

# Uncovering the Gaps: A Bibliometric Review of Halal Education in Game-Based Learning

**Norazilawati Md Dahlal**

*Institute of Halal Management, Islamic Business School (IBS),  
Universiti Utara Malaysia*

**Junainah Idris \***

*Faculty of Economics, Accountancy and Management,  
Universiti Islam Selangor, Malaysia  
[junainah@uis.edu.my](mailto:junainah@uis.edu.my)*

**Nadzirah Mohd Fauzi**

*Faculty of Economics, Accountancy and Management,  
Universiti Islam Selangor, Malaysia*

**Mohd Fadhli Ab Rahman**

*Halal Advisory and Research Institute Selangor,  
Universiti Islam Selangor, Malaysia*

**Syafiqullah Lukman**

*International Institute for Halal Research and Training (INHART),  
International Islamic University of Malaysia*

*\* Corresponding Author*

## Abstract

**Purpose:** This study investigates the visibility and thematic integration of Halal education within the global landscape of Game-Based Learning (GBL) research from 2015 to early 2025. While GBL has rapidly expanded as a pedagogical innovation across diverse disciplines, its application to culturally specific and religiously grounded domains, particularly Islamic pedagogy and Halal literacy, remains a critically underexplored area.

**Design/methodology/approach:** Using a bibliometric approach, this study analyzed 8,218 open-access, English-language publications indexed in Scopus over 11 years (2015 to 2025). Tools such as OpenRefine, Biblioshiny (RStudio), and Bibliomagika were employed to map publication trends, keyword structures, citation metrics, and thematic trajectories.

**Findings:** The findings reveal that, despite the exponential growth of GBL research and the emergence of advanced educational technologies, Halal-related themes are largely absent from high-frequency keywords, source titles, and trend topics. Only a few isolated studies address Islamic or Shariah-compliant content, none of which are featured in leading GBL publication outlets. This gap indicates both a missed opportunity and a strategic area for development, given the increasing global demand for faith-based, ethical, and values-driven education.

**Research limitations/implications:** This study is limited to publications indexed in Scopus and restricted to English-language, open-access documents. Broader coverage across multiple databases and inclusion of non-English sources may provide deeper insights into the presence of Halal education in GBL.

**Practical implications:** The study proposes five strategic directions for embedding Halal values into GBL initiatives: co-design of compliance simulations, curriculum integration

guided by Maqasid Shariah, gamification of Islamic storytelling, development of Shariah-compliant digital therapeutic tools, and alignment of GBL design with values-driven education policies. These strategies offer educators, developers, and policy-makers actionable pathways for integrating Halal perspectives into digital learning.

**Originality/value:** As the first systematic bibliometric review of Halal education within GBL, this study provides a foundational roadmap for embedding Islamic and Halal principles into the evolving field of culturally responsive digital learning. It contributes to both academic scholarship and practical innovation by bridging the gap between global GBL trends and faith-based educational needs.

**Keywords:** Game-Based Learning, Educational Games, Halal Education, Islamic Pedagogy, Bibliometric Analysis

## Introduction

Over the past decade, Game-Based Learning (GBL) has emerged as a transformative educational approach that combines digital interactivity with pedagogical objectives. Rooted in educational theories such as constructivism, experiential learning, and self-determination, GBL enables active and meaningful engagement through structured game environments (Ekin & Gul, 2022; Dikmen & Bahadır, 2022). Its adoption has grown significantly across diverse fields, including STEM, language acquisition, and medical education, reflecting a global shift toward learner-centered and technology-enhanced instruction (Karagöz & Ateş, 2022).

Game-Based Learning (GBL) refers to the use of digital or non-digital game environments as structured learning tools aimed at achieving specific educational outcomes. Game-Based Learning (GBL) offers an interactive and engaging approach to delivering Halal education by transforming key principles into practical, scenario-based activities. Through digital games, simulations, or role-playing, learners can experience real-life Halal practices such as food handling, certification processes, supply chain monitoring, or consumer awareness in a risk-free and motivating environment (Plass, Homer, & Kinzer, 2015). Unlike gamification, which incorporates isolated game elements like points or badges into conventional activities, GBL involves creating or applying complete games with defined rules, narratives, and feedback mechanisms to support deep learning. It emphasizes experiential engagement, learner autonomy, and goal-oriented progress, making it especially suitable for diverse and dynamic learning contexts (Plass et al., 2015). Despite its wide-ranging applications and growing body of research, the incorporation of GBL into culturally specific and religiously grounded educational contexts remains limited. In particular, Halal education, which includes Shariah-compliant knowledge, ethical literacy, and faith-based practices, has not received proportionate attention within the broader GBL discourse. This is especially concerning given the increasing global Muslim population and the parallel demand for innovative, culturally responsive digital learning tools that align with Islamic values (Rosyad, 2019).

Early examples suggest that the pedagogical structure of GBL holds strong potential for use in Islamic and Halal-related education, including through simulation, ethical reasoning, and vocational training. However, the absence of systematic research and the lack of representation in high-impact academic platforms point to a critical thematic gap. Addressing this omission is necessary not only to broaden the inclusivity of digital education but also to contribute to the advancement of Shariah-aligned pedagogical innovation. This study aims to perform a bibliometric analysis of Scopus-indexed GBL literature published from 2015 to 2025, focusing specifically on the visibility and integration of Halal education. By examining author

keywords, publication trends, thematic evolution, and citation networks, the study seeks to uncover patterns of inclusion and exclusion related to Islamic pedagogical themes. The findings are expected to inform future research directions and support the development of culturally embedded educational technologies. To guide the investigation, the following research questions are proposed. First, what are the publication trends and thematic structures of Game-Based Learning (GBL) research from 2015 to 2025? Second, to what extent are Halal education, Islamic pedagogy, or Shariah-compliant themes represented in the existing GBL literature? Third, how do dominant GBL trends conceptually align with the content of Halal education? Finally, what strategic directions can be proposed to integrate Halal education into future GBL research and development agendas.

### **Literature Review**

The literature review provides an overview of Halal education, the current landscape of Game-Based Learning (GBL) research, and examines how it intersects or fails to intersect with Islamic education, particularly Halal literacy. To contextualize the bibliometric analysis, this section reviews foundational theories and global trends in GBL, identifies gaps in its application to Islamic pedagogical contexts, and synthesizes previous bibliometric studies on the topic. These discussions serve as a conceptual foundation for evaluating the visibility and representation of Halal education within the GBL domain.

### ***Halal Education***

The conceptual basis of Halal education extends beyond dietary laws and business regulations; it represents a commitment to teaching and passing down ethical, spiritual, and legal Islamic values through organized learning. In the wider scope of Islamic education, Halal education is increasingly seen as a way to meet the rising demand for faith-based curricula that incorporate the Maqasid al-Shariah (objectives of Islamic law) into everyday life, consumer habits, and professional activities. Recent studies highlight the growth of Halal education within formal academic settings. Salman et al. (2019) found that over 70% of students in Indonesian Islamic higher education institutions had received some form of Halal instruction, but less than half understood its link to the Maqasid al-Shariah. This indicates a continuing gap between exposure and deep understanding, showing that institutional presence alone does not guarantee comprehensive Halal literacy (Salman et al., 2019).

Educational frameworks have also begun to integrate Halal themes into professional training. For example, Palanisamy et al. (2017) highlighted deficiencies in pharmacy and medical curricula concerning Halal pharmaceuticals, revealing how insufficient Halal-related content may impede future Muslim healthcare professionals from practicing in accordance with Islamic ethical standards (Palanisamy et al., 2017). Similar gaps were identified in vocational education, where the demand for Halal certification and auditing skills is rising in tandem with industry expectations, but curriculum alignment remains patchy (Pratama et al., 2023).

From a pedagogical standpoint, Halal education is increasingly linked to character development and global citizenship. Kartika (2018) emphasized that Halal principles, grounded in honesty, trust, and ethical accountability, are essential for cultivating morally responsible learners capable of navigating pluralistic societies (Kartika, 2018). Furthermore, Halal literacy has been explored in early science education contexts, where students' understanding of Halal is scaffolded through real-world topics like food science and health, albeit with varying levels of success (Kulsum & Rohman, 2025).

However, the bulk of these efforts remains confined to traditional, didactic learning environments. There is scant empirical evidence on the integration of Halal education within digital, interactive, or gamified learning models. In fact, current Halal education efforts tend to prioritize certification mechanisms and awareness campaigns over learner engagement strategies grounded in digital pedagogies (Maliya et al., 2024). This reflects a critical methodological inertia: the failure to adapt Halal pedagogy to 21st-century digital competencies and culturally responsive teaching tools, such as game-based learning (GBL). Moreover, while some studies emphasize the potential of integrating Fiqh al-Awlawiyat (jurisprudence of priorities) into Halal education to navigate complex ethical terrains, this philosophical advancement has yet to be mirrored in educational technology innovation (Abdurrahman et al., 2025). As a result, learners are still primarily exposed to Halal as a regulatory framework rather than as an embodied ethical practice or an experiential learning journey.

While Halal education has gained ground in formal schooling and professional training, it continues to rely heavily on traditional instructional approaches. Despite broader efforts to increase awareness and integrate Halal principles into curricula, there remains a noticeable lack of innovation in how these values are taught. Approaches that encourage active participation, such as game-based learning, interactive simulations, or digital storytelling, are rarely explored in the existing body of work. This gap is particularly significant given the growing recognition of learner-centered pedagogies and the increasing role of technology in education. If Halal education is to resonate with younger, digitally native learners, it must begin to move beyond static content delivery and embrace more engaging, context-driven formats. The next section considers how game-based learning might offer a viable framework for this shift.

### ***Game-Based Learning: Foundations and Pedagogical Relevance***

Game-Based Learning (GBL) has become an influential pedagogical method that integrates game elements to facilitate structured and meaningful learning experiences. Different from gamification, which generally involves discrete game elements deployed in non-game settings, GBL is concerned with the design and implementation of comprehensive game environments for meeting specific learning objectives. Its development is part of a larger education trend toward learner-directed and technology-facilitated pedagogy. The pedagogical foundation of GBL is soundly supported in a broad range of successful learning theories. Constructivism, for example, emphasizes that students construct knowledge actively by being involved in meaningful interactions with the world around them, which is appropriately suited to the interactivity of education games. Kolb's experiential learning theory focuses on learning from concrete experience and reflective observation, both activities enabled through GBL environments. In addition, self-determination theory predicts the motivational appeal of GBL on autonomy, competence, and relatedness as being inherent in learner motivation. More recent bibliometric reviews affirm an increased global research trend on GBL with a uniformly positive trend in academic output. Ekin and Gul (2022) compared 4,488 Scopus-indexed articles published between 1967 and 2021 and concluded that the most frequently discussed issues are gamification and serious games, as well as their effect on motivation and learning outcomes. According to their findings, the United States and Taiwan are at the forefront of contributions, but overseas collaboration is low (Ekin & Gul, 2022). Deeper analysis by Dikmen and Bahadır (2022) identified thematic focuses in tandem. Their bibliometric image of gamification in education classified motivation, competition, and innovation as the running themes. Yet, they also observe that the research world is dispersed, with little interdisciplinary dialogue, especially across cultural and national lines (Dikmen & Bahadır, 2022). Such a

structural constraint indicates that although discipline continues to expand, its subject area is not yet comprehensive or worldwide in scope.

At the primary level, Magpusao (2024) highlighted that gamification and GBL can reach quite far in stretching the motivation and engagement of learners. From a review of 36 Scopus-indexed articles, it was found that GBL tools work best in constructing collaborative learning, particularly if they are designed to match the cognitive and affective developmental ages of young learners. Yet, as the study shows, whilst benefits have been identified, studies focused on the primary level remain underdeveloped (Magpusao, 2024). Nguyen et al. (2023) discussed the application of online games in classrooms and how immediate feedback and rewards contribute to enhancing students' outcomes and motivation. Based on their research, online GBL websites can prove especially beneficial for repetitive topics, provide instant correction, and require long-term motivation. However, they also noted disadvantages like uneven access to technology, poor teacher readiness, and bureaucracy against alternative models of instruction (Nguyen et al., 2024). Critically, increasing literature emphasizes not just the effectiveness of GBL but also contextual and structural issues in influencing use. Although game-based strategies have long-term beneficial impacts on learning results, they demand curriculum models appropriately fitted, trainer training, and availability of technological systems. Additionally, a discernible lack of GBL applications specifically adjusted to culturally or religiously defined educational goals prevents pedagogical applicability diversity. In total, GBL is an empirically supported and theoretically established method of education in today's world. Its congruence with motivational and experiential learning models and theories makes it universally applicable to every field of education. Yet, its true potential is achievable only through the avenues of increased inclusion, institutional support, and contextually adaptive applications. However, despite its proven pedagogical value, GBL remains underutilized in religiously grounded domains such as Islamic or Halal education, a gap explored in the following section.

### ***Game-Based Learning in Islamic and Halal Education***

Game-based learning (GBL) presents a valuable yet underutilized opportunity in the context of Islamic and Halal education. These domains emphasize ethical reasoning, spiritual development, and rule-based literacy areas that could benefit from the interactive and applied nature of educational games. GBL enables learners to engage with values-based content through simulated decision-making and narrative-driven scenarios, offering a shift from passive memorization to active, experiential learning. Abd. Aziz et al. (2024) offer a rare example of this integration, showing how the Halal Vocation Game enhanced learner motivation and understanding of Halal certification in vocational contexts. Such work demonstrates the pedagogical compatibility of GBL with Islamic education goals, including moral reasoning, compliance, and real-world application (Abd. Aziz et al., 2024). However, despite its pedagogical potential, Islamic and Halal education remain largely disconnected from the broader development of GBL. This is not simply a reflection of research scarcity, but of broader structural limitations, including a lack of culturally relevant game content and minimal institutional support for technology-based innovation in religious curricula. Addressing this disconnect requires intentional instructional design, culturally localized content, and closer alignment with established Islamic pedagogical frameworks. In short, GBL is well-positioned to enhance learning in religious and ethical education, but realizing this potential will require targeted research, interdisciplinary collaboration, and greater sensitivity to cultural context. Given the global expansion of Halal-related industries and Islamic schooling, the development



of GBL tools aligned with Shariah principles represents a timely and valuable educational frontier.

### **Bibliometric Studies on GBL: Current Scope and Research Gaps**

While the previous section highlighted the underrepresentation of GBL in Islamic and Halal education, this section reviews existing bibliometric analyses of GBL more broadly. It identifies dominant research clusters, institutional trends, and conceptual gaps, particularly those related to cultural and religious dimensions of learning. Bibliometric analysis has become an essential method for tracing trends, structures of knowledge, and the measurement of the evolution of research into game-based learning (GBL). Using citation analysis, keyword co-occurrence, and authorship networks, bibliometric studies provide a macro-level perspective to complement empirical and theoretical research. Over the past decade, various such analyses have traced the volume and direction of GBL literature with findings that validate its pedagogical value while uncovering enormous research gaps.

A systematic review conducted by Karagöz & Ateş (2022) reviewed 494 articles across the period 2001-2021 in the Web of Science database and depicted that the domain of digital game-based learning (DGBL) has been on a continuous trajectory of growth since the year 2006. Their co-word analysis revealed dominant thematic clusters: “digital game-based learning”, “serious games”, and “gamification”, reflecting a strong focus on learner motivation, engagement, and simulation-based instruction. However, the authors also mentioned the thematic lack of culturally situated or religio-centric models of learning in DGBL research. The most productive institutions in Taiwan, led by National Taiwan University of Science and Technology, were in line with the predominance of East Asian contributions in global GBL literature (Karagöz & Ateş, 2022). This is consistent with the trends observed by Ekin and Gul (2022), who reviewed 4,488 Scopus-indexed papers between 1967 and 2021. They observed an acute spike in GBL-related publications post-2010, particularly in areas such as STEM education, medical training, and language learning. The most common words were “serious games,” “gamification,” and “engagement,” and these reflect general interests with motivation and learning efficacy. However, the same research showed low co-authorship density, reflecting an appearance of dispersed international collaboration and scattered research networks (Ekin & Gul, 2022). Dikmen and Bahadır (2022) also carried out a complementary study with a clear gamification emphasis. They found Spain, the United States, and Bulgaria to be major contributors, and gamification is generally associated with the application of words such as “motivation,” “competition,” and “educational innovation.” The authors uncovered that even though research quantity is increasing, the majority of contributions are centered in technical and higher education areas, with primary education, value-based learning, and culturally sensitive deployments relatively less explored (Dikmen & Bahadır, 2022). This trend is repeated in an in-depth bibliometric review by Magpusao (2024), who authored about GBL in elementary schools. Her report highlighted a lack of such research at the elementary level, despite early education allegedly benefiting most from interactive and participatory pedagogies.

Consequently, Nguyen et al. (2023) noted that despite the obvious impacts of online games on student participation, few bibliometric studies have been conducted on this subject to examine it in detail or to contrast online game-based learning across various educational and cultural systems (Magpusao, 2024; Nguyen et al., 2023). Moreover, bibliometric reviews consistently demonstrate a lack of attention toward religion-based education, ethical literacy, or Halal-themed subjects. Terms like “Islamic education,” “Halal,” or “values-based learning” rarely

appear in top bibliometric clusters, even amidst palpable needs for educational innovation along thematic paths (Ekin & Gul, 2022). This highlights the necessity for research and indicates the demand for bibliometric activities that incorporate diverse cultural and pedagogical perspectives. Although existing bibliometric studies have successfully charted the expansion and evolution of GBL research, they consistently overlook culturally and religiously framed educational objectives. This gap reinforces the need for focused bibliometric inquiries that explore underrepresented areas such as Halal education within the broader educational technology discourse. Table 1 summarizes the literature of bibliometric studies.

Table 1: Literature Matrix of Bibliometric Studies on GBL

*This table summarizes five major bibliometric reviews on Game-Based Learning (GBL). While these studies highlight global publication trends, dominant countries, and common themes such as gamification, serious games, and learner motivation, none explicitly address Halal or Islamic value-based education. The matrix, therefore, provides a comparative baseline, showing the gap between mainstream GBL research and the integration of Halal or value-driven perspectives.*

| Author(s) & Year         | Title / Source   | Focus Area                           | Key Findings   | Relevance to Halal / Value-Based Learning                                      |
|--------------------------|--|--------------------------------------|--|--|
| Ekin & Gul (2022)        | Bibliometric Analysis of Game-Based Research in Educational Research | GBL trends (1967–2021)               | US & Taiwan dominate; frequent terms include <i>serious games</i> , <i>gamification</i> , and low researcher collaboration | No direct link to Halal; useful to understand mainstream GBL clusters          |
| Dinçmen & Bahadır (2022) | Bibliometric Mapping of Gamification in Education                    | Gamification trends                  | Spain & US lead; gamification improves motivation but lacks cross-disciplinary links                                       | General gamification focus; no Islamic or Halal emphasis                       |
| Mapguso (2024)           | Gamification and GBL in Primary Education                            | Early GBL (2013–2023)                | Improves engagement in young learners; Spain leads; limited collaboration  | No Halal relevance; highlights GBL's motivational potential in early education |
| Nguyen et al. (2023)     | Using Online Games in Teaching: A Bibliometric Analysis              | Online GBL in classrooms (2016–2023) | Online games aid performance and engagement; dominance by Western contexts   | Applicable for method, but not value-driven or faith-based content             |
| Karagöz & Ateş (2022)    | Trends in Digital GBL Research: A Bibliometric Analysis              | Global GBL (2001–2021)               | Growth since 2005; focus on motivation and simulation  | Notes the absence of Islamic/value-based themes explicitly                     |

## Methodology

This study adopts a bibliometric approach to examine the visibility and thematic integration of Halal education within Game-Based Learning (GBL) literature published between 2015 and early 2025. Bibliometric analysis is a quantitative method used to systematically analyze scientific literature based on publication metadata such as keywords, authorship, citations, and source titles. It is particularly effective for mapping research trends, identifying thematic gaps, and assessing the evolution of knowledge within interdisciplinary domains such as educational technology and Islamic pedagogy (Donthu et al., 2021; Aria & Cuccurullo, 2017).

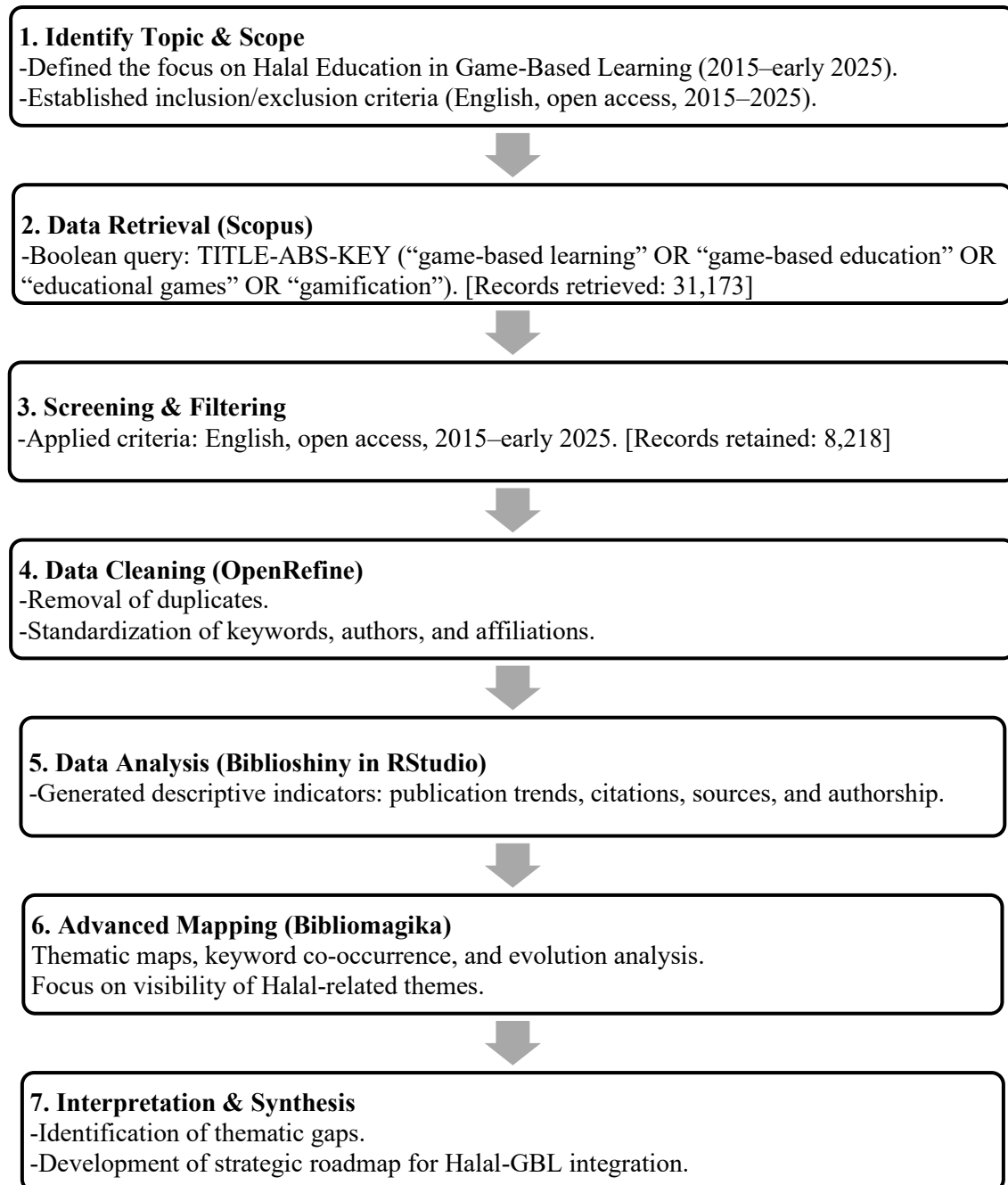


Figure 1: Process Flowchart  
Source: Generated by the author(s)



Figure 1 shows the process flowchart for data. The Scopus database was selected as the primary data source due to its broad coverage of peer-reviewed academic literature and its frequent use in bibliometric research (Burnham, 2006). A Boolean query was constructed to retrieve GBL-related publications using the following string: TITLE-ABS-KEY ("game-based learning" OR "game-based education" OR "educational games" OR "gamification"). The search targeted titles, abstracts, and keywords to maximize the retrieval of relevant documents. The initial query generated 31,173 records. To improve relevance and manageability, the dataset was filtered to include only English-language documents published between 2015 and early 2025 and available as open-access. This refinement aligns with open science principles (Umbach, 2024) and ensures greater semantic consistency in the dataset.

The bibliometric workflow involved three primary tools. OpenRefine was used in the preprocessing stage to clean and standardize keywords and remove duplicates. Biblioshiny, an RStudio extension for bibliometric analysis, provided statistical outputs such as publication trends, citation metrics, and author impact indices (h-index, g-index, m-index). Bibliomagika was then used to visualize keyword co-occurrence maps, thematic evolution, and source impact. This multi-tool approach ensured both analytical depth and visual clarity in presenting the findings.

All stages of the research were conducted in line with international bibliometric standards (Zupic & Cater, 2015), ensuring transparency, consistency, and reproducibility. Since the study relied entirely on publicly available secondary data and did not involve human participants, ethical approval was not required. All tools and references were cited appropriately, and the study complied with academic integrity guidelines.

## **Findings and Discussions**

This section presents the results of a bibliometric analysis of Game-Based Learning (GBL) literature published between 2015 and early 2025. The analysis begins with an overview of the global publication trends to capture the evolution and growth of GBL as a research field. Subsequent subsections explore the thematic structures, keyword distributions, and emerging research trajectories within this domain. Special attention is given to identifying the extent to which Halal education and Islamic-related themes are represented in the existing literature. The discussion integrates both quantitative and thematic insights to assess the visibility of Halal-focused GBL research and to identify strategic gaps for future scholarly development.

### ***Evolution of Game-Based Learning (GBL) Publications***

The evolution of Game-Based Learning (GBL) as a scholarly field can be traced back to 1952, with the first Scopus-indexed article titled "La surdi-mutité chez l'enfant d'âge pré-scolaire; les jeux éducatifs/ Deaf-mutism in the child of pre-school age; educational games" published in Gazette médicale de France. Authored by Guillemaut (1952). This early work discussed the use of educational games in supporting language development among pre-school children with deaf-mutism. This article represents one of the earliest academic recognitions of game elements in educational intervention.

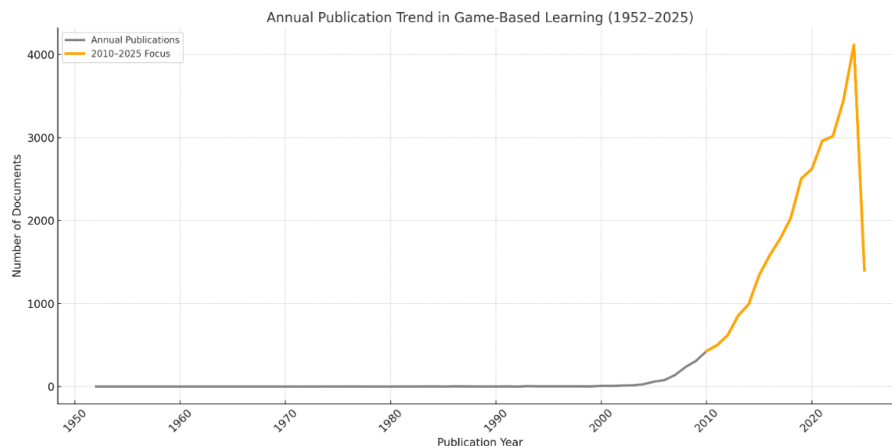


Figure 2: Trend of Overall Publications in Game-based Learning  
Source: Generated by the author(s)

Over the next several decades, research remained sporadic. From 1952 to 1989, only 21 documents were published, mostly exploring play-based and therapeutic learning methods. The 1990s saw a modest rise with 35 publications, coinciding with the early adoption of personal computing and multimedia in classrooms. Between 2010 and early 2025, Game-Based Learning experienced exponential growth, moving from a peripheral innovation to a central educational strategy, as shown in Figure 2. The annual publication count rose from 429 in 2010 to a peak of 4,119 in 2024, with over 30,210 documents published during these 15 years, comprising 97% of all Scopus-indexed GBL literature (totaling 31,173 records from 1952–2025). This surge aligns with the global expansion of digital pedagogy, the mainstreaming of gamification, and increased institutional investment in EdTech solutions across various education sectors.

The bibliometric landscape of Game-Based Learning (GBL) reveals a dramatic expansion in scholarly output, particularly from 2010 to early 2025, reflecting the global mainstreaming of gamification in education. However, this rapid growth does not necessarily imply equal thematic representation across all educational domains. Given the breadth and volume of the dataset, the subsequent analysis intentionally narrows the scope by filtering publications to Open Access, English language, and the 2015–early 2025 period. This strategic limitation was adopted to extract a more focused insight, specifically to explore the presence or absence of Halal education elements within the expanding field of GBL.

#### ***Annual Publication Trend (2015-2025)***

The analysis of annual publication trends from 2015 to early 2025 reveals a marked and sustained increase in Game-Based Learning (GBL) research. A total of 8,218 documents were identified within the refined scope, limited to Open Access, English-language publications indexed in Scopus, indicating the growing academic traction of GBL within educational and technological scholarship. As illustrated in Figure 3, annual publication output increased steadily, peaking at 1,544 documents in 2024. The drop observed in early 2025 (328 documents) is consistent with known lags in Scopus indexing for more recent publications.

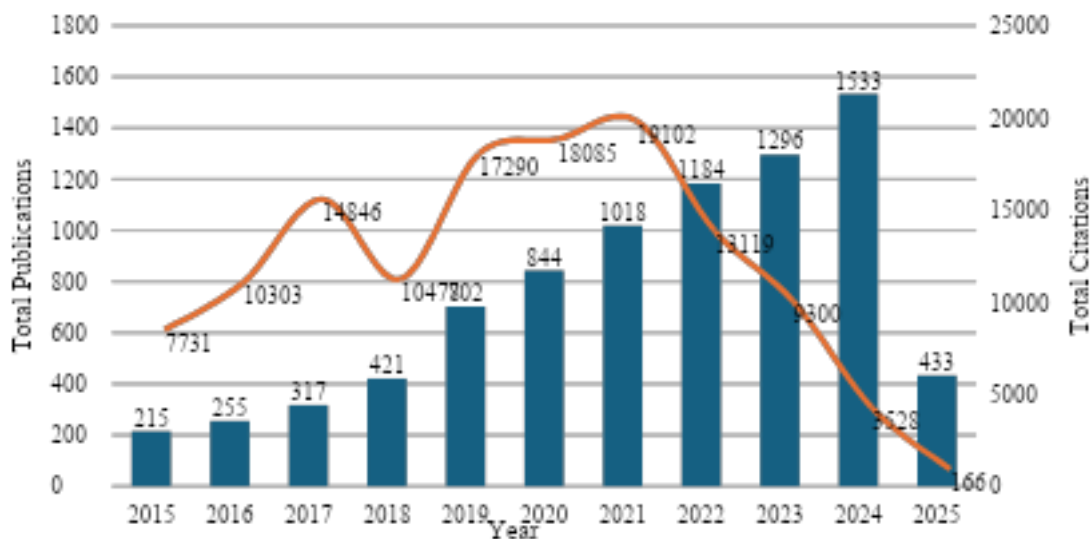


Figure 3: Total publications and total citations by year  
Source: Generated by the author(s) using biblioMagika® (Ahmi, 2024)

Citation metrics (Table 2) further reinforce the prominence of GBL as a research domain. The dataset accrued 123,948 total citations, averaging 15.08 citations per paper and 18.47 per cited paper. With a citation rate exceeding 12,000 per year, the field demonstrates sustained scholarly influence. Supporting indicators such as the h-index (121), g-index (195), and m-index (11.0) confirm the maturity and stability of GBL-related outputs during the study period. These metrics are comparable to other high-growth domains in digital education, including MOOCs and AI-enhanced learning, reflecting GBL's central position in the educational technology discourse.

The upward trend in Game-Based Learning (GBL) research from 2015 to early 2025 confirms its establishment as a prominent area of educational innovation, supported by both strong publication output and high citation impact. This reflects a broader shift in how educators and institutions embrace interactive and technology-driven pedagogies across various disciplines. While this growth signals expanding opportunities for the application of GBL in multiple knowledge domains, it also raises critical questions about the inclusivity and thematic distribution within the field. Given the global importance of Halal literacy and Islamic education, it remains necessary to examine whether such themes have been meaningfully represented in the current GBL literature. Accordingly, the following sections will explore the presence or absence of Halal-related educational content within this expanding body of research to identify potential gaps and inform future development efforts.

Table 2: Publication Metrics of Game-based Learning

| Main Information           | Data              |
|----------------------------|-------------------|
| Publication Years          | 2015 – early 2025 |
| Total Publications         | 8218              |
| Citable Year               | 11                |
| Number of Cited Papers     | 6709              |
| Total Citations            | 123,948           |
| Citation per Paper         | 15.08             |
| Citation per Cited Paper   | 18.47             |
| Citation per Year          | 12394.80          |
| Author per Paper           | 4.13              |
| Citation sum within h-Core | 56,884            |
| h-index                    | 121               |
| g-index                    | 195               |
| m-index                    | 11.000            |

Source: Generated by the author(s) using biblioMagika® (Ahmi, 2024)

### ***Keyword Analysis and Thematic Linkages to Halal Education***

Keyword analysis was conducted to identify dominant themes within Game-Based Learning (GBL) literature indexed in Scopus from 2015 to early 2025. Two visualizations support this section: a frequency ranking of author keywords (Figure 4) and a treemap of high-frequency indexed terms (Figure 5). Together, they offer insight into how the field has evolved and which conceptual areas have attracted sustained scholarly attention.

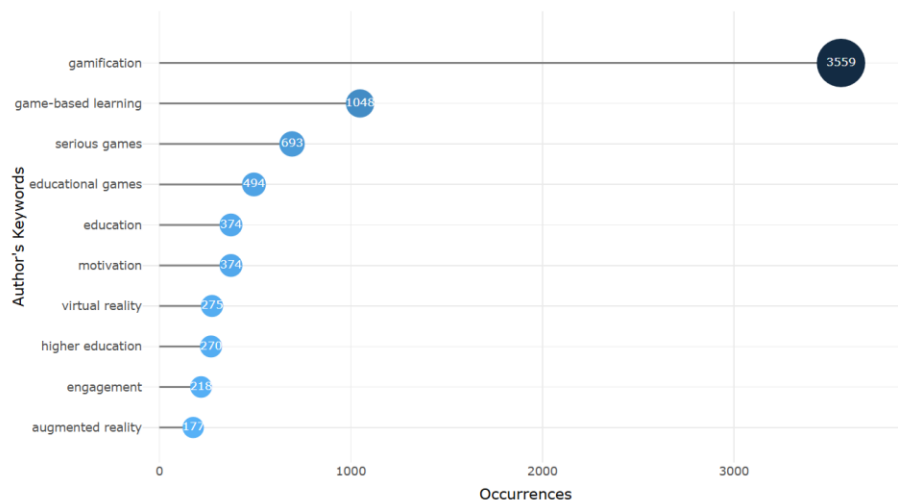


Figure 4: Author's Keyword for Game-based Learning

Source: Generated by the author(s)

As shown in Figure 4, the most frequently used author keywords are “gamification” (3,559 occurrences), “game-based learning” (1,048), “serious games” (693), and “educational games” (494). These keywords confirm the field’s core orientation toward interactive digital pedagogy. Terms such as “motivation”, “engagement”, “virtual reality”, and “higher education” indicate a strong emphasis on immersive learning environments and student-centered outcomes. Complementing this, Figure 4 presents a keyword treemap that further illustrates the breadth of GBL applications. Notable high-frequency terms include “human” (1,299), “students” (906),

“learning” (676), “education” (481), “procedures” (308), and “teaching” (498), suggesting that much of the literature focuses on general educational design, learner behavior, and technology-driven delivery systems. Frequent mentions of “controlled study”, “e-learning”, “questionnaire”, and “curriculum” highlight a parallel concern with evaluation and instructional structures. Despite the diversity of keywords, terms specifically related to Halal education, Islamic pedagogy, or Shariah compliance are absent from both datasets’ top trends. There is no evidence of recurring use of keywords such as “Halal”, “Islamic education”, “fatwa”, “Shariah law”, or “MS1500”. This indicates that Halal-related themes have not yet entered mainstream GBL discourse.

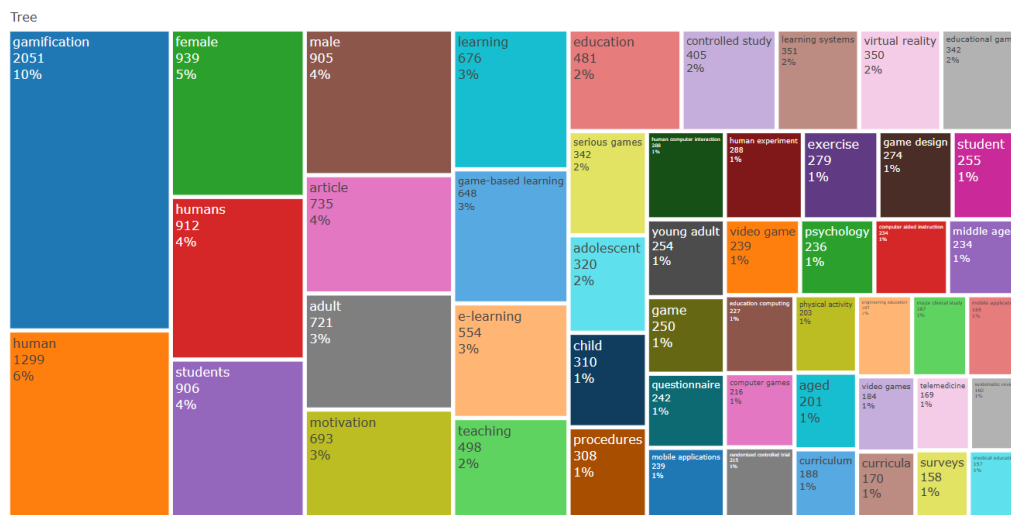


Figure 5: Tree map of Game-based Learning  
Source: Generated by the author(s)

However, a deeper examination of the dataset reveals several isolated studies that apply GBL to Halal awareness and Islamic instruction. These include (Mat et al., 2020, 2023) on Halal gamification in Japan, and Islamic-themed applications such as Sirah learning (Hafiz Yusoff et al., 2020), Quranic memorization (Hassan et al., 2023), and Quranic revision (Ahmad et al., 2024). These efforts demonstrate that while Halal and Islamic GBL applications exist, they are not yet sufficiently consolidated to influence keyword clustering or trend visualization. Nevertheless, the current keyword landscape reveals clear conceptual overlaps between existing GBL themes and the needs of Halal education. Keywords such as “procedures”, “teaching”, “motivation”, and “curriculum” provide entry points for developing GBL tools that address Halal compliance training, ethical literacy, and faith-based education. The prominence of learner-related terms (“students,” “engagement,” “adult learning”) also aligns with Halal literacy objectives in institutional, community, and workplace settings. While Halal education is not yet a dominant research focus in the GBL literature, the field contains the pedagogical foundations and technological frameworks necessary to support its integration.

### ***Trend Topic Reflection and Thematic Positioning of Halal Education in GBL***

The trend topic timeline in Figure 6 illustrates the longitudinal development of key thematic terms within Game-Based Learning (GBL) literature from 2015 to early 2025. This visualization highlights both the duration and intensity of specific research themes over time, providing insight into the field’s evolving priorities.



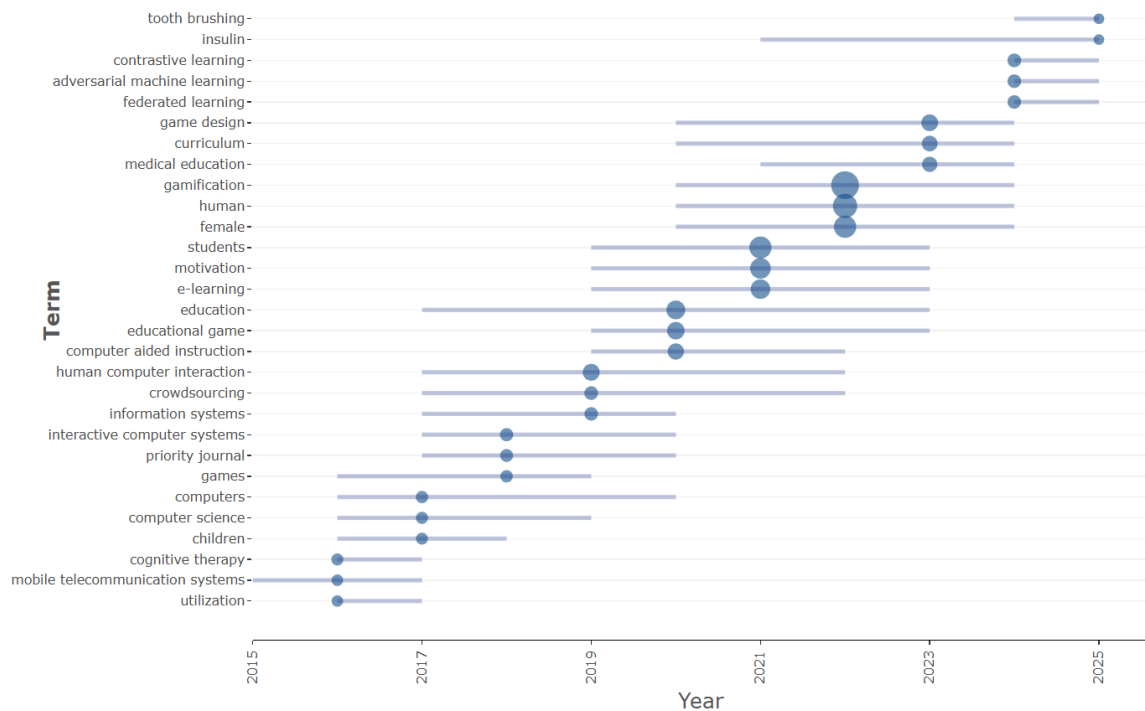


Figure 6: The trend topic timeline of Game-based Learning

Source: Generated by the author(s)

Consistent with keyword analyses presented earlier, foundational terms such as “gamification,” “curriculum,” “game design,” “education,” “students,” and “motivation” have maintained a sustained presence across multiple years. These represent the pedagogical and design pillars of the GBL domain. Their recurrence indicates the growing integration of GBL into formal educational contexts, including curriculum innovation, learner engagement strategies, and teaching practices. At the same time, recent entries such as “federated learning,” “contrastive learning,” and “adversarial machine learning” reflect emerging intersections between GBL and artificial intelligence (AI). While these topics are primarily technical, they indicate an increasingly sophisticated digital learning ecosystem, one that could, in principle, support intelligent and ethical gamified platforms for religious or value-based education.

Despite this breadth, no terms explicitly referencing Halal education, Islamic values, or religious compliance appear as trend topics. This aligns with earlier findings that, although some Islamic-themed GBL studies exist, their influence has not been strong enough to shape broader thematic patterns or drive trend visibility. This suggests that Halal GBL research remains isolated and underdeveloped at the structural level. Nonetheless, many of the dominant trend topics exhibit conceptual compatibility with Halal education goals. Themes such as “curriculum,” “procedures,” “medical education,” “students,” and “motivation” can serve as strategic gateways for developing Halal literacy modules, compliance training tools, and Islamic ethics-based learning experiences. These terms also support interdisciplinary expansion, particularly in areas such as Halal pharmaceuticals, food safety, Islamic health practices, and faith-based behavior change. The gap is not defined by the inapplicability of GBL to Halal education, but rather by a lack of targeted research, conceptual consolidation, and cross-sectoral collaboration. The integration of Halal content into GBL platforms remains an open and necessary direction, particularly in light of the field’s pedagogical flexibility and technological adaptability. A summary of these potential alignments between GBL trend topics and relevant Halal education applications is presented in Table 3.

Table 3: Mapping GBL Trend Topics to Potential Halal GBL Applications

| GBL Trend Topic     | Potential Application in Halal Education   |
|---------------------|--|
| Curriculum          | Development of Halal-integrated school curricula (e.g., Halal food, ethics)      |
| Game Design         | Creation of simulation games for Halal audits, logistics, or certification       |
| Medical Education   | GBL for Halal pharmaceuticals, Islamic health and wellness training              |
| Motivation          | Enhancing youth engagement in Islamic principles through gamified methods        |
| Students            | Gamified tools for school-based Halal education or faith literacy                |
| Procedures          | Simulation of slaughtering protocols, Halal SOPs, and MS1500 compliance          |
| Interactive Systems | Adaptive platforms for personalized Halal learning experiences                   |
| Cognitive Therapy   | Gamified approaches to Islamic behavioral therapy and spiritual resilience       |
| Utilization         | Assessing the adoption of Halal GBL tools among educators or industrial trainees |

Source: Generated by the author(s)

***Synthesis of Gaps and Strategic Recommendations***

The preceding analyses reveal a clear thematic imbalance within the Game-Based Learning (GBL) literature. Despite significant growth and diversification of GBL applications across various domains, no discernible trend trajectory or dominant keyword cluster reflects the presence of Halal education, Islamic pedagogy, or religious compliance frameworks. Keywords such as “Halal,” “shariah,” “fatwa,” or “Islamic education” remain absent from both high-frequency author terms and emerging thematic maps. This absence indicates not only a lack of volume but also a lack of strategic consolidation in aligning GBL with Halal learning objectives. However, the thematic potential for integration remains promising. As demonstrated in the trend topic analysis, concepts such as “curriculum,” “procedures,” “medical education,” “students,” “motivation,” and “interactive computer systems” show sustained relevance and conceptual alignment with Halal education objectives. These overlaps suggest that GBL offers a structurally suitable and technologically ready environment for embedding Halal content, particularly in contexts requiring value-driven compliance, behavioral literacy, and community engagement. Importantly, the gap lies not in the feasibility of applying GBL to Halal content but in the lack of focused research, interdisciplinary collaboration, and instructional design that bridges religious, ethical, and technical expertise. Halal education remains an underdeveloped subdomain within the broader GBL ecosystem. These strategic directions are summarized in Table 4 to guide future research and development pathways in Halal-focused GBL.

Table 4: Strategic Directions for Advancing Halal Education in Game-Based Learning

| Recommendation                                    | Description   |
|---|---|
| i. Co-design of Halal Compliance Modules          | Develop gamified training tools to simulate Halal auditing, MS1500:2019 certification processes, slaughtering protocols, and food chain documentation.      |
| ii. Curriculum Integration Using Maqasid Shariah  | Align Halal literacy with formal curriculum objectives by embedding Islamic legal and ethical values into GBL design for schools, vocational, and industry. |
| iii. Gamification of Faith-Based Storytelling     | Create culturally relevant games for Sirah, Quranic ethics, and Tahfiz education to enhance engagement in Islamic learning environments.                    |
| iv. Digital Therapeutic Games with Islamic Values | Apply GBL to behavior change, mental health, and identity formation through games rooted in Islamic morality and spiritual well-being frameworks.           |
| v. Establish a Halal GBL Research Agenda          | Promote academic consolidation by standardizing terminology (e.g., “Halal gamification”) and encouraging visibility in high-impact research platforms.      |

Source: Generated by the author(s)

These recommendations aim to reposition Halal education not as a peripheral concern but as a viable and necessary expansion within the evolving landscape of ethical, culturally responsive educational technology. Addressing this thematic gap will require not only innovation but also collaborative partnerships among Islamic scholars, Halal regulators, instructional designers, and GBL developers. Immediate next steps could include pilot projects that test Shariah-compliant game prototypes in classrooms, funding initiatives to support value-driven edtech startups, and active engagement with policymakers to embed Halal principles into national digital education agendas.

#### ***Visibility of Halal Education in GBL Publication Outlets***

Figure 7 presents the top publication sources contributing to Game-Based Learning (GBL) literature from 2015 to early 2025. The highest number of documents was published in Sustainability (Switzerland) (212 articles), followed by the Proceedings of the European Conference on Games-Based Learning (188), Education Sciences (163), and the ACM International Conference Proceeding Series (143). Other prominent sources include JMIR Serious Games, Frontiers in Psychology, IEEE Access, and Procedia Computer Science.

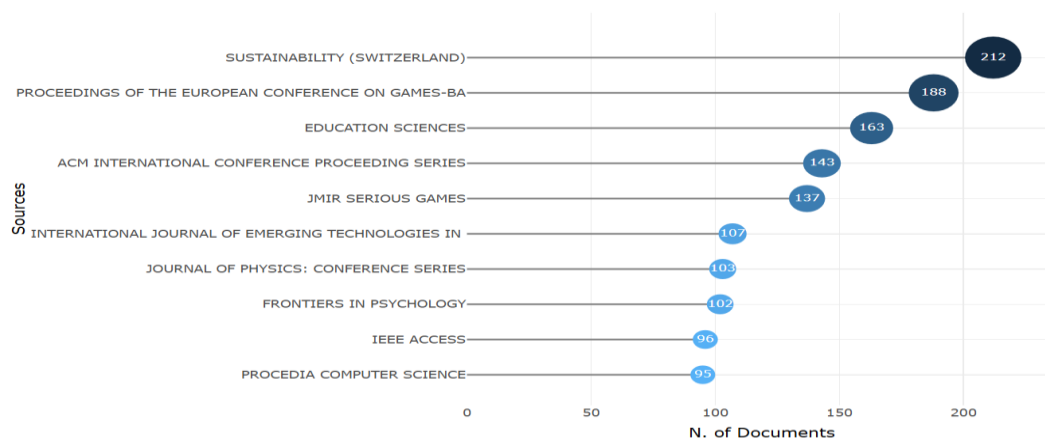


Figure 7: Most Relevant Sources  
Source: Generated by the author(s)

This distribution reflects the interdisciplinary scope of GBL research, encompassing educational technology, psychology, engineering, and healthcare. The high publication volume across both peer-reviewed journals and international conferences underscores the field's academic maturity and global relevance. However, a critical observation emerges when aligning these sources with the thematic focus of this study: none of the top ten sources listed in Figure 6 featured recurring keywords or article titles related to Halal education or Islamic gamification frameworks. This conclusion is based on the previous sections' comprehensive keyword and trend topic reflection analysis. While a handful of Islamic-themed or Halal-related GBL studies were identified in the full dataset, none of them were published in these leading venues.

This finding reinforces the earlier conclusion that Halal education remains thematically underrepresented in mainstream GBL research outlets, despite the increasing demand for faith-based educational technology and compliance training tools. It also suggests that existing efforts remain isolated and have yet to gain traction in high-visibility, interdisciplinary academic platforms. To advance Halal GBL as a recognized subdomain, future research should not only focus on content development but also strategic dissemination. This includes targeting high-impact journals through special issues, submitting to educational technology conferences with a cultural or ethical dimension, and building interdisciplinary networks that connect Islamic scholars with EdTech developers and curriculum designers.

## Conclusion

This study carries several implications that extend beyond its bibliometric findings. At the conceptual level, the absence of Halal education within Game-Based Learning (GBL) research shows the need to broaden how educational innovation is understood. Pedagogical models should not only emphasize engagement and efficiency but also reflect cultural and ethical values that are central to learners' identities.

In practical terms, the findings point to opportunities for educators and developers to design interactive tools that bring Halal principles to life. Compliance simulations, digital storytelling rooted in Islamic tradition, and game-based activities that encourage ethical decision-making could make Halal education more accessible and meaningful, particularly for younger learners who are already immersed in digital environments.

At the policy and institutional level, the results highlight the importance of stronger collaboration between Islamic scholars, curriculum experts, and educational technologists. Investment in research partnerships, clear curricular guidelines, and targeted funding will be vital to ensure Halal education is not left behind in the global shift toward technology-driven learning.

This study also offers the first bibliometric review to map the presence of Halal education in GBL research from 2015 to early 2025. Despite the rapid growth of GBL as a pedagogical field, Halal education remains largely invisible in both thematic focus and publication outlets. The findings point to a structural gap, shaped by disciplinary boundaries that have so far kept faith-based content at the margins of digital pedagogy. Yet, the infrastructure of GBL provides a strong foundation for change. By embedding Islamic values into game-based formats and encouraging cross-disciplinary collaboration, educators and researchers can begin to close this gap. In doing so, they can help build learning systems that are not only technologically advanced but also culturally responsive and ethically grounded.

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### References

- Abd. Aziz, N. A., Wan Ibrahim, W. K., Mohamed Jamil, M. Z., Asmuje, N. F., Spawi, M., Nicholas Hsiu, A. R., & Albert Hsiu, A. R. (2024). Halal Vocation Game: The New Edutainment For A Career Pathway In Halal Field. *Journal of Fatwa Management and Research*, 29(2), 1–22. <https://doi.org/10.33102/jfatwa.vol29no2.581>.
- Abdurrahman, U., Ardiani, Y. E., & Sa'adah, Y. (2025). Fiqh al-Awlawiyat is the basis for education on Halal food and beverage. *Journal of Halal Science and Research*, 6(1), 27–37. <https://doi.org/10.12928/jhsr.v6i1.10424>.
- Ahmad, A. M., Rahman, A. A., Saleh, M. H., & Daud, Z. (2024). Diversifying Quranic revision methods using gamification-based teaching material for tahfiz education. *International Journal of Evaluation and Research in Education*, 13(2). <https://doi.org/10.11591/ijere.v13i2.26218>.
- Ahmi, A. (2024). *Bibliometric Analysis using biblioMagika® Second Edition*. Academic Research Society of Malaysia.
- Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Dikmen, M., & Bahadır, F. (2022). Bibliometric Mapping of Gamification in Education. *Eğitim Yansımaları*, 6.
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285–296. <https://doi.org/10.1016/j.jbusres.2021.04.070>
- Ekin, C. C., & Gul, A. (2022). Bibliometric Analysis of Game-Based Researches in Educational Research. *International Journal of Technology in Education*, 5(3), 499–517. <https://doi.org/10.46328/ijte.341>.



- Guillemaut, J. (1952). La surdi-mutité chez l'enfant d'âge pré-scolaire; les jeux éducatifs. *Gazette Médicale de France*, 59(22).
- Hafiz Yusoff, M., Alomar, M. A., & Syafiqah Mat, N. A. (2020). The development of "Sirah Prophet Muhammad (SAW)" game-based learning to improve student motivation. *International Journal of Engineering Trends and Technology*, 1. <https://doi.org/10.14445/22315381/CAT11P224>.
- Hassan, S. H. C., Shamsuddin, S. N. W., & Yusof, N. H. (2023). Towards Designing a Framework for Adaptive Gamification Learning Analytics in Quranic Memorisation. *Pertanika Journal of Science and Technology*, 31(1). <https://doi.org/10.47836/pjst.31.1.16>.
- Karagöz, B., & Ateş, H. (2022). Trends in digital game-based learning research: Bibliometric analysis (2001-2021). *Revista on Line de Política e Gestão Educacional*, Araraquara, v. 26(n. 00, e022168), 1–19. <https://doi.org/https://doi.org/10.22633/rpge.v26i00.17726>.
- Kartika, B. (2018). The importance of Halal education in forming the civilized and exemplary global citizen. In *Character Education for 21st Century Global Citizens* (pp. 59–67). <https://doi.org/10.1201/9781315104188-8>.
- Kulsum, F., & Rohman, C. (2025). Halal Halal Literacy Profile of Class VIII Students Through Science Learning on The Subject of The Human Digestive System at SMP Edu Global School Bandung. *Jurnal Kajian Peradaban Islam*, 8(1), 51–55. <https://doi.org/10.47076/jkps.v8i1.307>.
- Magpusao, J. R. (2024). Gamification and game-based learning in primary education: A bibliometric analysis. *Computers and Children*, 3(1), em005. <https://doi.org/10.29333/cac/14182>.
- Maliya, L., Malahayatie, & Muslina. (2024). Halal Education and Promotion. *Dalwa Islamic Economic Studies*, 3(2), 99–113. <https://doi.org/10.38073/dies.v3i2.1587>.
- Mat, R. C., Kazunori, M., & Rahman, A. A. (2020). The Development of Mobile Japanese Halal Gamification (MJHG). *International Journal of Interactive Mobile Technologies*, 14(17). <https://doi.org/10.3991/ijim.v14i17.16653>.
- Mat, R. C., Kazunori, M., & Rahman, A. A. (2023). An Exploratory Study of Halal Awareness Among Japanese People for Identifying Gamification Contents. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, 30(3). <https://doi.org/10.37934/araset.30.3.4556>.
- Nguyen, K. T. B., Tran, T. B., Thai, C. M., Duong, V. C., & Nguyen, T. K. (2024). Promoting Consumers' Adoption of Buy-Now-Pay-Later Feature While Using E-wallet Application: The Case of Gen Z in Vietnam. *Proceedings of the European Conference on Innovation and Entrepreneurship, ECIE*, 19(1), 555–564. <https://doi.org/10.34190/ecie.19.1.2593>.
- Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of Game-Based Learning. *Educational Psychologist*, 50(4). <https://doi.org/10.1080/00461520.2015.1122533>.
- Pratama, F. A., Wahyudi, M., Eka Putra, D., Muslim, M., & Effendi, H. (2023). Analysis of the Role of Vocational Education for the Halal Tourism Development in Indonesia. *Edumaspul: Jurnal Pendidikan*, 7(2), 6053–6068. <https://doi.org/10.33487/edumaspul.v7i2.7585>.
- Rosyad, A. M. (2019). The Urgency of Learning Innovation on Islamic Religious Study. *Al-Afkar, Journal For Islamic Studies*, 2(1).
- Salman, A. M., Halim, A., Rohman, N., & Susilayati, M. (2019). "Halal" As a Competitive Distinction for Islamic Higher Education in Preparing Muslim Millenials. *Indonesian Journal of Islamic Literature and Muslim Society*, 3(2), 111–122. <https://doi.org/10.22515/islimus.v3i2.1922>.

- Umbach, G. (2024). Open science and the impact of Open Access, Open Data, and FAIR publishing principles on data-driven academic research: Towards ever more transparent, accessible, and reproducible academic output? *Statistical Journal of the IAOS*, 40(1), 59–70. <https://doi.org/10.3233/SJI-240021>
- U. Palanisamy, T. Khan, S. A. J. (2017). Educational Needs and Awareness of Pharmacy and medical student toward Halal pharmaceutical. *Monash Medicine Curriculum Conference 2017*. <https://pureportal.strath.ac.uk/en/publications/educational-needs-and-awareness-of-pharmacy-and-medical-students-%0Ahttps://strathprints.strath.ac.uk/63478/%0A>.
- Zupic, I., & Cater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods*, 18(3), 429–472. <https://doi.org/10.1177/1094428114562629>