retention and academic achievement in the cognitive domain. In contrast, feedback and narrative elements play a role in strengthening self-reflection, concept understanding, and emotional

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engagement in the affective domain. As for project-based or simulation learning, role-playing and social interaction have been proven to promote the development of communication skills, teamwork, and the practical application of materials in the psychomotor domain. Therefore, an in-depth understanding of the linkages between the types of gamification elements and learning objectives is essential to make the designed interventions not only engaging but also pedagogically and contextually effective in supporting 21st-century learning.

1) Cognitive Domain

Cognitive learning outcomes, including concept understanding, critical thinking, long-term retention, and problem-solving, are firmly attributed to gamification elements such as reflective feedback, point systems, and graded challenges, as noted in the 25 articles. These elements stimulate deep mental activity through immediate feedback and the generation of tasks with progressive complexity. The study by Husain et al (2023) showed that combining flow theory-based challenges with instant feedback improved material comprehension and final exam results by 13% compared to the non-gamification group. In addition, leaderboards combined with performance feedback, as described in the study by Cigdem et al (2024), increased engagement and triggered competitive motivation that had a positive impact on quiz scores. Contextual narratives, as in the study by Jusas et al (2022), also strengthened knowledge transfer by linking technical concepts to real-world issues. Overall, the reflective and conceptual elements of gamification are highly effective in enhancing students' cognitive gains in depth and applicability.

2) Affective Domain

In the affective domain, learning outcomes include motivation, emotional engagement, attitude towards learning, and perceived usefulness of materials and activities. Analysis of 25 articles shows that elements such as leaderboards, badges, and social interaction consistently contribute positively to improving students' affective aspects. Team-based leaderboards, as reported by Allehaidan (2025), can increase active participation and a sense of collective responsibility in online forums. Meanwhile, badges as a symbol of recognition encourage positive behavior and create a sense of pride, as shown in Borines & Adare-tasiwoopa api (2024) study. However, the effectiveness of these elements is greatly influenced by students' perception of the fairness of the system and their readiness to use learning technology. The use of a single, absolute leaderboard risks creating psychological distress for low-achieving students. Therefore, personalized, adaptive, or narrative feedback is more effective in building a healthy emotional connection. Gamification designs that target the affective domain must consider the social context and psychological sensitivity of students as a whole.

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3) Psychomotor Domain

The psychomotor domain encompasses practical skills, teamwork, creativity, and the ability to apply concepts in real-world contexts. While gamification elements that support this domain are less commonly used than cognitive or affective elements, an analysis of 25 articles shows that their implementation can have a substantial impact. The study by Okariz et al (2023) showed that challenge-based simulations and role-playing in virtual laboratory activities were able to improve students' experimental skills and independence. Meanwhile, Thombre & Velankar (2022) featured a model where students became the creators of a cybersecurity simulation game, which strengthened their design, collaboration, and problem-solving abilities. Elements such as simulation, project work, and digital artifacts proved effective in building psychomotor skills relevant to 21st-century needs. Therefore, gamification strategies targeting this domain need to be designed to be project- or role-based, so that students are not only actively engaged, but also develop real-world skills that are applicable, contextualized, and aligned with workplace challenges. Table 3 below summarizes the relationship between gamification elements and learning outcome domains:

Table 3. Relationship between Gamification Elements and Learning Outcome Domains

Domain	Most Relevant Gamification Elements	Article Title Example	Author
Cognitive	Feedback, Points, Challenge, Narrative	Students' Achievement in a Flipped Database Management Course: The Impact of Flow Theory Gamification Elements	Husain et al (2023)
Affective	Leaderboards, Badges, Social Interaction	Levelling up Learning: Exploring Gamification Impact on Saudi Undergraduates' Student Engagement in Higher Education	Allehaidan (2025)
Psychomotor	Role-Playing, Simulation, Artifacts	Gamifying Physics Laboratory Work Increases Motivation and Enhances Acquisition of the Skills Required for Application of the Scientific Method	Okariz et al (2023)

D. Discussion

This study aimed to identify dominant gamification design elements in education and examine how they align with learning outcome domains—cognitive, affective, and psychomotor. The findings show that the most prevalent elements are points, badges, and leaderboards, which are often praised for their simplicity and effectiveness in stimulating instant engagement. For example, in the study by Abu-Hammad & Hamtini (2023), point systems served not only as progress trackers but also as motivational tools that reinforce student effort. However, this reward-focused approach is consistent with what Sigalingging et al (2023) describe as extrinsic motivation, which, if relied upon too heavily, can reduce students' intrinsic interest. In the context of gamification, Sailer & Homner (2020) argue that

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such elements tend to become superficial add-ons if not embedded within meaningful learning designs. This pattern appears consistently across various studies, suggesting a preference for ease of implementation over pedagogical depth.

One reason these reward-based strategies may dominate is the practical challenges faced by educators and developers. Unlike points and badges that require minimal planning, deeper elements like narrative and autonomy demand more sophisticated instructional design and technological infrastructure. Liu et al (2021), for example, found that engaging students in narrative-driven scenarios, such as environmental stories, in STEM learning increased both emotional and conceptual engagement. Similarly, Sailer & Sailer (2021) demonstrated that offering autonomy in learning pathways increased students' sense of agency and intrinsic motivation. Despite these benefits, many teachers remain hesitant due to limited training in adaptive learning environments. Thombre & Velankar (2022) reinforce this challenge by showing how role-playing activities, while highly effective in teaching cybersecurity concepts, require meticulous planning, scenario development, and facilitator support. These findings help explain why richer gamification elements are still underutilized in classrooms, despite their proven impact.

In linking gamification to educational outcomes, this study draws on Bloom's taxonomy, Krathwohl's affective domain framework, and Simpson's psychomotor domain. In cognitive learning, feedback, graded challenges, and point systems are consistently linked with improved knowledge retention and critical thinking. Ghoulam & Bouikhalene (2024) noted how increasingly complex tasks pushed students to process information more deeply, while Meylani (2025) found that reflective digital feedback sharpened mathematical problem-solving skills. In the affective domain, badges and group leaderboards increase student pride and social cohesion, consistent with the findings of Borines & Adare-tasiwoopa api (2024) and Allehaidan (2025). Meanwhile, in the psychomotor domain, role-based simulations such as those explored by Okariz et al (2023) have been shown to improve procedural accuracy and collaboration among students. These examples highlight the importance of aligning gamification elements with specific learning outcomes, rather than selecting them based solely on popularity or ease of integration.

When viewed through the lens of existing literature, our findings both confirm and expand upon current understandings of the topic. Fuchs (2023) emphasized that meaningful learning emerges when gamification strategies activate emotional and reflective dimensions. Our review confirms this by demonstrating that rarely used elements, such as surprise gifts and role-playing, can generate significant engagement when aligned with learning objectives. Aura et al (2023) also highlighted the social benefits of role-playing and collaboration, emphasizing their impact on empathy and deep learning. This study adds to that conversation by highlighting how the lack of pedagogical training and infrastructural readiness impedes widespread adoption. In line with Wood & Drew (2025), we argue that without thoughtful alignment to curricular goals and learner profiles, gamification risks being reduced to entertainment rather than a pedagogically valid approach.

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However, there are still some gaps. First, as observed by Prasetya et al (2024), very few studies have explored how combinations of gamification elements, such as narrative with autonomy, or feedback with competition, interact to produce complementary or conflicting results. This review also echoes the concerns of Adams & Du Preez (2022), who noted that most gamification research focuses on short-term metrics without assessing long-term learning retention or sustained motivation. Furthermore, the dominance of quantitative-only designs limits our understanding of learners' nuanced experiences. Only a handful of studies employed mixed-method approaches that could reveal how different learners respond emotionally or behaviorally to gamified environments. Moreover, as noted in the work of Grabner-Hagen & Kingsley (2023), technical documentation remains inconsistent, making replication difficult and undermining the scalability of successful designs.

In closing, the findings suggest that gamification in education is at a crossroads. While reward-based elements dominate due to their ease of use and immediate feedback mechanisms, their educational value diminishes without pedagogical integration. This reinforces Sailer & Homner (2020) proposition that gamification should be rooted in instructional theory, not just user engagement. More reflective, autonomous, and narrative-oriented elements, which, although less common, still show strong potential for holistic learning. To move forward, educators and policymakers must shift from implementing popular tools to developing evidence-based strategies for gamification. This includes promoting teacher training, improving access to adaptive platforms, and fostering interdisciplinary research that blends pedagogy, psychology, and technology. In doing so, gamification can evolve from being a motivational gimmick into a robust framework that supports meaningful, equitable, and sustainable learning in diverse educational settings.

E. Implication

This study presents essential pedagogical and practical implications for implementing gamified learning. It emphasizes the importance of transitioning from strategies that primarily offer external rewards, such as points, badges, and leaderboards, to approaches that incorporate reflective components, like narratives, learner autonomy, and role-playing. These elements contribute to more meaningful learning, fostering critical thinking and self-regulation. By mapping gamification features to cognitive, affective, and psychomotor learning domains, the study offers a structured foundation for designing goal-oriented educational experiences. This enables educators and designers to craft engaging, purposeful, and pedagogically sound interventions. Furthermore, the findings emphasize the importance of aligning gamification with learning objectives, subject content, and student characteristics. As a result, integrating gamification concepts into curriculum planning and teacher training becomes crucial for ensuring sustained educational effectiveness in digital learning environments.

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F. Limitation and Suggestion for Further Research

Despite its comprehensive scope, this study acknowledges several limitations. First, the review focused solely on empirical articles published between 2020 and 2025, which may have excluded relevant works from earlier or ongoing studies. Second, while the use of the SPAR-4-SLR model ensured methodological rigor, the analysis primarily relied on reported outcomes without direct measurement of long-term learning retention or behavioral changes.

Moreover, most of the included studies evaluated gamification in short-term contexts, limiting insights into the sustainability of motivational effects and skill development. The underrepresentation of mixed-methods research further restricts a comprehensive understanding of learners' experiences and the contextual factors influencing the effectiveness of gamification.

Future research is encouraged to explore the longitudinal impacts of gamification, especially those that integrate underutilized elements such as autonomy, narrative, and surprise rewards. Comparative experimental designs assessing different combinations of gamification elements could uncover synergistic or conflicting effects. Furthermore, additional research is required on the implementation of gamification in non-traditional educational contexts (e.g., vocational training, adult education, informal learning) and among diverse learner populations to enhance generalizability.

G. Conclusion

The study concludes that while points, achievement badges, and leaderboards are the most commonly applied gamification elements in digital learning, as recorded in 88 percent, 80 percent, and 72 % of the articles reviewed, respectively, several other elements with pedagogical value are underutilized. Elements such as narration appeared in only 20% of the articles, learning independence in 24%, role-playing in 16%, and surprise rewards in 12%. The analysis showed that feedback and graded challenges were highly effective in improving cognitive outcomes, while leaderboards and social interaction contributed to increased motivation and emotional engagement. Simulation and role-playing were also shown to strengthen practical skills and collaboration in skills learning. Therefore, the effectiveness of gamification depends on the suitability of the elements to the instructional objectives, not on the number of elements used in the design.

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