



**FROM MOTIVATION TO MASTERY: A SYSTEMATIC LITERATURE  
SYNTHESIS OF GAMIFIED AND GAME-BASED APPROACHES IN  
ONLINE LEARNING ENVIRONMENTS**

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**Abstract**

This paper synthesizes empirical and theoretical research comparing gamification and game-based learning (GBL) in online learning environments across higher education and professional contexts. Drawing upon Self-Determination Theory, Flow Theory, and Cognitive Load Theory, the study reviews empirical findings from 2012–2025 to evaluate how these approaches influence motivation, engagement, learning outcomes, and retention. Evidence suggests that both strategies can enhance engagement and learning, but they differ in scope and sustainability. Gamification improves short-term participation and measurable task performance, while GBL supports intrinsic motivation, deep learning, and long-term retention through meaningful interaction and narrative immersion. Design quality—particularly autonomy, feedback, narrative fidelity, and inclusivity—moderates effectiveness. This synthesis concludes that hybrid frameworks integrating gamified reinforcement with game-based learning contexts yield optimal outcomes in online education.

**Keywords:** gamification, game-based learning, online learning, motivation, engagement, higher education, instructional design

**Аннотация**

В данной статье синтезируются эмпирические и теоретические исследования, сравнивающие геймификацию и обучение на основе игр (GBL) в онлайн-среде в контекстах высшего образования и профессиональной подготовки. Опираясь на теорию самодетерминации, теорию потока и теорию когнитивной нагрузки, в исследовании анализируются эмпирические данные за период с 2012 по 2025 год с целью оценки влияния этих подходов на мотивацию, вовлеченность, результаты обучения и сохранение знаний. Полученные данные свидетельствуют о том, что обе стратегии могут повышать вовлеченность и эффективность обучения, однако они различаются по масштабу воздействия и устойчивости результатов. Геймификация улучшает краткосрочное участие и измеримые показатели выполнения задач, в то время как GBL поддерживает



внутреннюю мотивацию, глубокое обучение и долгосрочное усвоение знаний за счет осмысленного взаимодействия и погружения в нарратив. Эффективность подходов зависит от качества дизайна, в частности, таких факторов как автономия, обратная связь, достоверность narrative и инклюзивность. В результате синтеза делается вывод, что гибридные модели, интегрирующие геймифицированное подкрепление в контексты обучения на основе игр, обеспечивают оптимальные результаты в онлайн-образовании.

**Ключевые слова:** геймификация, обучение на основе игр, онлайн-обучение, мотивация, вовлеченность, высшее образование, дизайн обучения

### Annotatsiya

Ushbu maqolada oliy ta'lim va kasbiy tayyorgarlik kontekstida onlayn muhitda geymifikatsiya va o'yin asosidagi ta'limni (OAT) solishtirgan empirik va nazariy tadqiqotlar yig'ilgan. Tadqiqotda o'z-o'zini belgilash nazariyasi, oqim nazariyasi va kognitiv yuk nazariyasiga tayanib, 2012-2025 yillar davomidagi empirik ma'lumotlar tahlil qilinib, ushbu yondashuvlarning motivatsiya, ishtirokchilik, o'quv natijalari va bilimlarni saqlab qolishga ta'siri baholanadi. Olingan ma'lumotlar shuni ko'rsatadiki, ikkala strategiya ham ishtirokchilik va o'quv samaradorligini oshirishi mumkin, biroq ular ta'sir doirasi va barqarorligi jihatidan farq qiladi. Geymifikatsiya qisqa muddatli ishtirokni va vazifa bajarishning o'lchanadigan ko'rsatkichlarini yaxshilaydi, OAT esa mazmunli o'zaro ta'sir va hikoyaga cho'kish orqali ichki motivatsiyani, chuqur o'rganishni va uzoq muddatli bilimlarni o'zlashtirishni qo'llab-quvvatlaydi. Yondashuvlarning samaradorligi dizayn sifati, xususan, avtonomiya, fikr-mulohaza, hikoyaning ishonchliligi va inklyuzivlik kabi omillarga bog'liq. Xulosa qilib shuni aytish mumkinki, geymifikatsiyalangan mustahkamlashni o'yin asosidagi ta'lim kontekstlariga birlashtirgan gibrid modellar onlayn ta'limda optimal natijalarni ta'minlaydi.

**Kalit so'zlar:** geymifikatsiya, o'yin asosidagi ta'lim, onlayn ta'lim, motivatsiya, ishtirokchilik, oliy ta'lim, o'quv dizayni

## 1. Introduction

The growing shift toward online and blended education in higher education has intensified the need for pedagogical strategies that sustain motivation and deepen learning. Conventional lecture-based approaches often fail to engage students in virtual settings, leading to lower persistence and satisfaction (Dichev & Dicheva, 2017). To address this challenge, educators increasingly turn to game-inspired learning frameworks that draw on the motivational affordances of play.



Two major paradigms dominate this space: gamification and game-based learning (GBL). Gamification incorporates selected game design elements—such as points, badges, levels, and leaderboards—into non-game contexts (Deterding et al., 2011). In contrast, GBL embeds learning objectives within complete or substantial game experiences, allowing learners to acquire knowledge and skills through immersive gameplay. While both share motivational underpinnings, their mechanisms and educational outcomes differ.

Despite the popularity of both models, comparative evidence remains fragmented. Some studies highlight significant improvements in motivation and engagement (Hamari et al., 2014; Madero-Gonzalez et al., 2024), whereas others note inconsistent or short-lived effects (Zhang & Yu, 2022). This review therefore aims to systematically synthesize current research to clarify when and how each approach is most effective in online learning contexts.

## 2. Theoretical Framework

### 2.1 Motivation and Engagement

Self-Determination Theory (SDT) (Deci & Ryan, 2000) posits that autonomy, competence, and relatedness drive intrinsic motivation. Gamified environments can fulfill competence through feedback and achievement systems, while GBL often enhances autonomy and relatedness by integrating authentic roles and narratives (Su & Cheng, 2015). Flow Theory (Csikszentmihalyi, 1990) explains how an optimal balance between challenge and skill leads to deep engagement. Gamified systems often generate short bursts of flow through immediate rewards, while GBL sustains longer flow states by embedding learning within meaningful progression.

### 2.2 Cognitive Load and Multimedia Learning

According to Cognitive Load Theory (Sweller, 1994), instructional design must balance intrinsic, extraneous, and germane load. Poorly designed gamified systems may increase extraneous load via unnecessary competition or cluttered interfaces. In contrast, GBL can reduce extraneous load if language, visuals, and interaction are cohesively aligned with learning objectives (Mayer, 2009).

## 3. Methodology

### 3.1 Search Strategy and Selection

A systematic search was conducted in Scopus, Web of Science, ERIC, and ScienceDirect, focusing on literature published between 2012 and 2025. Keywords included *gamification*, *game-based learning*, *online learning*, *motivation*, and *engagement*.

### 3.2 Inclusion Criteria



Studies were included if they:

1. Addressed higher education or online learning contexts;
2. Empirically evaluated gamification or GBL interventions;
3. Reported measurable outcomes in motivation, engagement, learning, or retention;
4. Were published in peer-reviewed English-language journals.

After screening, 40 articles met the criteria. Ten key studies were analyzed in depth to represent the diversity of methods, disciplines, and findings.

#### 4. Results

##### 4.1 Motivation and Engagement

Most studies report that gamification enhances immediate motivation by providing extrinsic incentives and feedback (Hamari et al., 2014; Tonhão et al., 2024). Badges and leaderboards can encourage repetition and participation but may create stress or disengagement if overly competitive. GBL, by contrast, fosters intrinsic motivation through storytelling, exploration, and self-paced challenge. Gafni and Gafni (2022) found that adding fantasy narratives to gamified systems significantly improved both motivation and social interaction among online learners.

##### 4.2 Learning Outcomes and Performance

Gamified approaches often yield measurable gains in short-term academic performance and retention of discrete knowledge, such as definitions or procedures (Zhang & Yu, 2022). GBL studies, however, show greater improvement in complex cognitive and collaborative skills, including critical thinking and applied problem-solving (López-Fernández et al., 2024).

##### 4.3 Retention and Transfer

Gamification's motivational effects tend to decline after novelty fades, while GBL sustains engagement longer due to emotional and narrative investment (Cavus et al., 2022). Madero-Gonzalez et al. (2024) demonstrated that online engineering students retained problem-solving abilities longer when exposed to narrative-based GBL modules than in gamified quiz formats.

##### 4.4 Moderating Design Factors

Several factors moderate effectiveness:

- Narrative and Context: Story-driven designs enhance immersion and retention.
- Feedback and Progression: Continuous feedback supports perceived competence.
- Autonomy: Choice and exploration sustain intrinsic motivation.
- Inclusivity: Cooperative mechanics outperform competitive ones in collectivist cultures.



- Sustainability: Dynamic content updates and reward diversity prevent fatigue.

## 5. Discussion

### 5.1 Comparative Analysis

Both approaches advance motivation and performance, but their mechanisms differ. Gamification leverages extrinsic motivators, effective for routine tasks and microlearning, whereas GBL situates learning in meaningful contexts conducive to higher-order thinking. The synthesis aligns with SDT predictions—GBL better satisfies autonomy and relatedness, while gamification emphasizes competence.

### 5.2 Pedagogical Implications

Instructional designers should:

1. Blend frameworks: Combine gamification for skill drills with GBL for projects and simulations.
2. Prioritize feedback: Embed immediate, formative feedback for both systems.
3. Align with learning goals: Ensure game elements reinforce—not distract from—learning.
4. Promote inclusivity: Avoid over-competition; integrate team-based or narrative tasks.
5. Iterate design: Evaluate and adapt gamified systems to sustain engagement.

### 5.3 Research Gaps

Future studies should employ longitudinal and mixed-methods designs to track motivation and retention over time. Comparative research across disciplines and demographics remains limited, as does exploration of AI-driven adaptive gamification for personalized learning.

## 6. Conclusion

Gamification and game-based learning each offer valuable pathways for enhancing engagement and mastery in online education. Gamification excels at sustaining short-term participation and measurable task performance, whereas GBL cultivates intrinsic motivation, collaboration, and deep understanding. When thoughtfully integrated, these frameworks can transform online learning into an immersive, inclusive, and enduring educational experience. Future research should examine hybrid models that combine gamified reinforcement with immersive, narrative-driven learning design for lasting impact.

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