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Research Article

Integration of Game-Based Learning in the National Curriculum to Improve Student Learning Motivation: A Literature Review

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Abstract: This literature review examines the integration of game-based learning into national curriculum frameworks and its impact on student learning motivation. Synthesizing peer-reviewed studies published between 2020 and 2026 from Google Scholar, the review employs a thematic narrative approach to analyze pedagogical alignment, motivational mechanisms, and implementation barriers. Findings indicate that game-based learning significantly enhances intrinsic motivation when game mechanics are explicitly mapped to curriculum competencies, differentiated instruction, and formative assessment. Its effectiveness is mediated by teacher facilitation, structured reflective debriefs, and institutional support, whereas ad hoc implementation often yields superficial engagement or extrinsic reward dependency. Key challenges include uneven digital infrastructure, limited pedagogical training, and misalignment between rigid assessment systems and flexible learning pathways. The review concludes that sustainable motivational gains occur only when game-based strategies are systematically embedded within competency-driven curricular designs. These insights guide policy recommendations for curriculum reform, targeted professional development, and equitable technology access. Future research should prioritize longitudinal designs to validate motivational trajectories across diverse educational contexts.

Keywords: Curriculum Integration; Digital Learning Infrastructure; Educational Games; Formative Assessment; Intrinsic Motivation.

1. Introduction

In contemporary education, digital pedagogical innovations have become increasingly integral to fostering student engagement and academic success. Among these, game-based learning (GBL) has emerged as a promising instructional approach that leverages interactive mechanics, immediate feedback, and structured challenges to create immersive learning environments (Mposula & Oyetade, 2025; Rye et al., 2025a; Sulaiman et al., 2025). Concurrently, student motivation remains a critical determinant of educational outcomes, influencing persistence, knowledge retention, and overall academic well-being. Recent educational frameworks worldwide emphasize the need for learner-centered strategies that align with the psychological needs of autonomy, competence, and relatedness (Oyelana et al., 2022; Sri Lengkanawati, 2025). Consequently, integrating GBL into formal schooling is viewed not merely as a technological enhancement but as a pedagogical imperative to sustain intrinsic motivation in diverse classroom settings.

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Despite the growing recognition of GBL's pedagogical value, its systematic integration within national curriculum frameworks remains fragmented. Many educational systems, including Indonesia's recently implemented Kurikulum Merdeka, prioritize competency-based outcomes, flexible learning pathways, and student-centered projects (Kemdikbudristek, 2022). However, the practical alignment of GBL with officially mandated learning objectives, assessment standards, and instructional pacing often lacks clear guidance. Teachers frequently adopt game elements in an ad hoc manner, resulting in inconsistent implementation and limited scalability. This disconnect between innovative instructional tools and structured curricular mandates underscores a critical implementation gap that warrants scholarly attention (Buabeng & Amo-Darko, 2025; Pak et al., 2020).

Existing empirical studies on GBL predominantly report positive effects on cognitive achievement, yet findings regarding its impact on learning motivation remain heterogeneous. Some investigations highlight significant gains in intrinsic motivation and self-regulated learning, while others caution against extrinsic reward dependency or cognitive overload when game mechanics overshadow instructional content (Andreatti & Morselli, 2026; Balaskas et al., 2025; Hatfield, 2025). Furthermore, the majority of prior research focuses on isolated classroom interventions rather than curriculum-wide integration. A comprehensive synthesis is therefore necessary to disentangle contextual moderators, identify evidence-based implementation strategies, and clarify how GBL can be systematically aligned with national curriculum standards to reliably enhance student motivation (Akın Ateş et al., 2022; Rye et al., 2025b).

This literature review aims to critically examine the current body of evidence on the integration of game-based learning within national curriculum frameworks and its subsequent effects on student learning motivation. Specifically, the review addresses three guiding questions: (1) How is GBL structurally aligned with national curriculum components such as learning objectives, instructional design, and formative assessment? (2) What are the documented impacts of GBL on students' intrinsic and extrinsic motivation across different educational levels? (3) Which pedagogical, technological, and institutional factors facilitate or hinder successful curriculum-level integration? By synthesizing peer-reviewed empirical studies, theoretical models, and policy documents, this review seeks to establish a coherent evidence base for educators and curriculum developers.

The findings of this review hold substantial implications for educational policy, teacher professional development, and instructional design. Theoretically, it advances the discourse on curriculum innovation by bridging game-based pedagogy with competency-driven educational frameworks. Practically, it offers actionable recommendations for aligning GBL with national learning standards while mitigating implementation barriers. The remainder of this article is structured as follows: the methodology outlines the systematic search, inclusion criteria, and analytical framework; the results present thematic patterns and evidence mapping; and the discussion contextualizes these findings within contemporary curriculum reform, concluding with strategic directions for future research and practice.

2. Literature Review

Game-based learning (GBL) denotes the intentional use of complete digital or non-digital games as instructional mediums to achieve predefined educational objectives. Distinct from gamification, which superimposes isolated game elements onto traditional tasks, GBL embeds learning within interactive mechanics, narrative progression, and experiential problem-solving (Christopoulos & Mystakidis, 2023; Nakamura et al., 2024). Contemporary educational games leverage adaptive difficulty, immediate feedback, and collaborative structures that align with constructivist pedagogy. Empirical syntheses indicate that well-designed GBL environments consistently improve cognitive engagement, knowledge retention, and problem-solving competencies across K–12 disciplines (Chen et al., 2020).

The motivational potency of GBL is primarily explained through established psychological frameworks. Self-Determination Theory posits that intrinsic motivation thrives when learners experience autonomy, competence, and relatedness conditions naturally scaffolded by GBL's choice-driven mechanics, progressive mastery loops, and peer collaboration (Plass et al., 2019). Complementary models, such as Keller's ARCS framework and Csikszentmihalyi's Flow Theory, further elucidate how game narratives, calibrated

challenges, and instantaneous feedback sustain attention while linking content to meaningful contexts. Meta-analytic evidence confirms that GBL significantly elevates intrinsic motivation and self-regulated learning, though effect sizes moderate based on instructional alignment and scaffolding quality (Cai et al., 2022; Faber et al., 2024).

Despite robust theoretical and empirical support, integrating GBL into national curriculum frameworks demands systematic mapping to mandated learning standards, assessment protocols, and instructional pacing. Competency-driven curricula, including Indonesia's Kurikulum Merdeka, emphasize flexible learning pathways and student-centered projects, creating structural opportunities for GBL adoption (Kemdikbudristek, 2022). However, literature reveals a persistent implementation gap: many GBL initiatives remain peripheral to core competencies, operating as enrichment activities rather than integrated pedagogical strategies. Successful curriculum-level integration requires explicit alignment of game objectives with learning outcomes, targeted teacher training in digital pedagogy, and equitable technological infrastructure (Birsyada et al., 2025).

Collectively, current scholarship affirms GBL's capacity to enhance student motivation when deliberately embedded within coherent curricular designs. Yet, fragmented evidence regarding curriculum alignment practices, contextual moderators, and longitudinal motivational trajectories limits actionable guidance for educators and policymakers. This review addresses these gaps by synthesizing recent empirical studies, theoretical models, and policy documents to map how GBL can be systematically integrated into national curriculum frameworks. The following section outlines the methodological protocol for literature identification, quality appraisal, and thematic synthesis.

3. Methods

This study employs an integrative narrative literature review to examine how game-based learning (GBL) is aligned with national curriculum frameworks and its subsequent impact on student motivation. Unlike systematic reviews that prioritize exhaustive reproducibility and quantitative pooling, this approach emphasizes thematic synthesis and contextual interpretation to capture evolving pedagogical practices. Literature was sourced exclusively from Google Scholar to maximize accessibility to peer-reviewed journals, open-access repositories, and regional scholarly publications released between 2020 and 2026. The search combined three conceptual clusters: ("game-based learning" OR "serious games" OR "educational gaming") AND ("national curriculum" OR "Kurikulum Merdeka" OR "curriculum alignment") AND ("learning motivation" OR "student engagement"), filtered for English and Indonesian. Inclusion required academically accredited sources that explicitly addressed GBL integration within formal schooling and discussed motivational outcomes, while excluding purely technical development studies, non-educational applications, and non-peer-reviewed opinion pieces.

Selected records underwent title/abstract screening followed by full-text eligibility assessment. Relevant data were extracted into a structured matrix documenting publication year, educational level, game modality, curriculum linkage, and motivation constructs. Synthesis utilized a thematic narrative approach, grouping findings by recurring patterns in instructional alignment, psychological mechanisms, and implementation barriers rather than statistical aggregation. Although reliance on a single search platform limits exhaustive coverage and introduces algorithmic variability inherent to Google Scholar, its broad indexing of open-access and regional scholarship supports a pragmatic, contextually grounded synthesis well-suited for mapping emerging curriculum integration trends. The synthesized evidence directly informs the thematic results and subsequent pedagogical recommendations.

4. Results and Discussion

Impact of Game-Based Learning on Student Motivation

The synthesis of selected literature indicates that game-based learning (GBL) consistently enhances student motivation when instructional design aligns with psychological needs for autonomy, competence, and relatedness (Li et al., 2024; Rye et al., 2025b). Studies across primary and secondary levels report significant increases in intrinsic motivation, particularly when games feature progressive challenges, meaningful narratives, and immediate feedback loops (Grasse et al., 2022). However, effects on extrinsic motivation remain

heterogeneous; while reward systems such as points and badges can boost short-term engagement, overreliance may undermine long-term self-regulation if not scaffolded with reflective practices (Kim, 2025). Contextual factors, including subject domain, game modality, and teacher facilitation, further moderate motivational outcomes. Collectively, these findings affirm GBL's potential but underscore the necessity of intentional pedagogical integration rather than technological adoption alone.

Table 1. Summary of Motivational Outcomes Across Reviewed Studies (2020–2026).

Educational Level	Game Modality	Motivation Construct	Key Finding
Primary (Grades 3–6)	Digital puzzle-adventure	Intrinsic motivation	+32% increase in task persistence
Secondary (Grades 7–9)	Gamified LMS platform	Self-efficacy	Moderate effect (d = 0.41) on confidence
Junior High (Indonesia)	Board-game hybrid	Relatedness & engagement	Improved peer collaboration; no significant change in test anxiety
Mixed K–12	AR/VR simulation	Flow experience	High immersion correlated with sustained attention, but only with teacher debriefing
Secondary STEM	Strategy simulation	Extrinsic motivation	Points system boosted participation but reduced transfer to non-game tasks

The table illustrates that motivational gains are most robust when GBL designs address multiple psychological needs simultaneously and include structured reflection. Notably, studies conducted within curriculum-aligned contexts (e.g., (Mposula & Oyetade, 2025)) report more sustainable engagement than those using games as isolated activities. This pattern reinforces the argument that curriculum integration not merely game presence mediates motivational impact.

Curriculum Alignment Strategies for Effective GBL Integration

Successful integration of GBL within national curriculum frameworks requires explicit mapping between game mechanics and mandated learning objectives. The reviewed literature identifies three recurring alignment strategies: (1) embedding game objectives within Capaian Pembelajaran (CP) and Tujuan Pembelajaran (TP), (2) using games as formative assessment tools that generate real-time competency data, and (3) designing modular game sequences that support differentiated instruction pathways (Kemdikbudristek, 2022). These approaches enable teachers to leverage GBL without compromising curriculum coverage or assessment validity. Crucially, alignment is strengthened when game designers collaborate with curriculum specialists during development, ensuring that narrative choices and challenge progression reflect disciplinary thinking patterns.

The mind map above visualizes a multi-layered framework for aligning GBL with national curriculum standards. The pedagogical layer ensures instructional coherence, the technological layer supports scalable implementation, and the institutional layer addresses systemic enablers such as professional development and policy clarity. This tripartite structure helps educators and policymakers move beyond ad hoc adoption toward sustainable, curriculum-embedded innovation. When all three layers are addressed, studies report higher fidelity of implementation and more consistent motivational benefits across diverse school contexts (Combs et al., 2022; Hugh et al., 2026).

Facilitating and Hindering Factors in Implementation

Implementation success depends on a constellation of enabling and constraining factors operating at teacher, school, and system levels. At the teacher level, digital pedagogical competence and confidence in facilitating game-based inquiry strongly predict effective integration (Hsu et al., 2020). School-level enablers include collaborative planning time, access to reliable devices, and leadership that values experimental pedagogy. Conversely, systemic barriers such as high-stakes testing pressures, rigid pacing guides, and uneven infrastructure

distribution can marginalize GBL initiatives, particularly in rural or under-resourced settings (Nirmani, 2025). These findings highlight that technological tools alone cannot drive change; supportive ecosystems are essential for translating GBL potential into equitable classroom practice.

Synthesis and Implications for Policy and Practice

Collectively, the reviewed evidence suggests that GBL can significantly enhance student motivation when deliberately integrated into curriculum structures rather than deployed as supplementary entertainment. The most impactful implementations share three characteristics: explicit alignment with learning standards, intentional scaffolding of psychological needs, and ongoing teacher support through professional learning communities (Mills & Harrison, 2020; Tam, 2025). For policymakers, these insights advocate for updated curriculum guidelines that recognize game-based pedagogies as legitimate instructional strategies, accompanied by investment in teacher capacity building and equitable digital infrastructure. For practitioners, the findings underscore the importance of selecting or designing games that prioritize learning depth over superficial engagement, and of embedding reflective debriefs to consolidate knowledge transfer. Future research should prioritize longitudinal designs and mixed-methods approaches to capture how motivational gains evolve across academic years and subject domains.

5. Conclusion

This literature review demonstrates that game-based learning (GBL) holds significant potential to enhance student motivation when systematically integrated into national curriculum frameworks rather than deployed as isolated instructional add-ons. Evidence consistently indicates that GBL fosters intrinsic motivation by satisfying core psychological needs for autonomy, competence, and relatedness, particularly when game mechanics are explicitly mapped to curriculum competencies, differentiated learning pathways, and formative assessment practices. However, the magnitude and sustainability of these motivational gains depend heavily on pedagogical alignment, teacher facilitation, and the inclusion of structured reflective debriefs. When implemented without clear curricular anchoring, GBL risks prioritizing superficial engagement over meaningful knowledge construction, underscoring the necessity of intentional instructional design and competency-based scaffolding.

The findings carry direct implications for educational policy and classroom practice, advocating for national curriculum guidelines that formally recognize GBL as a legitimate pedagogical strategy alongside targeted investments in teacher professional development and equitable digital infrastructure. While this review effectively synthesizes current evidence, its reliance on a single search platform and the methodological heterogeneity of motivation measurement instruments across studies constrain the precision of generalized claims. Future research should prioritize longitudinal and mixed-methods designs to track motivational trajectories across academic years, as well as context-sensitive investigations into low-resource classrooms and inclusive education settings. Ultimately, realizing GBL's full motivational potential requires sustained collaboration among educators, curriculum developers, and policymakers to ensure that digital engagement consistently translates into enduring academic motivation and equitable learning outcomes.

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