




Digital Literacy and Civic Education in the Digital Era: A Bibliometric Analysis (2016–2025)

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<p>Article history: Received 09-09-2025 Revised 10-10-2025 Accepted 12-10-2025 Published 16-11-2025</p> <p>How to cite: Anastasya, & Arpanudin, I. (2025). Digital Literacy and Civic Education in the Digital Era: A Bibliometric Analysis (2016–2025). <i>Edcomtech: Jurnal Kajian Teknologi Pendidikan</i>, 10(2), 89–106. https://doi.org/10.17977/um039v10i22025p89-106</p> <p>© The Author(s)  This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License</p>	<p>Penelitian ini memetakan tren literasi digital dalam pendidikan kewarganegaraan pada era digital melalui analisis bibliometrik terhadap 123 artikel Scopus (2016–2025) dengan pendekatan PRISMA. Hasil menunjukkan lonjakan publikasi pasca-COVID-19 dengan kontribusi tertinggi dari Amerika Serikat dan Indonesia. Tema utama penelitian meliputi <i>digital citizenship</i>, <i>civic education</i>, dan <i>media literacy</i>, disertai isu disinformasi, berita palsu, serta etika digital. Temuan ini menegaskan bahwa literasi digital bukan sekadar kemampuan teknis, tetapi kompetensi kewarganegaraan yang bersifat reflektif dan etis. Secara teoretis, penelitian ini memperluas kerangka <i>digital citizenship education</i> dengan menempatkan literasi digital kritis sebagai fondasi pembelajaran kewarganegaraan di era demokrasi digital.</p> <p>Kata Kunci: <i>Bibliometrik; Literasi Digital; Pendidikan Kewarganegaraan</i></p> <p>Abstract <i>This study maps digital literacy trends in civic education in the digital era through a bibliometric analysis of 123 Scopus articles (2016–2025) using the PRISMA approach. The findings reveal a post-COVID-19 surge in publications, with the United States and Indonesia as the top contributors. Core themes include digital citizenship, civic education, and media literacy, along with issues of disinformation, fake news, and digital ethics. The results highlight that digital literacy is not merely a technical skill but a reflective and ethical civic competence. Theoretically, this study extends the framework of digital citizenship education by positioning critical digital literacy as the foundation of civic learning in the context of digital democracy.</i></p>
	<p>Keywords: <i>Bibliometric; Digital Literacy; Civic Education</i></p>

INTRODUCTION

The development of digital technology in the last two decades has drastically changed the way people obtain information, communicate, and participate in public life. Social media, online platforms, and virtual spaces have now become the main arena for political discussion, expression of identity, and a means of social mobilization. The digital era has fundamentally transformed the paradigm of civic education. This transformation has not only changed the way individuals access information, but has also reconstructed the mechanisms of democratic participation from physical spaces to digital spaces (Mahadir et al., 2021).

In this context, digital literacy is an important prerequisite for shaping citizens who are able to participate critically and ethically in digital democracy (Nugrahani et al., 2023). The impact is not limited to the learning and teaching process, but also encompasses the way individuals interact in social and political life. The public sphere has now expanded into the digital realm, enabling political participation, expression of identity, and social interaction to take place online (Fatimah, 2025). These changes require adjustments in the approach to civic education so that it can equip the younger generation with relevant and ethical digital literacy skills to face the challenges of the times. Digital literacy plays a central role in everyday life because it equips students and the community with the knowledge, skills, and behaviors necessary to interact effectively in the digital space (Balcytiene et al., 2025; Castellví et al., 2021; Fajri et al., 2022).

Indonesia faces serious challenges in digital literacy. Data from the Ministry of Communication and Information Technology shows that 4.5 million pieces of negative content have been blocked and taken down, and 928 cases of hoaxes have been recorded between 2018 and 2024 (Komdigi, 2025). This reality highlights the urgency of strengthening digital literacy amid the proliferation of misleading information and the potential for manipulation of public opinion. Digital literacy is crucial in equipping the public with the critical skills to sort through information, understand context, and build healthy trust in the digital space. One of the contemporary issues that has emerged in Indonesia is the 18 + 7 Movement, which is a demand voiced by the people through digital public spaces (Kompas, 2025). This phenomenon reflects a fundamental paradox in the contemporary digital landscape: on the one hand, there is a flood of disinformation, hate speech, and destructive content that threatens the foundations of democratic deliberation; on the other hand, the digital space has become the main arena for the articulation of citizens' will. This paradox underscores the need for digital literacy that is not only functional, but also critical and ethical, so that public participation can take place in a responsible and constructive manner.

The concept of digital literacy has evolved since its initial definition (Gilster, 1997) which emphasizes the ability to evaluate information, understand context, communicate, and build new knowledge. This understanding is increasingly relevant in citizenship education, as the formation of critical and responsible citizens in the digital age requires

comprehensive mastery of digital literacy. This study uses bibliometric analysis to map trends in digital literacy research in civic education during the period 2016 - 2025, including the identification of dominant themes, research trends, and patterns of collaboration between researchers across countries. Academically, these findings can serve as a basis for future researchers to expand or deepen studies in the fields of education and social sciences, while practically, the results of this study have the potential to equip teachers, curriculum designers, and policy makers in formulating learning strategies and national digital literacy programs that are relevant to the characteristics of the digital generation (Lestari & Machmudah, 2023; Simões et al., 2024). Thus, Indonesia's younger generation is expected to develop into critical, responsible digital citizens who uphold ethics in their interactions in the digital space.

Several previous studies that examined digital citizenship education using bibliometric analysis methods, such as (Safutri et al., 2025) which discusses digital-based civic education for the period 2004-2025. The study uses the keywords “digital citizenship, civic engagement, critical thinking, values education”, but it lacks specificity in discussing digital literacy as the foundation of civic education and places more emphasis on *trends mapping*. Another study by Sulkipani et al., (2025) which focuses on online civic education during the period 2005-2024. In his study, Sulkipani analyzes OLCE (Online Learning in Civic Education) keywords e-learning, MOOC, AI, and social media. Previous bibliometric studies (Safutri et al., 2025; Sulkipani et al., 2025) mapped civic education trends but did not explicitly position digital literacy as a conceptual foundation of civic competence. This study fills that gap by focusing on the integration of digital literacy within civic education discourse, identifying research patterns and key actors shaping its development.

Unlike previous studies that focused on online learning or general trends in digital literacy, this study specifically maps the relationship between digital literacy and civic education through Scopus bibliometric analysis. Neither study has positioned digital literacy as a key foundation of civic education, even though this aspect is increasingly urgent in the digital age. The main focus of this research is directed at contemporary issues such as disinformation, fake news, digital ethics, and critical thinking. By placing digital literacy as a conceptual foundation in the formation of responsible digital citizens, this approach will open new perspectives in the development of digital citizenship education theory and practice. Thus, the purpose of this research is to map the landscape of digital literacy research in civic education while strengthening the theory of digital citizenship education as a development of conventional civic education theory. The integration of digital literacy will expand the theoretical framework of learning, especially in civic education based on critical digital literacy, which is the ability to reflectively assess information and participate ethically in the digital public sphere.

METODE

This study uses a quantitative approach with a bibliometric method that serves to analyze bibliographic data and publication trends in publications (Diop et al., 2022). The bibliometric approach aims to identify publication productivity, patterns of collaboration between authors and countries, and the structure of knowledge that has been formed, while also providing an overview of the direction of research in the digital age. Through this analysis, this study provides a comprehensive overview of the direction and focus of research in the digital age.

The main data source was taken from the Scopus database, one of the largest internationally recognized scientific databases. The search strategy used a combination of keywords "*digital literacy*" OR "*digital competence*" OR "*media literacy*" OR "*digital citizenship*" OR "*civic education*" OR "*citizenship education*" OR "*democratic values*" and adding keywords "*machine intelligence*". Keywords *machine intelligence* intelligence to ensure the coverage of articles linking digital literacy with the latest developments in smart technology. This process produced a dataset that focused more on the issue of digital literacy in civic education learning in the era of digitalization. The search process was conducted on titles, abstracts, and keywords (TITLE-ABS-KEY). The literature search was conducted on the Scopus database for the period 2016–2025. The final search was conducted on September 14, 2025.

The selection procedure requires that each identified article be evaluated according to the PRISMA stages and standards through four stages, namely identification, screening, eligibility, and inclusion. The inclusion criteria include journal articles, articles in English in fields related to social sciences, computer science, arts and humanities, and psychology. Articles that have been published are also included. Irrelevant articles, such as non-academic proceedings or publications that do not focus on digital literacy and citizenship, are excluded from the dataset. The data collected in .csv format was analyzed using the Bibliometrix package in the R Biblioshiny and VOSviewer software. The analysis included publication trends at the document, author, country, and keyword co-occurrence levels to obtain an overview of the structure and dynamics of knowledge in this field.

The research questions in this study include four research questions, namely:

1. What are the trends in research publications on digital literacy in civic education for the period 2016-2025?
2. What are the most dominant themes, topics, and keywords in digital literacy research related to civic education in the digital era?
3. What are the patterns of collaboration between authors and between countries in digital literacy research on civic education in the digital age?
4. How does the direction of digital literacy research in civic education contribute to strengthening the concept of digital citizenship in the digital age?

After setting a search query aligned with the research focus, 123 articles were retrieved from the Scopus database. Next, these articles underwent further screening using the Scopus platform's filter feature. The selection process was carried out to ensure that

only publications truly relevant to the research objectives were analysed further. The relevance criteria were determined based on the suitability of the topic, abstract, keywords, and institutional affiliation listed in the publication metadata. This step was crucial for systematically distinguishing between articles that contributed directly to mapping global citizenship research in Indonesia and those outside the study's scope. Details of selection process and the characteristics of the publications analyzed are shown in Table 1.

Table 1. *Screening Criteria*

Screening Criteria	Description	Number of Document
Search String	<i>(TITLE-ABS-KEY ("digital literacy" OR "digital competence" OR "media literacy" OR "digital citizenship") AND TITLE-ABS-KEY ("civic education" OR "citizenship education" OR "democratic values") OR TITLE-ABS-KEY ("machine intelligence"))</i>	253
Year	2016-2025	240
Document type	Article	160
Language	English	145
Subject area	<i>Included: Social sciences, computer sciences, arts humanities, psychology Excluded: engineering, multidisciplinary, business, management and counting, environmental sciences decision sciences, mathematics, energy, economics, econometric and finance, physics and astronomy, medicine, materials science, health professions, and chemical engineering</i>	138
Publication stage	Final	123
Keyword	Not selected	-
Affiliation	Not selected	-
Funding sponsor	Not selected	-
Country/territory	Not selected	-
Source type	Journal	123
Total	123 journal articles	123

Based on the data screening process in Table 1, 123 scientific articles related to digital literacy in the context of civic education were successfully identified. However, not all of these publications explicitly discuss the topic of digital literacy, given that the search process was not accompanied by screening based on specific keywords. Nevertheless, the

data collection was obtained through a careful selection process, with restrictions applied in the formulation of the search query, so that it still reflected the relevance to the focus of the study. With restrictions applied in the formulation of the search strategy, the data source selection process then followed the stages and standards of PRISMA in conducting a systematic literature review. This procedure was carried out in stages through three sequential phases, namely: (a) identification, (b) screening, and (c) feasibility assessment. The visualization of the results in the second screening stage is presented in Figure 1, which illustrates the flow and number of publications at each stage of the selection process.

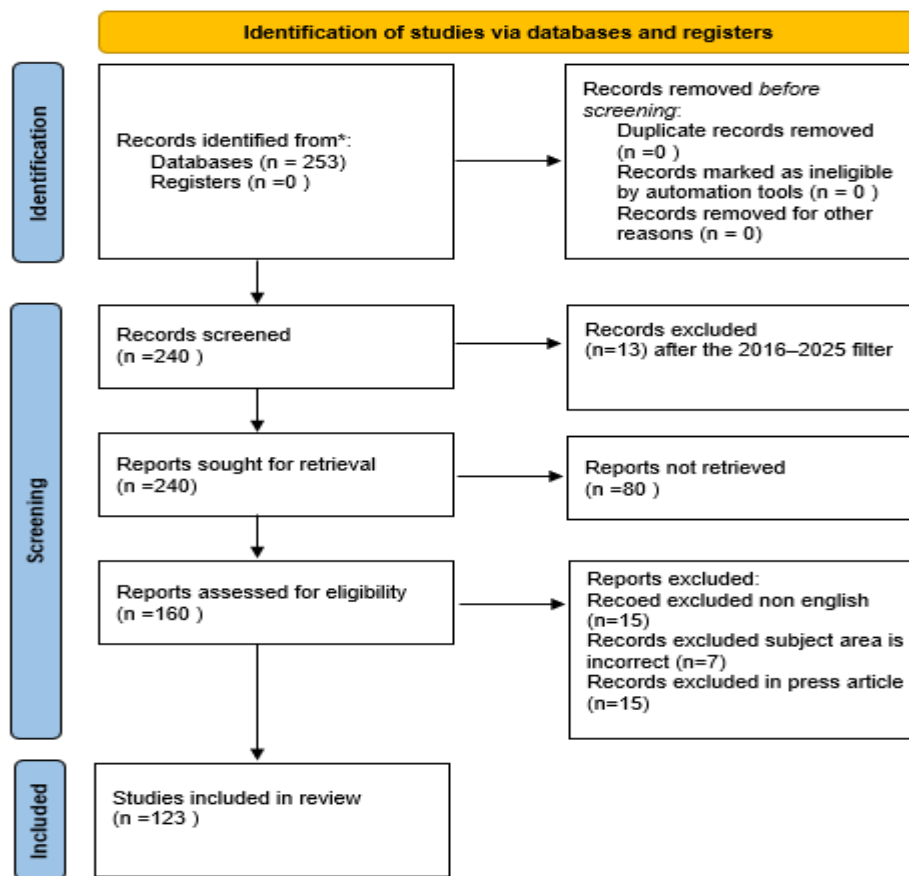


Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

This analytical framework describes a systematic bibliometric research process that includes: (1) data identification through the Scopus database, (2) article screening using the PRISMA protocol, (3) data processing in.csv format with R Biblioshiny and VOSviewer software, (4) bibliometric analysis covering publication trends, author collaboration, and theme mapping, and (5) interpretation of results to answer research questions.

Digital literacy and Civic Education

Digital literacy is a crucial aspect of modern life today. Through a critical and relevant pedagogical approach, digital literacy plays an important role in shaping active citizens who are able to participate reflectively in cross-space digital communication

(Iskandar et al., 2025; Robinson-Pant, 2023) This urgency emphasizes the need to equip individuals with the skills to use technology wisely, ethically, and responsibly. Digital literacy is not merely a technical skill, but an important foundation in shaping young citizens to be active, critical, and responsible. Through comprehensive mastery of digital literacy, the younger generation is expected to be able to participate reflectively and constructively in digital society (Iskandar et al., 2025; Jiang & Gu, 2022). The results of the bibliometric analysis show that research on digital literacy in civic education in the period 2016–2025 with title-abs-key amounted to 253 articles identified in the initial stage, with 123 articles declared relevant after going through the PRISMA selection process.



Figure 2. *Main Information about Data*

Source: R BBiblioshiny

Scopus data was collected on September 14, 2025. The trend of publications on digital literacy in civic education in the period 2016–2025 shows an increase from year to year. In the early phase, the number of publications increased consistently, ranging from three to thirteen articles. However, in 2020, there was a decrease in the number of publications to nine documents. Then in 2021, the number of publications increased slightly again. The year 2022, with a total of twenty-three documents, marked a significant jump compared to previous years. After that, publications tended to fluctuate but remained at a relatively high level, namely nineteen documents in 2023 and twenty-one documents in 2024. Meanwhile, data for 2025 shows a decline to thirteen documents.

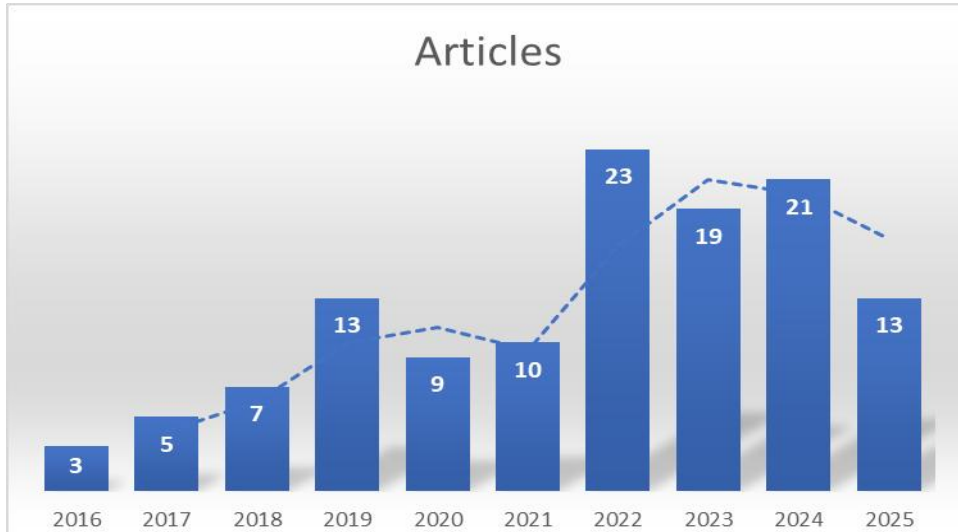


Figure 3. Trends in Digital Literacy Publications in Civic Education

Source: R Biblioshiny visualisasi Excel

In addition to looking at the total number of annual publications, trend analysis can also be expanded through visualization of *Countries' Production over Time*. This graph allows for the identification of each country's contribution over a certain period of time, as well as revealing patterns of growth, stability, or fluctuations in scientific production. For example, the United States has shown consistent dominance since before 2018, with a sharp surge after 2020 and remaining at the top until 2025. Meanwhile, Indonesia has experienced significant growth after the pandemic, with the sharpest growth occurring between 2022 and 2025. China shows a more stable and gradual trend, while European countries such as Portugal and Spain show moderate but consistent growth. By using *Countries' Production over Time*, the analysis becomes more contextual as it shows how geopolitical dynamics, education policies, and responses to global issues such as the COVID-19 pandemic have influenced the intensity of publications in each country.

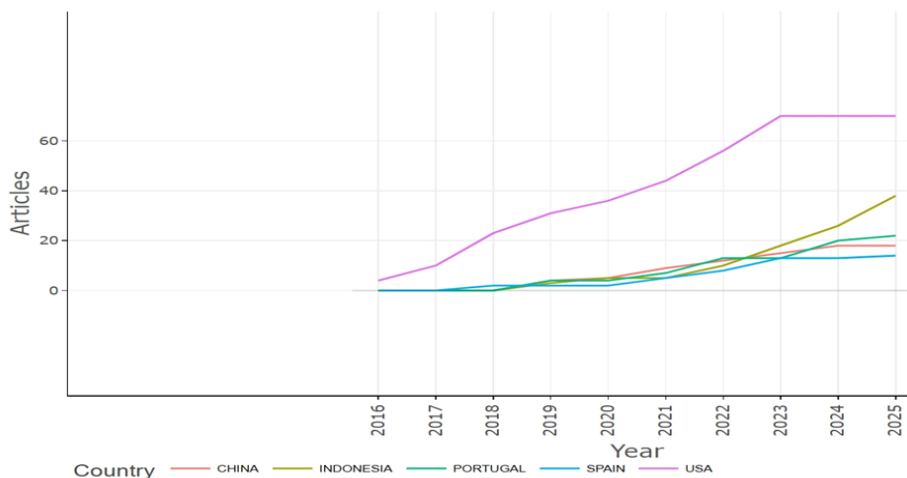


Figure 4. Countries' Production over Time 2016-2025

Source: R Biblioshiny

Furthermore, the results of mapping research keywords through the Co-occurrence Network using R biblioshiny show that studies of digital literacy in the context of civic education focus on terms such as digital citizenship, civic education, citizenship education, and media literacy. These findings confirm that the main focus of the research is the formation of digitally literate citizens who have digital literacy skills and are able to participate critically in democratic life. Other research focuses with supporting keywords such as social media, disinformation, critical thinking, global citizenship, online learning, digital ethics, digital citizenship education, digital media, and fake news indicate that the issues frequently discussed are related to the challenges of the digital age, particularly in terms of ethics, information security, and critical thinking skills. Thus, digital literacy in this study is not only understood as a technical skill, but also as an integral part of citizenship education that emphasizes democratic participation and media ethics amid the rapid spread of disinformation and technological advances.

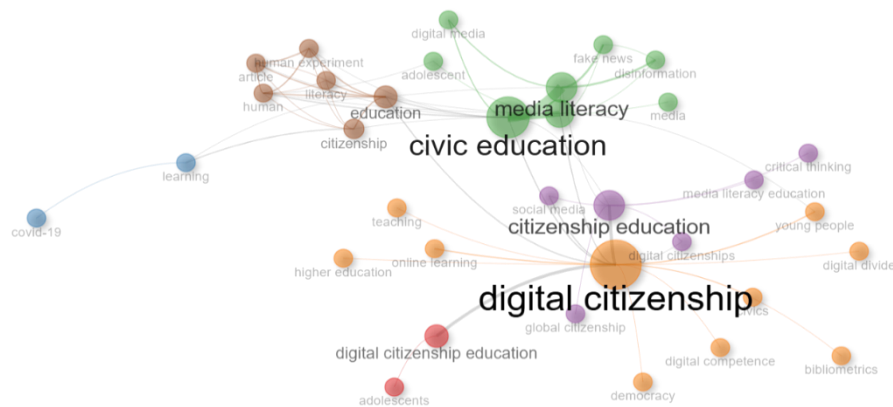


Figure 5. *Co-occurrence Network*

Source: R biblioshiny

Furthermore, the results of thematic mapping using VOSviewer software in the study of digital literacy in civic education can be categorized into five main clusters. The red cluster focuses on digital citizenship, social media, online learning, COVID-19, and citizenship. The orange cluster focuses on civic education, education, digital media, literacy, disinformation, and civic competence. The blue cluster focuses on media literacy, students, disinformation, and digital literacy. The green cluster focuses on critical citizenship education, curricula, medium literacy, college students, and curriculum reform. The yellow cluster focuses on digital citizenship education, concept analysis, democracy, and civics. The light green cluster is a minor cluster that focuses on literacy infrastructure and communication in COVID-19.

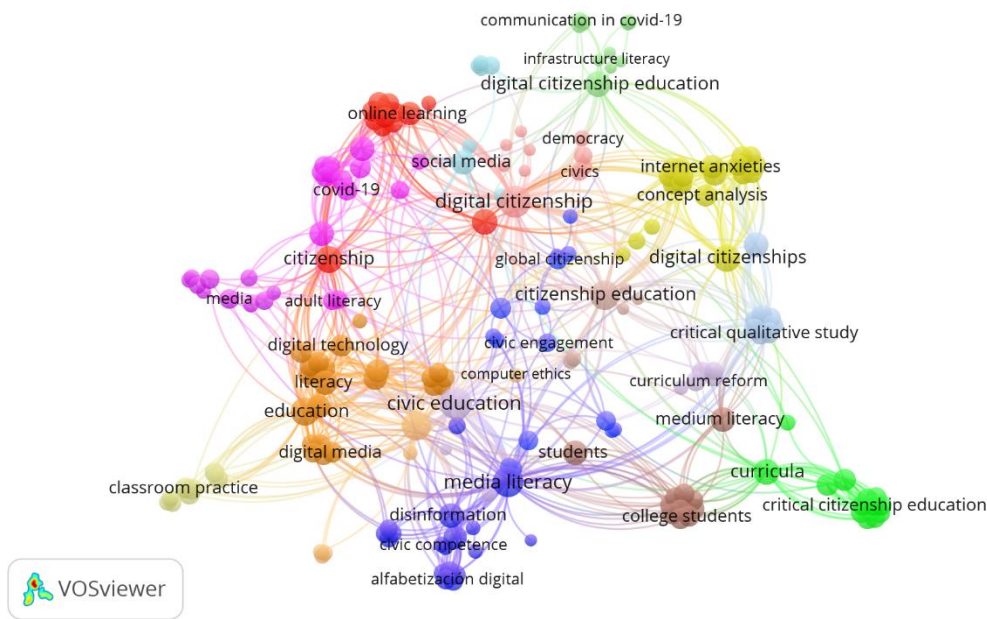


Figure 6. *Thematic Map*
Source: VOSviewer

The results of the Most Relevant Authors graph analysis from R Biblioshiny show that research on digital literacy in the context of civic education is still heavily influenced by the contributions of a number of core authors. The three most prominent names are Choi, Moonsun, Kahne, Joseph E., and McGrew, Sarah C., each with 5 publications. Their consistency in publishing works shows their central position as core authors who actively shape the direction and main discourse in this field. Below them are Breakstone, Joel and Komalasari, Kokom with 4 publications, who also contribute significantly to the development of the discourse on digital literacy and civic education. Furthermore, groups of authors such as Bowyer, Benjamin T., Cristol, Dean S., Ortega, Teresa, Smith, Mark D., and Wineburg, Sam S. each have 3 publications, indicating that they are also quite active in this field, although their contributions are not as significant as those of the core group.

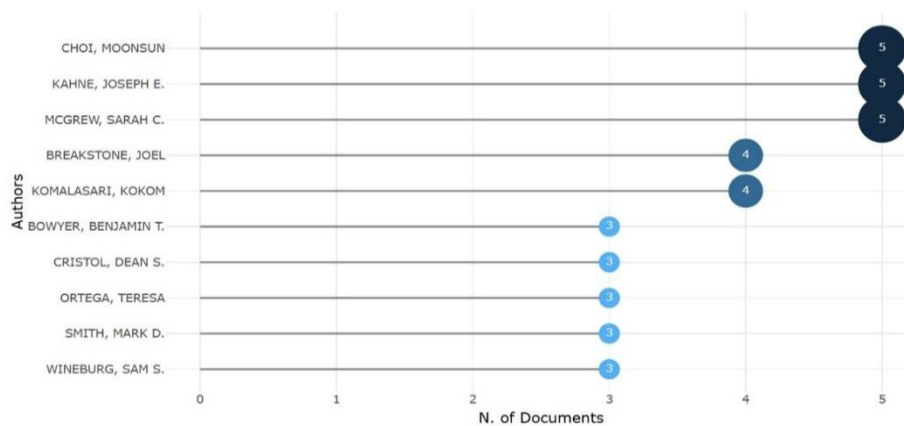


Figure 7. *Most Relevant Author*
Source: R Biblioshiny

Based on the R biblioshiny analysis data Most Relevant Affiliation above, it shows that the Indonesia University of Education (UPI) ranks first as the institution with the largest contribution to publications on digital literacy in civic education, with a total of 14 articles. In the next position is The Education University of Hong Kong with 10 articles, followed by Stanford Graduate School of Education with 9 articles. Other institutions that also show high productivity include Jakarta State University with 8 articles and Stanford University with 7 articles. The same number of articles was also achieved by The University of Hong Kong, Universidad Nacional de San Agustin de Arequipa, and University of California, each contributing 7 articles. The Ohio State University and Universidade do Porto complete the top ten list with 6 articles each, indicating a consistent contribution to the development of digital literacy and civic education studies at the global level.

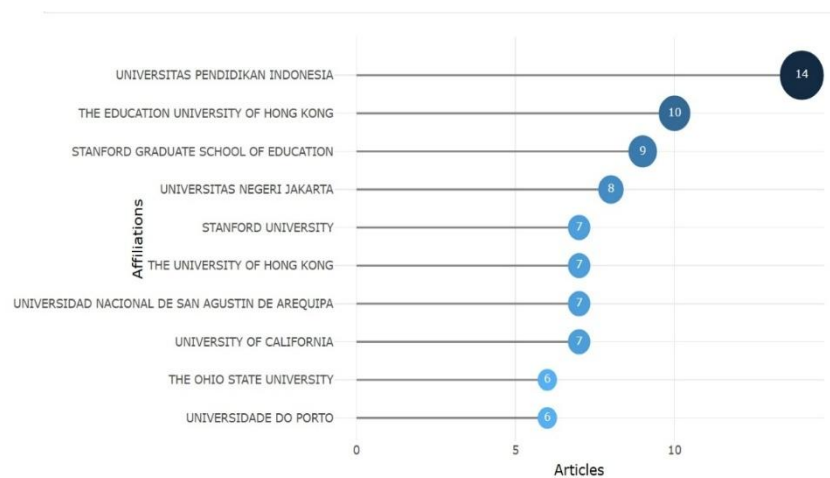


Figure 8. Most Relevant Affiliation
Source: R Biblioshiny

Table 2 shows the top ten countries contributing to research on digital literacy in civic education during the 2016–2025 period. The United States ranks first with 70 publications, demonstrating its dominance and maturity in this research domain. Indonesia follows in second place with 38 publications, indicating a rapidly growing academic interest in digital literacy and civic education in the Global South. Portugal (22) and China (18) also make notable contributions, reflecting active engagement from both European and Asian regions. Meanwhile, countries such as Spain (14), the United Kingdom (13), India (11), Peru (9), Ukraine (9), and Germany (8) contribute smaller yet consistent outputs. Overall, these results illustrate that research on digital literacy in civic education has become a cross-regional topic involving collaboration between developed and developing nations.

Table 2. Countries' Scientific Affiliation

Country	Freq
USA	70
INDONESIA	38

PORTUGAL	22
CHINA	18
SPAIN	14
UK	13
INDIA	11
PERU	9
UKRAINE	9
GERMANY	8

Data from the mapping of biblioshiny R on the collaboration network Co-Authorship shows that collaboration is concentrated in the orange cluster, which is the most productive group of authors with the highest level of connectivity. This cluster is thought to form a kind of specialized research community that actively develops digital literacy studies in civic education. On the other hand, there are several small, isolated clusters, such as the green, purple, brown, and pink clusters, each consisting of only two to three authors. This pattern indicates limited collaboration, most likely in the form of independent research or cooperation within the scope of small projects that are not continued systematically. Interestingly, the analysis also shows the absence of bridging authors, namely authors who act as connectors between clusters. The absence of these connecting figures shows that the research network is still fragmented and has not yet formed a globally integrated collaborative ecosystem.

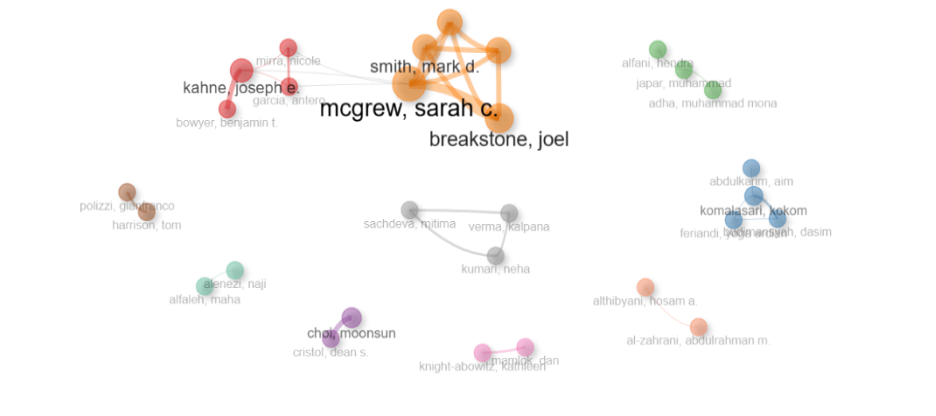


Figure 9. *Collaboration Networking Co-Authorship*

Source: *R Biblioshiny*

DISCUSSION

Publication Trends in Digital Literacy Civic Education Learning 2016-2025

Analysis of annual publication trends on digital literacy in civic education shows a fluctuating pattern with an overall upward trend in studies of digital literacy in the context of civic education. In 2019, there were 13 documents that marked the initial phase of increased attention to this issue. However, the number of publications decreased in 2020

to 9 documents, and only slightly increased in 2021 to 10 documents. This decline was due to the initial disruption caused by the COVID-19 pandemic, which delayed research and publication processes in various countries. Nevertheless, the trend showed a significant increase again in 2022 with 23 documents, reflecting the consolidation of research directions after the adaptation period to the pandemic. This time frame reflects three important phases, namely pre-pandemic digital adoption (2016-2019), pandemic-driven transformation (2020-2021), and the digital era (2022-2025). However, most of the previous studies focused on digital literacy in the context of social media or general education (Balcytiene et al., 2025; Castellví et al., 2021), while its relevance to civic education has not been a major concern. The COVID-19 pandemic itself has been a catalyst for the transformation of digital learning, encouraging rapid adaptation to the online learning environment (Hutabarat, 2023; Lestari & Machmudah, 2023). This surge confirms that digital literacy is increasingly seen as a fundamental competency in civic education in the digital age, not merely as a technological skill, but also as a means of shaping ethical awareness, critical participation, and civic responsibility in the digital space. Digital competency plays an important role in improving individuals' ability to access digital media effectively, while also understanding and critically evaluating multimedia content (Suing et al., 2023). Therefore, a comprehensive bibliometric analysis is needed to map the landscape of digital literacy research in civic education during that period, filling existing gaps in the study and providing an overview of the direction of research development in the digital age.

Mapping Trends in Digital Literacy Themes, Topics, and Keywords

Keyword analysis reveals the dominance of digital citizenship, civic education, and media literacy core themes in digital literacy discourse. Digital citizenship serves as a foundational framework for responsible online behavior, requiring ethical awareness, understanding of digital rights and duties, and sensitivity to issues like privacy and disinformation to foster a safe and inclusive digital ecosystem. Therefore, strengthening the values of digital citizenship plays a strategic role in fostering tolerance, mutual respect, and appreciation for diversity in digital interactions (Iskandar et al., 2025; Japar et al., 2024; Sidharta et al., 2022). In the context of civic education, digital literacy serves as a bridge between technological competence and an understanding of democratic values. Through mastery of digital literacy, students are trained to critically search for, evaluate, and utilize information, while also developing ethical responsibility in interacting in an increasingly complex digital space. In line with this, civic education aims to foster informed and active citizens who can participate and contribute to social discourse through digital platforms. Civic education is directed at training students to think critically and responsibly in using digital information through the integration of civic reasoning in learning. (Fajri et al., 2022; McGrew & Breakstone, 2023). In addition, a number of supporting keywords such as social media, disinformation, critical thinking, global citizenship, online learning, digital ethics, digital citizenship education, digital media, and fake news enrich the research landscape, while reflecting the complexity of issues faced in the digital public sphere. These findings

indicate that citizenship education is no longer solely oriented towards technical skills, but has shifted towards the formation of value competencies that include democracy, active participation, and social responsibility.

Collaboration Between Authors and Countries Digital Literacy

In terms of author and country distribution, bibliometric analysis using R Biblioshiny on the *Co-authorship network* shows that research on digital literacy in civic education learning is still dominated by several large clusters, namely the *orange* cluster, which is the center of scientific activity, and several other clusters that are also productive in digital literacy research. However, several small clusters (green, purple, brown, and pink) are still individual in nature and have not yet formed a sustainable collaborative network. The lack of bridging authors or authors who strengthen clusters will hinder the exchange of ideas, the dissemination of methodological innovations, and the formation of theoretical paradigms.

Publications in the field between countries are dominated by the United States and Indonesia. The dominance of the United States is understandable given the established research infrastructure and the high level of attention to the issue of digital citizenship in the context of education. On the other hand, the significant contribution from Indonesia reflects that digital literacy in civic education has become an increasingly important focus in the national education agenda. This strong position of Indonesia in the global bibliometric map can be attributed to several contextual factors. First, at the policy level, the Indonesian government has launched large-scale initiatives such as the National Digital Literacy Movement (GNLD) and the Digital Talent Scholarship Program under the Ministry of Communication and Informatics, as well as curriculum reforms emphasizing digital competence and civic values through the Merdeka Curriculum. These initiatives have stimulated academic attention to digital literacy as part of civic education. Second, from an epistemological perspective, Indonesian scholarship tends to integrate moral, cultural, and Pancasila-based ethics into the framework of digital literacy, producing a unique hybrid model that differs from the more technocratic or behavioral orientations found in Western research. Consequently, Indonesia's increasing contribution not only reflects quantitative growth in publications but also the emergence of alternative paradigms in understanding digital citizenship rooted in social values, collective responsibility, and ethical participation in the digital public sphere.

However, the level of cross-country and cross-institutional collaboration is still relatively low, which limits the global perspective in the development of academic discourse. The dominance of research from the United States shows a strong focus on strengthening citizen participation through digital engagement and online democratic practices. Conversely, the strong contribution of Indonesian scholars highlights a digital literacy approach grounded in moral values and civic ethics. Rather than posing a barrier, this divergence invites cross-cultural collaboration to develop a more inclusive and context-sensitive understanding of digital citizenship, attuned to each nation's social and cultural realities

The Development of Digital Literacy in Civic Education

This study provides important implications for strengthening civic education, which is not limited to the formal school setting, but also encompasses social spaces, communities, and increasingly complex digital ecosystems. Bibliometric findings show that the discourse on digital literacy in civic education learning has moved from a normative approach to a participatory paradigm, in which citizens are positioned as active subjects in the digital public sphere. Therefore, civic education is no longer sufficient to emphasize the internalization of moral values, but must integrate digital literacy skills that enable individuals to think critically, be ethical in the media, and be able to assess and produce information responsibly. This is in line with the idea of critical digital literacy, which emphasizes reflective, ethical, and participatory aspects in media practices as a strategic cross-sector space involving educational institutions, digital communities, and policymakers to prepare critical, inclusive digital citizens who are committed to democratic values amid the rapid pace of technological transformation.

The rapidly developing digital era, aided by technological developments such as artificial intelligence, has significant transformative potential in the world of education, particularly through the application of personalized learning, adaptive assessment, and learning support tailored to the individual needs of students (Danurahman & Arif, 2021). In this context, digital literacy needs to be directed towards a new dimension that emphasizes ethics, civic participation, and the use of artificial intelligence in everyday life. Digital literacy, as evidenced by bibliometric trends, is both a civic and pedagogical imperative. When embedded in learning technologies such as management systems, simulations, and collaborative tools it cultivates meaningful civic participation through immersive digital engagement.

Digital literacy in civic education is not merely a technological skill, but also serves as an instrument for shaping digital civic awareness. Amidst the flow of disinformation, polarization of opinion, and the penetration of artificial intelligence, digital literacy occupies a strategic position in strengthening the democratic resilience of society. Findings from various post-pandemic studies indicate that digital transformation not only changes the way we learn, but also redefines the meaning of civic participation from physical participation to electronic participation based on ethics, responsibility, and critical reflection. Educational technologies ranging from AI-driven assessments to virtual debates and civic simulations are increasingly leveraged to cultivate ethical digital participation. Bibliometric patterns indicate a transition from traditional civic instruction to technology-mediated engagement

CONCLUSION

This study confirms that digital literacy plays a central role in civic education learning in the digital age. Through a bibliometric analysis of 123 articles indexed in the Scopus database (2016–2025), a number of important findings were discovered that reflect the dynamics and direction of developments in this study. Publication trends show a

significant increase after the COVID-19 pandemic, which also marks a paradigm shift in civic education from conventional spaces to the digital realm. Furthermore, the dominant themes that emerged included digital citizenship, civic education, and media literacy, with related issues such as disinformation, fake news, digital ethics, and critical thinking skills. These findings indicate that digital literacy is no longer understood solely as a technical skill, but rather as a strategic instrument in shaping critical and ethical civic awareness. However, the pattern of collaboration between authors and between countries still shows a fragmented tendency. Publications are dominated by the United States, followed by significant contributions from Indonesia, while the limited role of bridging authors signals the need to strengthen collaborative networks across institutions and cultures. This condition is both a challenge and an opportunity to broaden perspectives and enrich the discourse on digital literacy globally. Practically speaking, the results of this study emphasize the urgency of integrating digital literacy into the civic education curriculum, not only in terms of technological mastery, but also in terms of democratic participation, media ethics, and resilience to disinformation. Future research should deepen the integration of digital literacy in tech-enhanced learning, positioning educational technology as a driver of democratic and ethical digital citizenship.

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