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Enjoyment or Mastery? A Critical Evidence-Based Analysis of Dominant Outcomes in Gamified Learning

[1]Nihal Tabassum, [2]Talha, [2]Ozal Saeed*

Affiliations:
[1] Khyber Pakhtunkhwa Food Safety and Halal Food Authority, Pakistan
[2] Abasyn University, Peshawar, Pakistan
*Correspondence: ozalsaeed@gmail.com

ABSTRACT

This study investigates whether enjoyment or knowledge mastery plays a more dominant role in gamified learning environments. Using a semantic search across 138 million academic papers and systematic screening criteria, we identified empirical studies that measured both engagement-related and learning-related outcomes. Results reveal a conditional and sequential pattern rather than a single dominant effect. Enjoyment consistently drives initial engagement, supported by strong intrinsic motivation indicators and short-term affective gains. In contrast, mastery emerges more gradually and depends on the alignment of game elements with cognitive learning processes. Studies using superficial elements (e.g., points, badges) reported weaker learning effects, whereas meaningful game mechanics (challenges, feedback, narrative) fostered deeper understanding and retention. Comparative analyses show that enjoyment functions as a motivational catalyst, but mastery becomes dominant only when implementation fidelity is high and pedagogical objectives remain central. These findings highlight that effective gamification requires purposeful design that channels enjoyment into sustained learning pathways.

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Introduction

The rapid expansion of digital learning ecosystems has intensified interest in gamification as a strategy for enhancing student engagement and learning outcomes across educational contexts. Over the past decade, gamification (defined as the integration of game elements such as points, badges, leaderboards, and missions into non-game environments) has been widely promoted as an approach capable of increasing learner motivation and participation [1], [2]. Several studies report that game-like environments can generate immediate excitement and stimulate learners' attention more effectively than conventional instructional methods [3], [4]. As schools increasingly integrate digital platforms such as Kahoot!, Quizizz, and Blooket, understanding the pedagogical consequences of this growing trend has become more urgent, especially as educators face mounting pressure to sustain meaningful learning in technology-rich environments aligned with 21st-century educational goals [5], [6].

Despite its growing popularity, the implementation of gamification presents a critical tension: whether learners' enjoyment of game elements becomes more dominant than their mastery of knowledge. Existing empirical studies show that gamification often produces strong initial engagement driven by visual stimulation, competition, and instant feedback [7], [8]. However, this motivation may be short-lived when game activities emphasize speed, winning, or accumulation of points without deeper cognitive involvement [3]. This phenomenon, referred to as pointsification, risks shifting students' focus toward rewards rather than understanding underlying concepts [9]. Consequently, although fun appears to dominate early phases of gamified learning, its impact on meaningful knowledge acquisition remains inconsistent.

A significant research gap emerges in examining how and under what conditions knowledge mastery becomes dominant within gamified environments. While many studies document increased engagement, fewer explore whether gamification provides scaffolding that supports higher-order thinking, conceptual depth, or long-term retention [10], [11]. Moreover, previous research rarely distinguishes between gamification designs that merely entertain learners and those that deliberately integrate pedagogical principles such as adaptive challenges, formative feedback, metacognitive prompts, or task progression aligned with learning objectives [11], [12], [13]. Without this differentiation, it remains unclear whether gamification functions primarily as a motivational tool or as an effective instructional strategy capable of enhancing cognitive outcomes.

To address this gap, the present study conducts a systematic literature-based analysis to examine the balance between enjoyment and knowledge mastery in gamified learning settings. Specifically, this review aims to determine whether fun or conceptual understanding tends to be more dominant, and under what design conditions each becomes more influential. The study focuses on research published between 2020 and 2025. This period marked by intensified digital

adoption during and after the COVID-19 pandemic, which significantly shaped pedagogical innovation and technology integration [14], [15].

This literature analysis follows a qualitative synthesis approach, drawing on peer-reviewed journal articles, systematic reviews, and empirical studies addressing the cognitive and motivational impacts of gamification. Studies were selected using keyword combinations such as gamification, learning outcomes, engagement, feedback, and conceptual understanding. Inclusion criteria required that each study discuss the relationship between game elements and academic achievement, learning depth, or cognitive processing. Through iterative coding and thematic analysis, the reviewed literature was organized into four overarching themes: (1) the dominance of fun in early engagement, (2) the conditional emergence of knowledge mastery, (3) risks of superficial learning within competitive game structures, and (4) the need for meaningful, pedagogy-driven gamification design.

Findings from the literature consistently show that fun and enjoyment usually dominate the initial phases of gamified learning due to the immediate motivational pull generated by competitive and reward-based game elements [12], [16]. However, deeper knowledge mastery becomes dominant only when gamification is strategically aligned with instructional goals. Studies emphasize the importance of cognitive scaffolding, contextually relevant challenges, and formative feedback mechanisms that require learners to engage with content beyond surface-level responses [17], [18]. By contrast, when gamified systems prioritize speed or external rewards, the risk of shallow learning, reduced conceptual processing, and increased anxiety among low-performing students becomes prominent [19].

Overall, this review highlights that gamification's effectiveness does not lie in the dominance of fun or knowledge alone, but in how game-based elements are pedagogically orchestrated to harmonize motivation and cognition. These findings underscore the need for educators to adopt meaningful gamification principles, ensuring that game elements serve as tools for facilitating deeper learning rather than distractions that overshadow conceptual understanding.

Material and Methods

This study employed a multi-stage evidence synthesis process combining semantic search, systematic screening, and structured data extraction. First, we conducted a semantic search using the query "Which is more dominant when implementing gamification in learning: enjoyment or mastery?" across more than 138 million academic papers indexed in the Elicit search engine, which aggregates Semantic Scholar and OpenAlex. From this search, the 50 most relevant papers were retrieved for further evaluation.

Screening followed predefined inclusion criteria focused on educational gamification contexts, dual outcome measurement (enjoyment/ engagement and learning/ mastery), empirical research designs, explicit examination of game elements, and studies presenting verifiable empirical data. Papers centered solely on serious games, recreational gaming, or non-empirical formats were excluded. Screening decisions were made holistically by considering all criteria collectively.

For eligible studies, data were extracted using a large language model following detailed instructions. Extracted dimensions included gamification design features, study methodology, enjoyment-related outcomes (e.g., motivation scales, engagement metrics), and learning outcomes (e.g., test scores, retention measures). Additional categories captured comparative analyses between enjoyment and learning effects, theoretical mechanisms underlying gamification, moderating contextual factors, and study limitations. This structured extraction enabled cross-study comparison of how enjoyment and mastery interact within gamified learning environments and under what conditions one becomes more dominant than the other.

Results and Discussion

Table 1 summarizes empirical evidence showing how gamification influences learners' enjoyment and engagement, highlighting measurement approaches, motivational responses, and reported improvements across diverse educational and training contexts.

Table 1. Effects on Enjoyment and Engagement in Gamification Studies

Study	Enjoyment/ Engagement Measures	Effect Size/ Magnitude	Key Findings
Bai et al. [20]	Qualitative analysis of 32 studies; Intrinsic Motivation Scale; MG Mechanics; MG Aesthetics	Not quantified	Identified a positive correlation between intrinsic motivation and game mechanics/aesthetics; gamification fosters enthusiasm, provides feedback, fulfills recognition needs, and promotes goal setting.
Buckley and Doyle [21]	Intrinsic motivation scales; social relatedness need satisfaction scales	Intrinsic motivation: g = .75; Social relatedness: g = .60	Significant positive effects on intrinsic motivation and social relatedness; students reported reduced risk of attrition with additional badges earned.
Sailer and Homner [22]	Badges, leaderboards, and daily active users (DAUs)	Statistically significant increase in DAUs when competition emails were sent	Demonstrated that competition-based gamification increased DAUs; engagement improved when performance reminders were issued.
Roche [23]	Enjoyment Level Scale	25% increase in engagement; 20% increase in perceived enjoyment	Leaderboards were highly motivating (SD = 0.65); found strong links between retention and engagement (correlation = 0.65).

Study	Enjoyment/ Engagement Measures	Effect Size/ Magnitude	Key Findings
Smirani and Yamani [24]	Questionnaire on understanding and engagement	Positive impact weight = 0.099	Gamification improved enjoyment and perceived engagement; students reported enhanced understanding, cooperation, and class identity; preferred extension-related rewards.
Nair and Mathew [26]	Questionnaire on student and teacher enjoyment	Not quantified	Students and teachers enjoyed the gamified experience; activities were more fun and engaging compared to traditional methods.
O'Donovan et al. [25]	Student enjoyment and engagement were measured through lecture attendance records, course participation, lecturer evaluations, and a post-course Likert-scale questionnaire assessing perceived engagement, motivation, understanding, and overall course improvement resulting from the gamified design.	The study did not report standardized effect sizes such as Cohen's d. However, statistical comparison using a t-test showed significantly higher mean course grades in the gamified cohort ($p = 0.031$), alongside substantially increased lecture attendance rates.	Gamification significantly improved student engagement, lecture attendance, and perceived understanding. Leaderboards and experiential rewards were the strongest motivators, while narrative elements were less impactful. Overall academic performance improved, though outcomes were sensitive to design choices and implementation costs.

Table 2 presents findings on learning outcomes in gamification studies, illustrating changes in achievement, understanding, and skill development, alongside comparative results between gamified and non-gamified instructional conditions.

Table 2. Learning Outcomes in Gamification Studies

Study	Learning Measures	Effect Size/ Magnitude	Key Findings
Bai et al. [20]	Student academic performance	Hedges' $g = 0.504$ (95% CI [0.284–0.723], $p < .001$)	Gamified learning interventions showed a significant medium effect size in favor of improved learning outcomes.
Buckley and Doyle [21]	Feedback from correct/wrong answers; learner performance indicators	Not explicitly measured due to pandemic limitations	Gamification demonstrated a positive indirect effect on learning, mediated by learning process performance.
Sailer and Homner [22]	Application-oriented knowledge via multiple-choice questions	No significant direct effect	Gamification did not significantly improve application-oriented knowledge despite enhancing motivation-related variables.
Roche [23]	Retention of knowledge; final exam grades	OR = 1.8 (95% CI 1.0–3.4) for correct responses on repeated questions	Statistically significant increase in odds of correct responses over time; differences in final exam performance observed across player types.
Smirani and Yamani [24]	Learner performance; knowledge retention; perceived learning effectiveness	30% improvement in learner performance	Despite objective improvements, students reported a slight negative perception regarding gamification's impact on learning effectiveness.

Study	Learning Measures	Effect Size/ Magnitude	Key Findings
Nair and Mathew [26]	Knowledge increase; course marks	Mean increase from 70.8% to 74.9% (t-test p = 0.031)	Gamified module resulted in statistically significant improvement in student grades.
O'Donovan et al. [25]	Student academic performance; perceived learning	Not specified	Students demonstrated significant improvement in learning outcomes; gamified design increased knowledge and overall course performance.

Fig. 1 compares reported learning outcome effects across gamification studies, showing considerable variation in effect magnitude, with recent studies indicating stronger impacts on achievement and performance than earlier implementations.

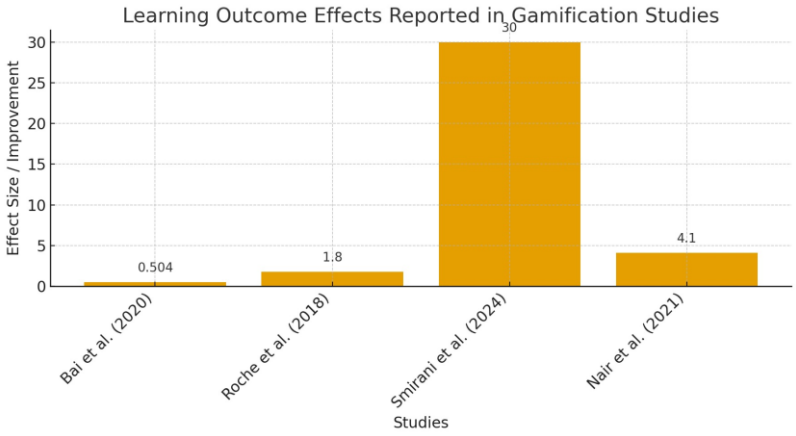


Fig. 1. Learning Outcome Effects

Discussion

A critical analysis of recent evidence suggests that neither enjoyment nor mastery universally dominates gamified learning; instead, their relationship follows a conditional and hierarchical model. Enjoyment tends to exert the strongest influence during the initial stages of engagement, where visual stimulation, reward structures, and competition generate immediate motivational effects [3], [16]. These early effects often produce large gains in intrinsic motivation and short-term participation, functioning as a catalyst that initiates subsequent learning processes. By contrast, mastery develops more gradually, emerging through repeated exposure, guided practice, and cognitively aligned challenges that foster deeper processing [11], [17]. The specific game elements selected play a decisive role: deeper elements such as narrative, autonomy, and adaptive challenges are consistently associated with meaningful learning gains [13], while superficial elements like points and badges primarily enhance enjoyment without necessarily improving conceptual understanding [6], [9], [27].

These dynamics are further shaped by differences in measurement timing. Studies that assess outcomes immediately after a gamified intervention often report heightened enjoyment

but limited evidence of durable learning, short-term benefits may reflect momentary excitement rather than sustained understanding [28], [29]. Only a few studies demonstrates retention gains months later, offer evidence of long-term learning effects [8]. Implementation fidelity also plays a crucial role, learners sometimes report a slight negative perception of learning effectiveness even when their objective performance improves, suggesting that poorly aligned gamification may create enjoyable yet superficial engagement [30], [31]. This perception–reality gap highlights students' sensitivity to designs that prioritize entertainment over authentic cognitive growth.

Taken together, these findings indicate that enjoyment and mastery are not competing forces but interconnected components of a hierarchical process. Enjoyment operates as a proximal motivational outcome that, when strategically designed, establishes the foundation for sustained engagement leading to mastery. However, enjoyment alone is insufficient and may even be counterproductive if it diverts attention from core learning goals. Mastery—understood as the ultimate educational objective—depends not on the dominance of fun but on the alignment of game elements with cognitive mechanisms that transform initial motivation into durable learning [6], [7].

Table 3 contrasts fun-oriented and knowledge-mastery-focused gamified learning, illustrating how enjoyment-driven elements enhance engagement, while mastery-oriented designs more consistently support sustained learning outcomes and conceptual understanding.

Table 3. Comparison between Fun vs. Knowledge Mastery in Gamified Learning

Aspect	Fun/ Enjoyment Dominance	Knowledge Mastery Dominance
Primary Driver	Immediate engagement through visual appeal, competition, and rewards	Deep cognitive processing through scaffolded challenges and meaningful tasks
Initial Impact	High motivation at the beginning of the activity	Moderate at first, increases as learning progresses
Learning Depth	Often leads to superficial learning if not guided	Supports deeper conceptual understanding
Sustainability of Motivation	Short-term; may decline once novelty fades	Long-term; grows with competence and meaningful progress
Role of Game Elements	Points, badges, and leaderboards act mainly as external motivators	Game elements are aligned to learning goals and provide formative feedback
Student Focus	Winning, speed, and competition	Understanding concepts and improving performance
Risks	Distraction from learning objectives; overemphasis on rewards	Requires well-designed pedagogy; may be less exciting without gamified engagement
Best Conditions	When used to spark initial interest or energize classroom activity	When integrated with instructional goals and feedback mechanisms
Potential Outcomes	High engagement but limited knowledge retention	Improved mastery, deeper learning, and better long-term retention

In evaluating the dominance of fun versus knowledge mastery within gamified learning environments, it is essential to recognize that both dimensions operate differently but can

complement each other when designed effectively. Fun or enjoyment typically emerges as the more dominant factor at the initial stage of implementation. Game elements such as points, badges, leaderboards, and competitive challenges generate immediate engagement by appealing to students' curiosity, excitement, and desire for recognition. However, this motivational effect tends to be short-lived and may lead to superficial learning when activities prioritize speed or winning over meaningful cognitive engagement.

In contrast, knowledge mastery becomes dominant only when gamification is deliberately aligned with instructional goals. When learning tasks are embedded within well-structured challenges, supported by informative feedback, and linked to progressive levels of difficulty, students are more likely to engage in deeper processing and conceptual understanding. This form of gamified learning promotes sustained motivation, as students perceive their progress as meaningful and connected to learning outcomes rather than merely tied to external rewards.

While fun can successfully capture attention and energize the classroom, it does not guarantee long-term retention or comprehension. Knowledge mastery, on the other hand, requires pedagogically sound design that integrates game mechanics with cognitive scaffolding. Thus, the effectiveness of gamification depends not on the dominance of fun alone but on how well enjoyment is leveraged to support and not overshadow the development of students' knowledge and skills.

Conclusion

This review demonstrates that enjoyment and mastery do not compete for dominance in gamified learning; instead, they operate in a conditional, sequential relationship. Enjoyment consistently emerges as the immediate driver of engagement, while mastery develops more gradually when game elements are aligned with learning processes. Evidence shows that superficial gamification boosts short-term motivation but does not guarantee learning, whereas deeper, cognitively meaningful elements support sustained knowledge gains. The relative dominance of each outcome depends on design quality, implementation fidelity, and temporal factors. Thus, effective gamification requires intentionally channeling enjoyment into structured learning pathways to ensure meaningful and durable mastery.

Conflict of Interest

The author declares that there are no conflicts of interest in this study.

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Authors



Nihal Tabassum is working as a Legal Assistant at the Khyber Pakhtunkhwa Food Safety and Halal Food Authority, Pakistan, and holds an LLM degree in Human Rights. Nihal has over a decade of legal experience advocating for human rights, gender violence, discrimination, and the mental health impact of intimate partner behavior, working directly with women and transgender individuals to drive legal reform and social justice. (email: Nihaltabassum11@gmail.com).



Talha is a dedicated PhD Scholar at Abasyn University, Peshawar, Pakistan, and serves as an Assistant Professor at the same institution. His academic interests lie in organizational behavior, management sciences, and strategic leadership. As a faculty member, he teaches and supervises research and scholarly publications that advance management theory and practice. His doctoral research explores innovative solutions in educational and business management systems. Mr. Talha is also involved in curriculum development and institutional research activities that support the growth of quality assurance in academic settings. (email: talha1857@gmail.com).



Ozal Saeed is a Ph.D. scholar at Abasyn University, Peshawar, Pakistan. His academic interests focus on interdisciplinary research within management, education, and public administration. Committed to academic excellence, he is involved in various scholarly activities and research collaborations aimed at contributing to the advancement of knowledge in his field. (email: ozalsaeed@gmail.com).