

A Systematic Literature Review of the Development of Technology-Based History Learning (2022–2026)

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Abstrak

This study aims to analyze the development of research on technology-based history learning through a Systematic Literature Review (SLR) approach. The study was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines by reviewing 93 articles indexed in the Scopus database published between 2022 and 2026. The data were analyzed using VOSviewer software to map research trends, country distribution, institutional affiliations, journals, authors, and keyword occurrences in the field of

history learning. The findings indicate that publications on technology-based history learning have increased significantly, reaching their peak in 2025, with Indonesia emerging as the leading contributor. The most frequently occurring keywords include history learning, history education, historical thinking, and e-learning. Furthermore, the study reveals that the integration of technology into history learning has a positive impact on enhancing student engagement, critical thinking skills, and instructional innovation. These findings are expected to serve as a valuable reference for future research and the development of technology-based history learning practices. In conclusion, technology-based history learning has demonstrated increasingly strong development as a relevant field of study in contemporary education. The integration of technology not only enriches history teaching strategies but also has the potential to improve learning quality by strengthening students' engagement in historical thinking and fostering pedagogical innovation. Therefore, further research is needed to expand investigations into diverse contexts, methodologies, and technological applications in history learning.

Key Word

History Learning; History Education; Systematic Literature Review; Historical Thinking

I. Introduction

The development of a Systematic Literature Review (SLR) on the advancement of technology-based history learning in the contemporary era is essential because it enables researchers to comprehensively synthesize empirical findings regarding the effectiveness of integrating digital technologies into history education. The rapid advancement of educational technologies, such as Artificial Intelligence (AI), Augmented Reality (AR), Virtual Reality (VR), gamification, and digital learning platforms, has significantly transformed pedagogical practices in history education. However, the effectiveness and implementation of

these technologies vary across different educational contexts. Through the SLR approach, researchers can systematically identify research trends, evaluate the effectiveness of technology-assisted learning methods, and uncover gaps in the existing literature (Korniienko, 2025; Lai & Bower, 2020).

Furthermore, an SLR is crucial for supporting educational policy development and instructional innovation by providing evidence-based recommendations for teachers, educational institutions, and policymakers to enhance students' engagement, motivation, and learning outcomes. Previous studies have demonstrated that interactive technologies, such as game-based learning and augmented reality, can improve students' historical understanding, critical thinking skills, and learning experiences by creating immersive and participatory learning environments (Bjørner, 2024; Tripoulas & Koutromanos, 2024).

Nevertheless, several challenges remain, including teachers' limited digital literacy, unequal access to technological resources, and the scarcity of longitudinal studies investigating the long-term effects of technology integration in history education (Issayev & Apendiyev, 2025). Therefore, conducting an SLR is highly relevant for providing a comprehensive overview of the development of technology-based history learning in the contemporary era. This review not only synthesizes previous research findings but also evaluates the extent to which digital technologies have been effectively utilized in history education.

Based on previous studies, it is evident that the integration of technology into history learning has positively contributed to improving students' engagement, motivation, conceptual understanding, and critical thinking skills. However, the existing literature on technology-based history learning still exhibits several limitations. Most previous studies have focused on the application

of specific technologies—such as Artificial Intelligence, augmented reality, virtual reality, gamification, or e-learning platforms—in isolation. Consequently, the overall direction of research on technology-based history learning remains fragmented and has not yet been comprehensively mapped.

Moreover, previous research has predominantly emphasized the short-term effects of technology on students' motivation, learning interest, and academic achievement. In contrast, studies examining the relationship between technology integration and the core characteristics of history learning—such as historical thinking, historical source analysis, chronological understanding, historical interpretation, and historical consciousness—remain relatively limited. Other limitations include the lack of longitudinal research investigating the long-term impact of digital technology integration in history education, as well as insufficient attention to factors such as teachers' readiness, digital literacy, school infrastructure, and disparities in access to technology.

Accordingly, there is a significant research gap that should be addressed through a Systematic Literature Review capable of systematically synthesizing and mapping the development of research on technology-based history learning. The novelty of this study lies in the application of the Systematic Literature Review approach following the PRISMA guidelines, complemented by bibliometric analysis using VOSviewer to map publication trends, country distribution, institutional affiliations, journals, authors, and keyword occurrences within the field of technology-based history learning. Through this approach, the study not only synthesizes previous research findings but also identifies research trends, emerging patterns, and future research opportunities for the advancement of technology-based history learning in the contemporary era.

II. Method

This study employed a Systematic Literature Review (SLR) method based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. This approach was selected to ensure that every stage of the research process, from literature searching and screening to data analysis, was conducted systematically, transparently, and with scientific rigor. Through this method, the study aimed to identify, evaluate, and synthesize previous research findings relevant to the research focus in a comprehensive manner.

The initial stage of the study involved formulating clear, specific, and focused research questions. These questions served as the primary foundation for defining the scope of the review and guiding the literature search process to ensure alignment with the research objectives. By establishing well-structured research questions, the literature search could be conducted more efficiently, systematically, and with minimal inclusion of irrelevant studies.

Subsequently, the literature search was conducted systematically using the Scopus database as the primary source of scientific publications. The search strategy employed keywords developed from the research variables and combined them using Boolean operators, including AND, OR, and NOT, to obtain more accurate, targeted, and relevant search results.

To ensure the quality of the selected literature, this study established rigorous inclusion and exclusion criteria. The inclusion criteria comprised scholarly articles that were substantially relevant to the research topic, published within a specified time frame, available in full-text format, and published in reputable and indexed journals. Furthermore, the selected articles were required to present a clearly defined research methodology, a systematic

writing structure, and empirical findings that could be further analyzed. Conversely, the exclusion criteria were applied to eliminate studies that failed to meet these standards, including articles that were irrelevant, duplicated, unavailable in full text, or lacked methodological clarity.

The literature selection process followed the PRISMA framework, consisting of four stages: identification, screening, eligibility assessment, and final inclusion. During the identification stage, all records retrieved from the database were collected comprehensively. The screening stage involved removing duplicate records and evaluating studies based on their titles and abstracts. The eligibility stage consisted of a full-text assessment to determine whether each article satisfied the predefined inclusion criteria. Finally, the studies deemed eligible were included as the primary sources for data analysis.

The selected articles were then analyzed through a systematic data extraction process. At this stage, essential information was collected from each study, including the authors, year of publication, research objectives, research methods, and principal findings. The extracted data were subsequently analyzed using a qualitative descriptive approach through processes of categorization, comparison, and interpretation to generate a comprehensive synthesis of the existing literature.

The results of the analysis were then organized into a systematic and well-structured scientific report. The findings were presented narratively and supported by tables and figures, including the PRISMA flow diagram illustrating the detailed stages of the literature selection process. Consequently, the research findings are presented in a manner that is not only easy to understand but also demonstrates a high level of transparency, validity, and scientific accountability.

The study also began by determining relevant keywords using a macro (top-down) approach, in which the literature search started

with broad search terms and was progressively refined toward a more specific research focus. The keyword "History Learning" was selected as the primary search term for the literature review. This keyword was applied to the titles, abstracts, and author keywords of the articles to ensure the relevance of the search results. In this process, the Scopus database served as the primary source for obtaining credible and relevant publications, while also enabling the identification of leading scholars who have made significant contributions to the field and mapping research trends related to the topic.

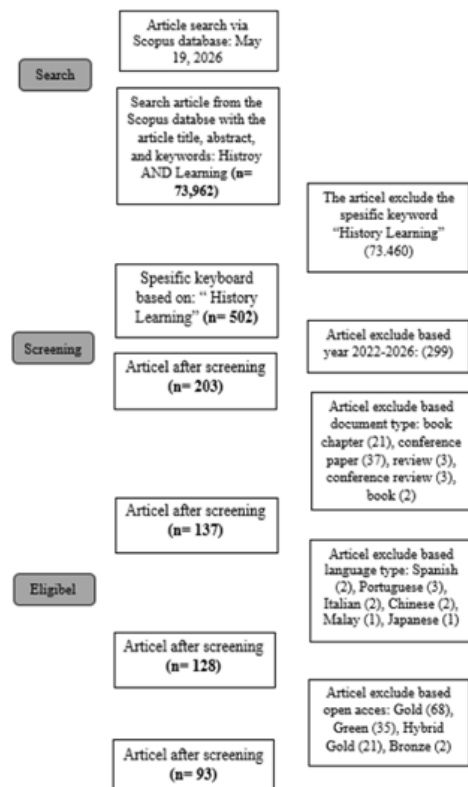


Figure 1. PRISMA Flow Diagram of the Study

The figure above indicates that the majority of existing studies have primarily focused on improving students' motivation, engagement, and learning outcomes. Research that specifically examines the relationship between technology and historical

thinking skills, historical source analysis, event interpretation, and historical consciousness remains relatively limited. Therefore, future studies should be directed toward the development of technology-based history learning that is not only visually engaging and interactive but also capable of strengthening students' historical competencies.

This article addresses several Research Questions (RQs) based on the 93 selected articles, namely:

RQ1: How has research on history education evolved within the field of education?

RQ2: How is research on the development of technology-based history learning distributed?

RQ3: What are the theoretical and practical implications of current research perspectives for future studies?

III. Result and Discussion

The results and discussion presented in this paper focus on the findings from 93 articles indexed in the Scopus database on history education, including the authors, their affiliations, and the countries involved.

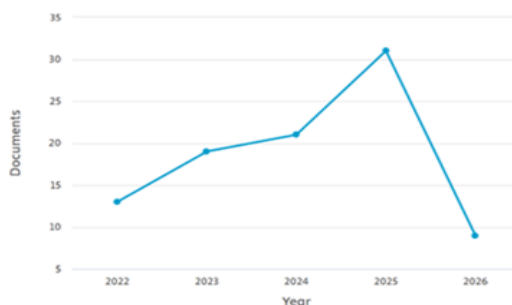


Figure 2. Publication Trend Related to History Learning from 2022 to 2026

Based on Figure 2, the number of indexed documents shows an overall upward trend from 2022 to 2025, followed by a decline in 2026. In 2022, there were 13 indexed documents, increasing to 19 documents in 2023 and further rising to 21 documents in 2024. The most significant increase occurred in 2025, when the number of publications reached 31 documents.

The substantial growth in publications in 2025 can be interpreted as evidence of increasing academic interest in technology-based history learning. This upward trend is likely associated with the expanding integration of digital technologies into educational practices, including Artificial Intelligence (AI), e-learning platforms, gamification, Augmented Reality (AR), Virtual Reality (VR), and various interactive learning platforms. Furthermore, the rapid advancement of educational technology in the post-pandemic era has encouraged researchers to evaluate the effectiveness of digital learning media in enhancing students' engagement, motivation, and critical thinking skills.

However, in 2026, the number of indexed documents declined considerably to only nine publications. This finding indicates that research output on the analyzed topic experienced relatively consistent growth during the first four years before decreasing in the final year. This pattern suggests that scholarly interest in technology-based history learning gradually increased, reached its peak in 2025, and then declined in 2026. It should also be noted that the lower number of publications in 2026 may be influenced by the fact that the year was still in progress when the data were collected, meaning that not all publications had been indexed. Within the context of this Systematic Literature Review (SLR), these findings illustrate the evolution of research activities and publication trends over the analyzed period (Basri et al., 2022; Boty et al., 2023; Fadli et al., 2022, 2023; Muhammad et al., 2022; Nachtigall et al., 2022; Ningsih et al., 2023; Nouri et al., 2022; Park & Cho, 2022; Tirado-Olivares et al., 2024).

RQ2: How is the research distribution on the development of technology-based history learning?

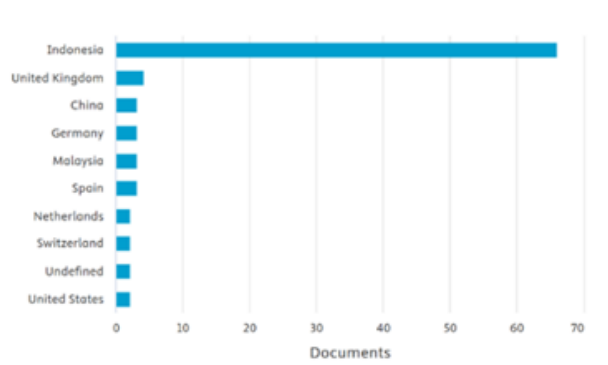


Figure 3. Distribution of Publications on History Learning by Country (2022–2026)

Based on the graph illustrating the distribution of documents by country, Indonesia dominates the number of publications included in this study, with approximately 66 documents. This figure is substantially higher than that of other countries, indicating that the research topic examined in this systematic literature review (SLR) has received considerable attention and significant scholarly contributions from Indonesian researchers. In contrast, countries such as the United Kingdom, China, Germany, Malaysia, and Spain each contributed only around 3–5 documents. Meanwhile, the Netherlands, Switzerland, the United States, and the Undefined category accounted for relatively few publications, with approximately two documents each.

These findings reveal an uneven distribution of publications across countries, with research activities being heavily concentrated in Indonesia. This pattern suggests that the research topic addressed in this SLR has experienced rapid development within the Indonesian context but still offers substantial opportunities for broader investigation and international collaboration. Furthermore, the relatively limited contributions from other

countries may indicate that this research topic has not yet been extensively explored on a global scale.

The researchers also analyzed the relationships among countries involved in History Learning research using VOSviewer software. This stage is essential for formulating a systematic future research agenda. The VOSviewer analysis revealed the existence of collaborative links among countries in investigating the topic of History Learning.

These findings indicate that research on history education has received considerable attention across various international educational contexts. Based on the country network visualization, Indonesia emerges as the most dominant country and demonstrates research connections with several other countries, including Malaysia, Spain, the United Kingdom, and China. Indonesia's dominance is reflected by its larger node size compared to other countries, indicating its substantial contribution to publications related to the theme of the Persatuan Guru Republik Indonesia (PGRI). Furthermore, the intercountry connections suggest that issues related to history education are not only relevant within the national context but have also become an important topic in global educational discourse. This condition highlights that history education is regarded as a crucial component in enhancing teacher professionalism, strengthening the quality of teaching and learning, and promoting the development of more adaptive and collaborative education systems across different countries.

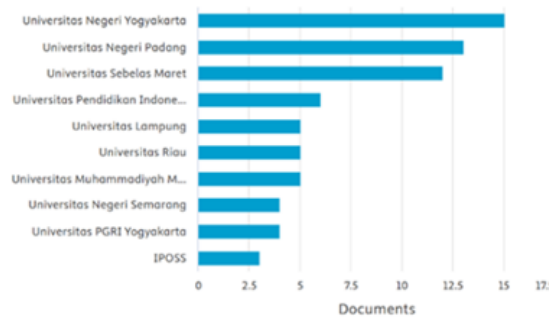


Figure 4 presents the distribution of institutional affiliations based on history education publications from 2022 to 2026.

The document mapping results indicate that research output was dominated by a limited number of institutions. Universitas Negeri Yogyakarta recorded the highest number of publications with 15 documents, followed by Universitas Negeri Padang with 13 documents and Universitas Sebelas Maret with 12 documents. The prominence of these three universities suggests that publication productivity remains concentrated within a small group of higher education institutions.

Meanwhile, Universitas Pendidikan Indonesia contributed 6 documents, while Universitas Lampung, Universitas Riau, and Universitas Muhammadiyah Malang each produced 5 documents. Universitas Negeri Semarang and Universitas PGRI Yogyakarta each recorded 4 documents, whereas IPOSS had the lowest publication output with only 3 documents. Overall, this pattern indicates that publication productivity is unevenly distributed and continues to be concentrated in institutions with stronger research capacity.

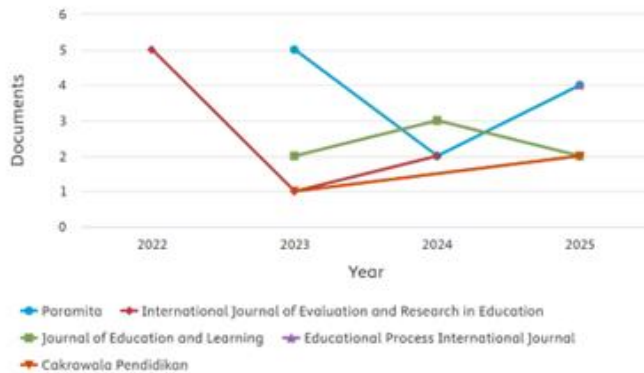


Figure 5. Publication Trends of History Education Journals (2022–2026)

Based on the graph, the number of publications across several journals during the 2022–2025 period exhibited a fluctuating trend. Paramita recorded the highest number of publications in 2023 with five documents, followed by a decline to two documents in 2024 before increasing again to four documents in 2025. Meanwhile, the International Journal of Evaluation and Research in Education experienced a relatively significant decrease, from five documents in 2022 to one document in 2023, followed by a slight increase to two documents in 2024.

Furthermore, the Journal of Education and Learning demonstrated a relatively stable publication trend, increasing from two documents in 2023 to three documents in 2024, before slightly declining to two documents in 2025. The Educational Process: International Journal recorded four publications in 2025, making it one of the journals with the highest publication contributions toward the end of the study period. In addition, Cakrawala Pendidikan showed a gradual increase, from one document in 2023 to two documents in 2025.

Overall, the data indicate that publications related to the research topic experienced dynamic changes from year to year. Among the journals analyzed, Paramita and the International Journal of

Evaluation and Research in Education emerged as the most dominant in terms of the number of published documents compared with the other journals.

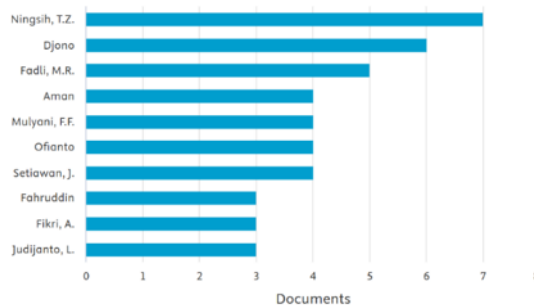


Figure 6. Author Distribution in History Education Journal Publications (2022–2026)

Based on the bar chart, the distribution of publication documents among the most productive authors in the analyzed research topic can be observed. The author with the highest number of publications is Ningsih, T.Z., with a total of 7 documents, making this author the most dominant and productive contributor in the field. The second position is occupied by Djono, who published 6 documents, followed by Fadli, M.R., with 5 documents. Furthermore, three authors Aman, Mulyani, F.F., and Ofianto each contributed 4 documents. In addition, Setiawan, J. also demonstrated a notable contribution with a relatively high number of publications. Meanwhile, Fahrurddin, Fikri, A., and Judijanto, L. each produced 3 documents, indicating active scholarly contributions, although at a lower level than the leading authors.

Overall, these findings indicate that research productivity in this field is still dominated by a small number of scholars, particularly Ningsih, T.Z. and Djono. Their high publication output suggests that they play a significant role in advancing research and disseminating knowledge in history education. At the same time,

the relatively balanced distribution of publications among several other authors reflects ongoing collaboration and the continuous development of research within this field.

RQ3: What are the theoretical and practical implications for future research perspectives?

This study analyzed 93 manuscripts retrieved from the Scopus database on the topic of history education. A bibliometric analysis using VOSviewer revealed both theoretical and practical implications for the future development of history education research. Metadata analysis with VOSviewer enables researchers and practitioners to better understand research trends, collaboration patterns, and the major themes associated with history education. Furthermore, bibliometric analysis helps identify variables or research topics that have been extensively investigated as well as those that remain underexplored, thereby providing a valuable foundation for determining future research directions. From a practical perspective, the literature analysis conducted using VOSviewer also supports the development of more innovative, adaptive, and technology-enhanced history learning practices that are aligned with the evolving needs of contemporary education.

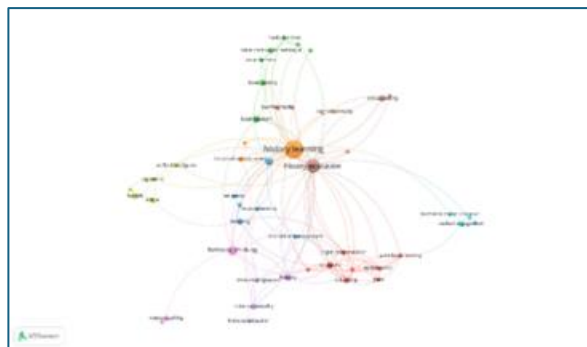


Figure 7. Visualization of the Co-occurrence Network and Representation of Key Terms Showing Major Research Trends in History Education

As illustrated in Figure 7, the most frequently occurring keywords in journal articles on history education are history learning (34 occurrences), history education (19), historical thinking (9), history (4), students (4), e-learning (3), education computing (2), engineering education (2), game (2), and game-based learning (2). These findings indicate that research in history education has primarily focused on learning processes, the development of historical thinking skills, student-centered learning, and the integration of digital technologies and game-based learning approaches.

Tabel 1 Key Word

<i>Rank</i>	Keyword	Link strenght total
1	History Learning	42
2	History Education	30
3	Historical Thinking	16
4	Students	15
5	E-Learning	13
6	History	13
7	Education Computing	12
8	Engineering Education	9
9	Game	8
10	Game-Based Learning	8

Based on the mapping results and a review of previous studies, it is evident that publications on history education are still predominantly concentrated in Indonesia, which has a substantially higher number of documents than any other country (Figure 3). In contrast, countries such as the United Kingdom, China, Germany, Malaysia, Spain, the Netherlands, Switzerland, and the United States have produced relatively few publications in this field. These findings indicate that research on history education remains geographically concentrated and has not yet been evenly distributed across diverse global educational contexts.

Therefore, future research should be expanded to include a broader range of countries in order to provide more diverse and comprehensive perspectives on the development of history education. Such efforts would help reduce cross-national research gaps and contribute to a more comprehensive understanding of the implementation and evolution of history education across different educational systems worldwide.

IV. Conclusion

Based on the results of a Systematic Literature Review (SLR) of 93 Scopus-indexed manuscripts, it can be concluded that research on technology-based history education has experienced significant growth in recent years. The publication trend shows a steady increase from 2022, reaching its peak in 2025, indicating growing academic interest in the integration of technology into history education. Technologies such as Artificial Intelligence (AI), e-learning, game-based learning, and various digital platforms have become essential components of innovation in contemporary history education.

The bibliometric analysis conducted using VOSviewer revealed that Indonesia was the country with the highest number of publications compared to other countries. Furthermore, the country collaboration network visualization demonstrated research partnerships among countries such as Malaysia, the United Kingdom, China, and Spain in advancing history education research. At the institutional level, research productivity was dominated by several universities, including Yogyakarta State University, Padang State University, and Universitas Sebelas Maret. Meanwhile, authors such as Ningsih, T.Z., Djono, and Fadli, M.R. emerged as the leading contributors to the development of research on history education.

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