

# Gamification Applications in Education, Health, Finance, and Marketing: A Bibliometric and Systematic Review

*Gamification: A  
Bibliometric and  
Systematic Review*

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## **ABSTRACT**

*Gamification, the use of game design elements in non-game contexts, has gained significant attention for enhancing motivation, engagement, and behavioral change across various fields. This study aims to examine the current state of gamification research, focusing on its applications, trends, and gaps in education, health, finance, and marketing. The research employs a quantitative approach, using the Preferred Reporting Items for Systematic Reviews and Meta-analyses method and VOSviewer software to analyze 34 studies from the Scopus database, spanning 2015 to 2024. Gamification effectively boosts user engagement by incorporating elements like points, badges, and challenges in diverse domains. In education, it improves learning outcomes through interactive technologies. In health, it promotes adherence to wellness goals, while in finance, it encourages financial literacy. In marketing, gamification fosters eco-friendly behaviors and customer loyalty. The findings reveal a steady increase in publications, from 1,582 in 2015 to 11,949 in 2024, with key contributions from the United States and China. However, gaps remain in understanding long-term impacts and personalized strategies. This review concludes that gamification is a powerful tool for driving engagement, but further empirical research is needed to validate its long-term effectiveness and adaptability across diverse user groups.*

**Keywords:** Education, Engagement, Gamification, Marketing, Motivation, Prisma, Systematic Literature Review.

## **ABSTRAK**

*Gamifikasi, penggunaan elemen desain gim dalam konteks non-gim, telah mendapatkan perhatian signifikan untuk meningkatkan motivasi, keterlibatan, dan perubahan perilaku di berbagai bidang. Studi ini bertujuan untuk mengkaji status terkini penelitian gamifikasi, dengan fokus pada aplikasi, tren, dan kesenjangannya dalam pendidikan, kesehatan, keuangan, dan pemasaran. Penelitian ini menggunakan pendekatan kuantitatif, menggunakan metode Preferred Reporting Items for Systematic Reviews and Meta-analyses dan perangkat lunak VOSviewer untuk menganalisis 34 studi dari basis data Scopus, yang mencakup tahun 2015 hingga 2024. Gamifikasi*

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*secara efektif meningkatkan keterlibatan pengguna dengan menggabungkan elemen-elemen seperti poin, lencana, dan tantangan dalam beragam domain. Dalam pendidikan, gamifikasi meningkatkan hasil pembelajaran melalui teknologi interaktif. Dalam kesehatan, gamifikasi mendorong kepatuhan terhadap tujuan kesejahteraan, sementara dalam keuangan, gamifikasi mendorong literasi keuangan. Dalam pemasaran, gamifikasi mendorong perilaku ramah lingkungan dan loyalitas pelanggan. Temuan ini menunjukkan peningkatan yang stabil dalam jumlah publikasi, dari 1,582 pada tahun 2015 menjadi 11,949 pada tahun 2024, dengan kontribusi utama dari Amerika Serikat dan Tiongkok. Namun, masih terdapat kesenjangan dalam memahami dampak jangka panjang dan strategi personalisasi. Tinjauan ini menyimpulkan bahwa gamifikasi merupakan alat yang ampuh untuk mendorong keterlibatan, tetapi penelitian empiris lebih lanjut diperlukan untuk memvalidasi efektivitas jangka panjang dan kemampuan adaptasinya di berbagai kelompok pengguna.*

**Kata kunci:** *Pendidikan, Keterlibatan, Gamifikasi, Pemasaran, Motivasi, Prisma, Tinjauan Literatur Sistematis*

## INTRODUCTION

Gamification is a relatively new research area that has gained significant attention across various disciplines. The term gamification refers to the application of game design elements in non-game contexts to enhance user engagement, motivation, and behavior change (Kapp, 2012; Nendi, 2024). This emerging concept blends elements such as points, badges, leaderboards, and challenges to create interactive and rewarding experiences in fields like education, health, finance, and marketing (Seaborn & Fels, 2015). Rapid advancements in gamification technology have shifted business dynamics toward an economy that rewards engagement, making it essential for companies to adapt to this new environment to remain competitive (Koivisto & Hamari, 2019; Farhan et al., 2023; Getman et al., 2024). By integrating game-like features, organizations can foster highly engaging experiences through digital platforms and reward mechanisms, which are central to the gamification process (Liu et al., 2017; Koivisto & Hamari, 2019; Christopoulos & Mystakidis, 2023). Since its introduction around 2010, gamification has attracted both academic researchers and industry practitioners, highlighting its potential to influence individual and collective behaviors in diverse settings (Xi & Hamari, 2019).

The application of gamification spans multiple industries, transforming how organizations interact with users. In education, gamification employs interactive technologies to improve learning outcomes by making them more engaging and enjoyable (Dicheva et al., 2015; Sanmugan et al., 2015; Saleem et al., 2022). In health, it encourages adherence to wellness goals, promoting healthier lifestyles through fun and competitive elements. In finance, gamification supports financial literacy and responsible money management, while in marketing, it fosters customer loyalty and eco-friendly behaviors (Huotari & Hamari, 2017). According to a report by Precedence Research (2024), the global gamification market was valued at USD 16.29 billion in 2024 and is expected to grow to USD 190.87 billion by 2034, with a Compound Annual Growth Rate (CAGR) of 27.90%. This growth reflects the increasing adoption of gamification in organizational strategies, such as employee training and customer engagement, particularly during global crises like the COVID-19 pandemic, where e-learning and task-based activities became critical.

Several game elements are commonly used in gamification to drive engagement. Kocadere and Çağlar (2018) identify key elements such as competition, where users earn points displayed on leaderboards; prizes, which reward users for achieving specific milestones; collaboration, which enhances teamwork in completing tasks; and development, which motivates users by offering progressive challenges to maintain their interest. These elements create dynamic experiences that prevent boredom and sustain user commitment. For instance, companies like Deloitte have successfully implemented gamification in training programs, reducing employee learning time by 50% (Dale, 2014).

Such examples demonstrate gamification's ability to enhance efficiency and engagement, making it a powerful tool for organizations seeking to improve performance and user satisfaction.

Despite its growing popularity, gaps remain in understanding the long-term effectiveness and personalization of gamification strategies. According to Park et al. (2019), while gamification enhances short-term engagement and knowledge comprehension in educational settings, its impact on sustained behavioral change is underexplored. Similarly, Xi and Hamari (2019) note that limited research examines how tailored gamification approaches, such as dynamic rewards or personalized challenges, affect diverse user groups across industries. These gaps highlight the need for further investigation into how gamification can foster long-term outcomes and adapt to individual user needs. The objective of this study is to conduct a systematic literature review to examine the applications of gamification in education, health, finance, and marketing, using the PRISMA method and VOSviewer analysis, to identify key trends, research gaps, and future directions in this field.

This systematic review aims to provide a comprehensive overview of gamification's impact by analyzing 34 studies from the Scopus database (2015–2024). By mapping publication trends, key contributors, and thematic clusters, this study seeks to address the identified research gaps and offer insights into how gamification can be optimized for sustained engagement and behavioral change across diverse contexts.

## **LITERATURE REVIEW**

### **Theoretical Foundation of Gamification**

Gamification has emerged as a rapidly expanding research domain, grounded in the idea that game design elements can be embedded into non-game settings to enhance engagement, motivation, and behavioral outcomes (Kapp, 2012; Nendi, 2024). Its theoretical basis is closely tied to the role of core game elements, such as points, badges, leaderboards, progress tracking, levels, avatar development, and structured challenges which function as motivational drivers by activating both intrinsic and extrinsic motivational processes (Lounis et al., 2013; Park et al., 2019). These mechanics work by creating feedback loops that reinforce desired behaviors, a principle aligned with behaviorist learning theories. Research in education and marketing further demonstrates that gamified systems enhance intrinsic motivation by fostering a sense of competence through progress feedback and strengthening relatedness through social features such as competition or collaboration (Eisingerich et al., 2019). Empirical evidence also shows that gamification can increase short-term behavioral change, for instance, boosting exercise frequency or improving task participation (Tu et al., 2019; Ozdamli & Milrich, 2023).

Beyond motivation, gamification contributes to usability and experiential quality. Studies indicate that gamified environments improve perceived enjoyment, system usability, and user engagement, supporting theoretical links to technology acceptance frameworks (Basten, 2017). However, scholars also highlight that while gamification is effective for immediate engagement, its long-term influence remains uncertain, raising important theoretical questions about the sustainability of reinforced behaviors (Dichev & Dicheva, 2017; Matthews et al., 2024). Additionally, individual differences, such as age, preferences, and demographic characteristics, have been shown to moderate gamification's effectiveness (Çera et al., 2020), emphasizing that its impact is not universal but shaped by user heterogeneity. Together, these insights position gamification as a multidimensional mechanism that operates through cognitive, emotional, and behavioral pathways.

### **Gamification Applications in Key Sectors**

Gamification has emerged as an influential strategy across education, health, finance, and marketing, offering benefits that extend beyond entertainment by enhancing engagement, motivation, and behavioral outcomes. In the education sector, gamification has demonstrated strong potential for improving learning effectiveness. Alcivar and Abad

(2016) show that ERP learners trained with gamified tools perform better and report higher satisfaction than those using traditional methods. Similarly, Park et al. (2019) find that elements such as levels, avatar progression, and visual feedback enhance cognitive effort in IT training. Basten (2017) further notes that gamified corporate learning increases motivation and trust while reducing training time and costs, although Dichev and Dicheva (2017) caution that long-term impacts remain uncertain, indicating the need for longitudinal research. In the health sector, gamification has been shown to encourage sustained physical activity by making routines more enjoyable and socially engaging. Ozdamli and Milrich (2023) report that gamified fitness applications help users overcome motivational barriers, while features like leaderboards and progress tracking foster consistent exercise behavior (Tu et al., 2019; Neupane et al., 2021; Kim et al., 2023). Yet, research on long-term lifestyle changes remains limited, with studies emphasizing the short-term nature of many outcomes (Chiauzzi et al., 2015; Matthews et al., 2024).

Gamification also plays a growing role in finance, where it enhances user engagement with digital financial services. Baptista and Oliveira (2017) find that gamified mobile banking features increase user satisfaction and adoption, a trend supported by Yang et al. (2023), who show that gamified mobile wallets improve both efficiency and entertainment value. Nevertheless, concerns persist regarding long-term financial behavior and the limited exploration of gamification within advanced fintech ecosystems (Çera et al., 2020). In marketing, gamification strengthens consumer engagement and purchasing intentions. Lounis et al. (2013) reveal that gamified eco-friendly shopping promotes participation, while Conaway and Garay (2014) identify progress paths and rewards as central engagement drivers. Research also shows that gamified loyalty programs enhance digital sales and retention, although gaps remain regarding consumer resistance and personalization in gamified campaigns (Lucassen & Jansen, 2014; Eisingerich et al., 2019; Rocha et al., 2020).

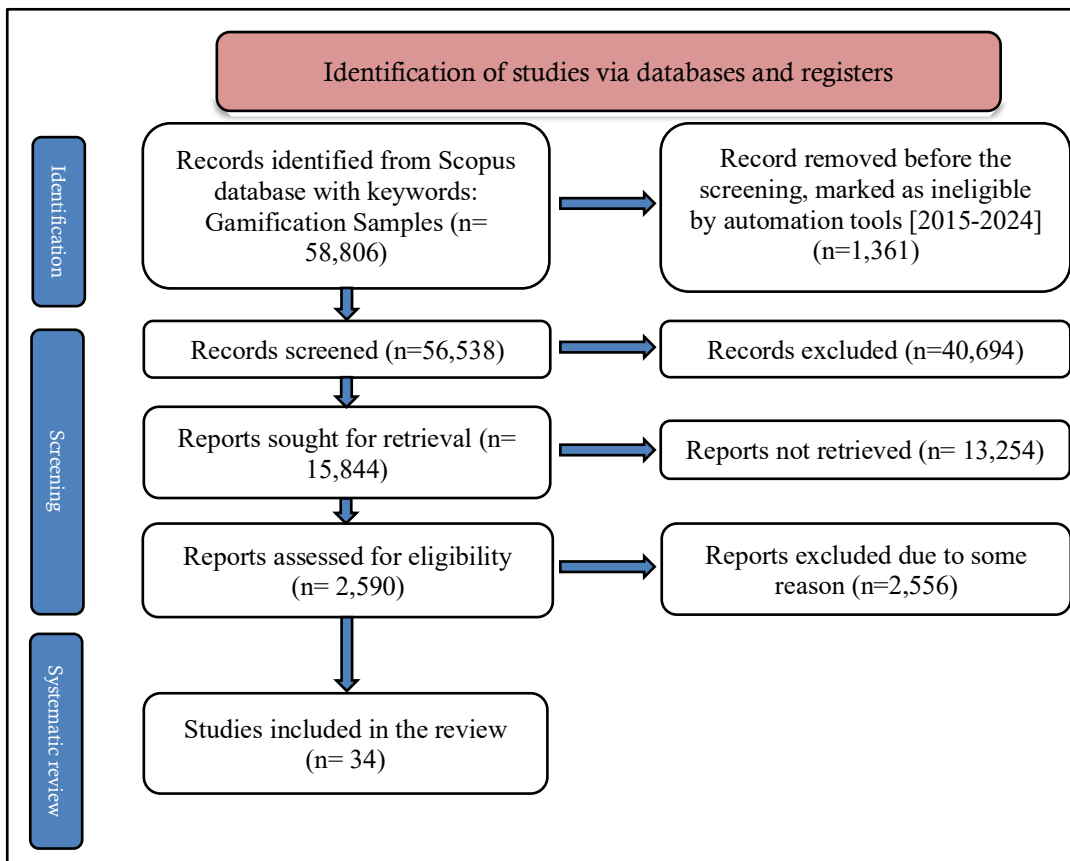
### **Engagement and Motivation**

The literature indicates that engagement and motivation in gamification are largely shaped by the integration of core elements adapted from contemporary video game design. Components such as points, badges, progress indicators, levels, quests, leaderboards, avatars, rules, challenges, and real-time feedback form the essential building blocks that encourage active participation, a sense of progression, healthy competition, and user satisfaction (Hamari et al., 2014; Silic et al., 2020). These features operate as motivational affordances, initiating psychological responses that subsequently lead to desired behavioral outcomes. The widely referenced three-stage framework, motivational affordances, psychological outcomes, and behavioral outcomes explains how gamification influences users by first activating motivational triggers that shape cognitive and emotional reactions before translating into concrete behaviors (Reem, 2024)

This process is closely connected to the dynamics of intrinsic and extrinsic motivation. Reward-based elements can strengthen extrinsic motivation and drive short-term behavioral improvements (Jones et al., 2014). However, several studies caution that an overreliance on external rewards may diminish intrinsic motivation over time, a concern grounded in organismic integration theory (Nicholson, 2014). To foster sustained engagement, gamification must align with the principles of self-determination theory, particularly by addressing users' needs for autonomy, mastery, and relatedness (Rigby, 2015). Purpose and goal-setting also play a significant role in maintaining long-term involvement, as they provide users with meaningful and self-congruent progress (Macey & Hamari, 2024). The literature emphasizes that the effectiveness of gamification depends not only on the game elements embedded within a system but also on their ability to activate deeper psychological mechanisms that support enduring motivation and engagement.

**RESEARCH METHODS**

This study employs a systematic literature review to investigate the applications of gamification across various domains, using the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) method to ensure a structured and transparent approach. The PRISMA method, introduced in 2009, provides a robust framework for conducting systematic reviews through stages such as query formulation, domain identification, systematic search, critical analysis, interpretation, and reporting (Pati & Lorusso, 2018). This method was chosen for its widely recognized checklist and flowchart, available at <https://www.prisma-statement.org/>, which guide researchers in selecting and analyzing relevant studies. By adopting PRISMA, this study ensures a rigorous and replicable process to map the landscape of gamification research, focusing on its trends and gaps.



**Figure 1.** PRISMA Flow of the Present Study

The data for this review were sourced from the Scopus database, selected for its high-quality standards and comprehensive coverage of peer-reviewed academic articles (Pedreira et al., 2015). To align with the study’s focus, the search used the keyword “gamification” to identify relevant publications from 2015 to 2024, ensuring the inclusion of recent and updated research on the topic. This time frame was chosen to capture the latest developments in gamification across education, health, finance, and marketing. As shown in Figure 1, the search process began with identifying 58,806 records using the keyword “gamification,” followed by filtering and screening stages. After applying automation tools to remove ineligible records, such as those outside the 2015–2024 period, 1,361 records were excluded. Subsequent screening reduced the pool to 56,538 records, with 15,844 reports sought for retrieval. After assessing eligibility based on predefined criteria, 2,590 records were evaluated, and 34 studies were ultimately included in the review. Figure 2 illustrates this systematic selection process, guided by PRISMA, ensuring that only high-quality, relevant studies were analyzed.

To analyze the selected studies, this research utilized VOSviewer 1.6.20 to construct bibliometric networks that map relationships between titles, authors, and institutions (Donthu et al., 2021). VOSviewer's co-occurrence analysis was employed to visualize connections between keywords, such as gamification, engagement, and specific domains like education and marketing, with nodes representing topics and their proximity indicating the strength of relationships (Rousseau & Rousseau, 2021). This approach helped identify thematic clusters and research trends, providing insights into the evolution of gamification studies. The inclusion criteria required studies to focus on gamification applications, have transparent methodologies, be published in English, and appear in reliable sources between 2015 and 2024. Exclusion criteria eliminated non-peer-reviewed materials, such as editorials, keynotes, and unpublished works like theses or books. This rigorous methodology ensures a comprehensive and credible analysis of gamification's research landscape, supporting the identification of key trends and gaps for future exploration.

## RESULTS

### Publication Trends in Gamification Research

This section presents the findings from a systematic literature review of gamification studies, focusing on quantitative data derived from the Scopus database (2015–2024) and analyzed using the PRISMA method and VOSviewer 1.6.20. The results highlight publication trends, contributing countries and affiliations, key authors, and thematic clusters in gamification research. These findings provide a clear picture of the growth and scope of gamification studies, laying the groundwork for further discussion on their implications (Donthu et al., 2021). By mapping the bibliometric landscape, this section aims to identify patterns and key contributors in the field, ensuring a data-driven foundation for understanding gamification's research trajectory.

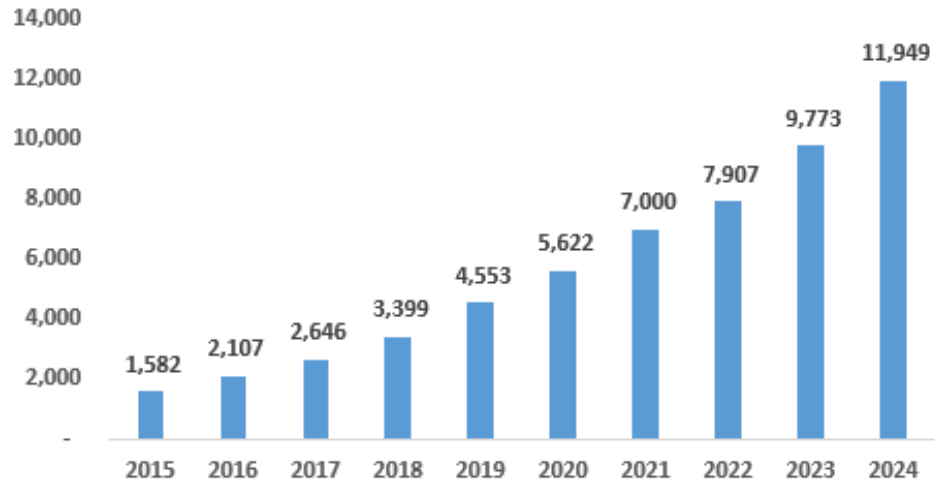


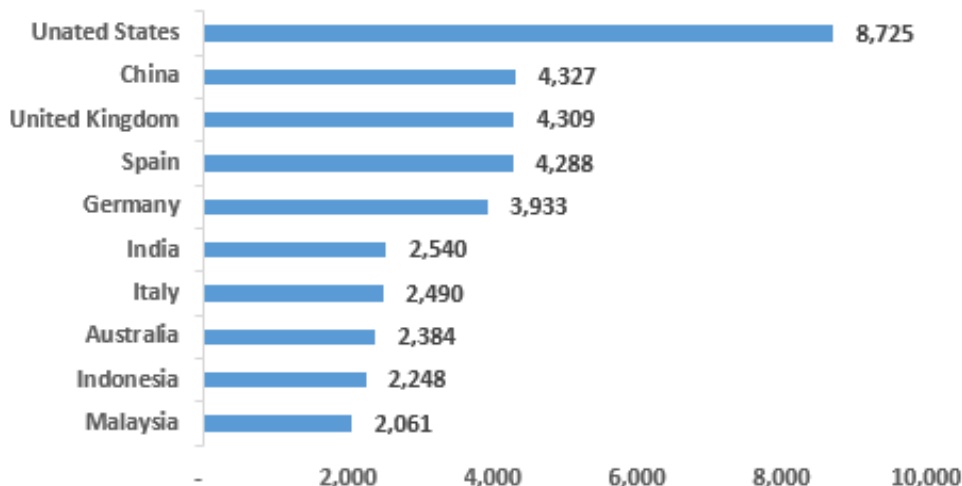
Figure 2. Publications Trend in Gamification

The analysis revealed a significant increase in gamification research over the past decade. As shown in Figure 2, the number of publications on gamification has grown steadily from 2015 to 2024. In 2015, there were 1,582 publications, which increased to 2,107 in 2016 and 2,646 in 2017. The upward trend continued with 3,399 publications in 2018 and 4,553 in 2019. The year 2020 saw 5,622 publications, followed by 7,000 in 2021 and 7,907 in 2022. In 2023, the number reached 9,773, and by 2024, a peak of 11,949 publications was recorded, reflecting a robust growth in academic interest (Koivisto & Hamari, 2019). This trend, illustrated in Figure 2, aligns with the global gamification market's growth, projected to rise from USD 16.29 billion in 2024 to USD 190.87 billion by 2034, as reported by Precedence Research (2024). The consistent increase suggests that

gamification is becoming a prominent research area across multiple disciplines, driven by its applications in various sectors.

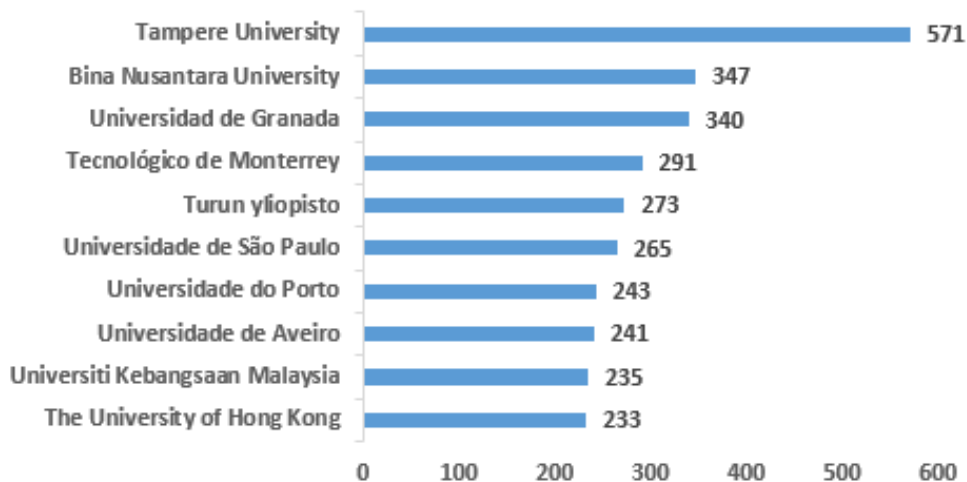
**Global Contribution and Key Influential Authors**

The geographic distribution of gamification research highlights contributions from several countries. Figure 3 displays the top 10 countries with the most publications, led by the United States with 8,725 publications. China follows with 4,327 publications, and the United Kingdom ranks third with 4,309. Other notable contributors include Spain (4,288 publications), Germany (3,933), India (2,540), Italy (2,490), Australia (2,384), Indonesia (2,248), and Malaysia (2,061).



**Figure 3.** Top 10 Countries with the Most Publications

This distribution, shown in Figure 4, indicates a global interest in gamification, with North America, Europe, and Asia as key research hubs. The high output from the United States and China reflects their strong academic infrastructure and investment in technology-driven research, while emerging contributions from Indonesia and Malaysia suggest growing interest in gamification in Southeast Asia (Rousseau & Rousseau, 2021). These findings underscore the widespread adoption of gamification across diverse academic and cultural contexts.



**Figure 4.** Top 10 Affiliates with the Most Publications

Affiliations contributing to gamification research also show a global spread. As presented in Figure 4, Tampere University leads with 571 publications, followed by Bina Nusantara University (Indonesia) with 347 and Universidad de Granada (Spain) with 340. Other significant contributors include Tecnológico de Monterrey (291 publications), Turun Yliopisto (273), Universidade de São Paulo (265), Universidade do Porto (243), Universidade de Aveiro (241), Universiti Kebangsaan Malaysia (235), and The University of Hong Kong (233). Figure 5 highlights the diversity of institutions, with strong representation from Europe, Latin America, and Asia. Tampere University's leading role may be attributed to its focus on technology and innovation, while Bina Nusantara University's contribution reflects Indonesia's growing research output in gamification (Pedreira et al., 2015). These affiliations demonstrate the collaborative and interdisciplinary nature of gamification research, spanning various academic environments.

Table 1. Top 10 Most Cited Authors

| No. | Author                | Citations |
|-----|-----------------------|-----------|
| 1   | Hamari, J.            | 274       |
| 2   | Isotani, S.           | 83        |
| 3   | Orji, R.              | 82        |
| 4   | Nacke, L. E.          | 66        |
| 5   | Laato, S.             | 62        |
| 6   | Oliveira, W.          | 54        |
| 7   | Fonseca, D.           | 49        |
| 8   | Prandi, C.            | 48        |
| 9   | Marconi, A.           | 48        |
| 10  | García-Peñalvo, F. J. | 48        |

Key authors contributing to gamification research were identified based on citation counts. Table 1 lists the top 10 most cited authors, with Hamari, J. leading at 274 citations. Other notable authors include Isotani, S. (83 citations), Orji, R. (82), Nacke, L. E. (66), Laato, S. (62), Oliveira, W. (54), Fonseca, D. (49), Prandi, C. (48), Marconi, A. (48), and García-Peñalvo, F. J. (48). As shown in Table 1, Hamari, J.'s high citation count reflects the quality and influence of his work in shaping gamification research. The diversity of authors from different regions and disciplines further supports the global and interdisciplinary nature of the field (Koivisto & Hamari, 2019). These citation patterns indicate that a small group of researchers have significantly influenced the direction of gamification studies, particularly in areas like motivation and user engagement.

### Thematic and Network Visualization of Gamification Research

Bibliometric analysis using VOSviewer 1.6.20 provided insights into the thematic structure of gamification research. Figure 5 illustrates the network visualization of gamification publications, revealing key clusters such as learning, education, marketing, sustainability, and human factors. Each cluster represents a thematic area, with nodes indicating subtopics like mobile applications, academic achievement, and sustainable development. The proximity of nodes reflects the strength of their relationships, showing that education and learning are central themes, closely linked to engagement and motivation (Donthu et al., 2021).

Additionally, Figure 6 presents the density visualization of gamification in the banking sector, highlighting keywords like technology, service quality, consumer behavior, and game dynamics. A denser, yellow-colored area indicates higher keyword frequency, with gamification as the central topic surrounded by related concepts. These visualizations, shown in Figures 5 and 6, confirm that gamification research is interconnected across multiple domains, with strong emphasis on user engagement and technology-driven applications (Rousseau & Rousseau, 2021).



## DISCUSSION

The results of this systematic literature review reveal the rapid growth and global reach of gamification research from 2015 to 2024. The steady increase in publications, from 1,582 in 2015 to 11,949 in 2024, reflects growing academic interest in gamification's ability to enhance engagement and motivation across various domains (Koivisto & Hamari, 2019). This growth aligns with the expanding gamification market, projected to reach USD 190.87 billion by 2034, suggesting that gamification is not only an academic focus but also a practical tool for industries (Precedence Research, 2024). The diversity of contributing countries and affiliations, as shown in Figures 3 and 4, indicates that gamification is a global phenomenon, with significant contributions from the United States, China, and emerging hubs like Indonesia. These findings provide a foundation for understanding how gamification is shaping user experiences in education, health, finance, and marketing.

According to Kocadere and Çağlar (2018), gamification's effectiveness stems from its use of elements like points, badges, and leaderboards, which create engaging and motivating experiences. The network visualization in Figure 6 highlights thematic clusters such as learning, marketing, and human factors, showing that gamification is deeply connected to user engagement and behavioral outcomes. For instance, the dense clustering of education-related keywords suggests that gamification is widely applied to enhance learning experiences, supporting findings from studies that report improved motivation in educational settings (Armstrong & Landers, 2018). However, the visualization also reveals gaps in exploring long-term outcomes, particularly in health and finance, where short-term engagement is well-documented but sustained behavior change is less studied. This aligns with the need for research on how gamification can maintain user motivation over extended periods, especially for diverse demographic groups.

The density visualization in Figure 6, focusing on the banking sector, underscores gamification's role in enhancing service quality and consumer behavior through game dynamics. Markopoulos et al. (2015) note that gamified training in technical fields, such as engineering, improves problem-solving skills by incorporating interactive elements like 3D animations. Similarly, in marketing, gamified loyalty programs with rewards and progress tracking foster customer retention, as seen in successful corporate applications (Eisingerich et al., 2019). Yet, the literature highlights a gap in understanding why some users resist gamified systems, particularly in marketing, where personalized strategies could improve acceptance (Szendrői et al., 2020). In health, Ozdamli and Milrich (2023) emphasize that gamification makes fitness routines more enjoyable, but its application in mental health, such as for stress or anxiety management, remains underexplored. These gaps suggest that while gamification is effective in driving initial engagement, its long-term impact and adaptability to diverse user needs require further investigation.

Gamification satisfies intrinsic needs, such as autonomy and competence, which explains its success across domains (Xi & Hamari, 2019). However, the limited focus on personalization, such as tailored rewards or challenges, restricts its effectiveness for diverse populations. For example, in finance, gamified tools improve financial literacy, but their ability to foster long-term habits like saving or debt reduction is not well-studied. The high citation count of authors like Hamari, J. reflects the influence of such insights in shaping gamification research. The global spread of contributors, as seen in Figures 4 and 5, further suggests that cultural and socioeconomic factors should be considered to optimize gamification's impact. These findings highlight the need for future research to explore personalized and culturally sensitive gamification strategies to maximize engagement and behavioral outcomes.

The implications of these findings are significant for both researchers and practitioners. For researchers, the identified gaps in long-term outcomes and personalization offer opportunities to design studies that address sustained engagement and diverse user needs. Practitioners can leverage gamification's proven effectiveness in education and marketing to develop innovative training programs and customer loyalty initiatives. In health and finance, integrating gamified elements with emerging technologies, such as AI or

wearables, could enhance user experiences and outcomes. By addressing these gaps, gamification can evolve into a more inclusive and impactful tool, driving meaningful behavioral change across industries.

## CONCLUSION

This systematic literature review highlights the significant growth of gamification research from 2015 to 2024, with publications increasing from 1,582 to 11,949, reflecting its rising importance across education, health, finance, and marketing. Gamification has emerged as a powerful tool for driving engagement, motivation, and behavioral change by integrating game elements like points, badges, and challenges into non-game contexts. The global spread of research, led by countries like the United States and China, and institutions like Tampere University, shows its widespread adoption. Thematic clusters, such as learning and consumer behavior, reveal gamification's diverse applications, particularly in enhancing user experiences and outcomes. When designed thoughtfully, gamification has the potential to positively influence behavior, improve learning experiences, and address global challenges in various industries.

The findings offer important implications for both researchers and practitioners, encouraging the development of innovative gamified solutions to boost engagement and achieve meaningful outcomes. However, this study is limited by its focus on Scopus-indexed articles from 2015 to 2024, which may exclude relevant research from other databases or earlier periods. Additionally, the review primarily analyzed quantitative trends, leaving room for deeper qualitative insights. Future research should explore personalized gamification strategies to address diverse user needs, investigate long-term behavioral impacts in health and finance, and examine cultural influences to create more inclusive applications. These efforts can help unlock gamification's full potential as a transformative tool across multiple domains.

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