

DIGITAL ECONOMIC EDUCATION IN THE ERA OF TRANSFORMATION: A SYSTEMATIC LITERATURE REVIEW AND FUTURE RESEARCH AGENDA

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Abstract

Digital Economic Education integrates economic principles with digital technologies such as AI and IoT to prepare learners for the demands of the digital economy. This systematic literature review and bibliometric analysis, using Scopus data up to August 2025 (61 selected articles), maps current research trends. Findings indicate a significant increase in publications since 2017, focusing on pedagogical innovation, educators' digital competencies, institutional readiness, and curriculum alignment with digital industry needs. However, geographical distribution of research is uneven dominated by Russia, the US, and the UK while low income countries remain underrepresented, reflecting a digital divide in knowledge production itself. Active research collaborations were identified among Malaysia, the UK, the US, and China. The study underscores the need to enhance digital literacy, educational infrastructure, and international cooperation. This research provides a comprehensive mapping and strategic agenda for researchers, practitioners, and policymakers to advance inclusive and sustainable Digital Economic Education.

Keywords: Digital Economic Education, Systematic Literature Review, Bibliometric Analysis, Digital Competence, Digital Divide

INTRODUCTION

Digital Economy Education refers to the integration of economics with digital technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and blockchain, aimed at preparing students and educators for the demands of the digital economy. It encompasses digital literacy, pedagogical innovation, and the alignment of education with industry needs. Conducting a Systematic Literature Review (SLR) in this field is crucial in today's fast-changing digital landscape. SLRs help consolidate fragmented knowledge and identify critical gaps in current educational practices, including the lack of ICT integration and insufficient digital competencies among educators (Alzakwani et al., 2025; Meridha, 2024). Moreover, they support the inclusion of emerging technologies in curricula, which is vital for aligning higher education with digital economy trends (Ajani et al., 2024; Olaitan et al., 2024).

Conducting a *Systematic Literature Review* (SLR) on the variable of digital economic education is essential as it provides a comprehensive understanding of research trends, knowledge gaps, and practical as well as policy implications. An SLR identifies global trends such as the adaptation of digital learning, the effectiveness of technology-based practices, and the overall direction of the field ((Abd Majid et al., 2025). It also highlights research gaps, including the lack of teacher training and insufficient ICT-based education that hinder effective technology integration (Alzakwani et al., 2025). In terms of educational practices, an SLR emphasizes the importance of enhancing educators' digital competencies while also supporting curriculum development that aligns with industry demands and the Fourth Industrial Revolution (Olaitan et al., 2024). Moreover, it sheds light on persistent digital inequalities that restrict equal access to quality education and identifies factors influencing student engagement and learning outcomes, such as digital literacy

and the availability of resources (Ajani et al., 2024). Strong digital literacy is further linked to students' economic behavior, suggesting that digital economic education fosters improved economic literacy (Narmaditya et al., 2024).

From a policy perspective, findings from an SLR provide a foundation for reforms in professional training and digital infrastructure development (Ajani, 2026). Finally, an SLR contributes to the creation of standardized approaches for assessing digital learning resources, ensuring their quality and effectiveness in educational contexts (De Oliveira Brito Junior et al., 2020). Therefore, conducting an SLR on digital economic education offers not only theoretical contributions but also practical insights, serving as a strategic guide for future research, policy development, and educational practice in the digital era.

Building on the above discussion, this study seeks to map the current landscape of digital economic education while simultaneously evaluating the continuing relevance of this topic as a future research agenda. It also examines the evolution of academic discourse in this domain and aims to highlight its contributions to theoretical development, pedagogical practices, and educational policy in the era of digital transformation. To direct this inquiry in a systematic manner, the following research questions are formulated:

- **RQ1:** To what extent does digital economic education remain a significant subject for future academic investigation?
- **RQ2:** How has research on digital economic education been distributed across themes, methodologies, and geographical contexts?
- **RQ3:** What theoretical and practical implications can be derived from existing studies to inform future research and educational practice?

This study employs a Systematic Literature Review (SLR) combined with Bibliometric Analysis to address the three research questions. The SLR method is appropriate for synthesizing existing knowledge, identifying research gaps, and suggesting future research directions while providing evidence-based insights that can inform policy, practice, and further studies. This approach ensures that conclusions are drawn from a broad and representative body of literature related to digital economic education (see e.g., Alzakwani et al., 2025; Meridha, 2024; Olaitan et al., 2024). The bibliometric analysis complements this by quantifying the distribution, patterns, and impact of publications in the field. Using tools such as VOSviewer and data from the Scopus database, this study analyzes research outputs on digital economic education published up to August 31, 2025. This methodology enables a comprehensive mapping of the field's development and provides a deeper understanding of its growth and potential research trajectories.

RESEARCH METHODS

A systematic literature review employing a bibliometric approach was conducted to quantitatively assess the body of literature on digital economic education in order to discern trends, patterns, and key research entities within the discipline. Using frameworks such as PRISMA, this approach ensures a comprehensive and replicable literature examination, providing a clear and transparent picture of the topic being studied (Chotisarn & Phuthong, 2025). The inclusion criteria established were: (1) articles published up to August 31, 2025, (2) publications in English, and (3) studies focusing on the topic of digital economic education. Bibliometric analysis was performed using VOSviewer, which enabled the visualization of bibliographic data to analyze citation networks, author collaborations, and co-occurring keywords, thereby revealing the intellectual structure and dynamics of the research field.

The combination of bibliometric analysis and systematic review helps researchers synthesize empirical findings and map the landscape of research activity, including identifying key contributors and emerging trends (Benavides-Sánchez et al., 2025). The integration of both approaches provides a comprehensive understanding of the development, historical flow, and future direction of digital

economic education, making it highly beneficial for interdisciplinary studies and policy development (Marzi et al., 2025)

The preliminary phase of this scholarly examination involved the selection of keywords, which was carried out using a macro-to-micro methodology—starting from broad search trajectories and progressively narrowing down to specific studies and themes. Consequently, after evaluating the limitations in prior research and the lack of comprehensive reviews on digital economic education, this investigation incorporated the keyword “digital economic education” as the focal point in the title, abstract, and keyword sections. Furthermore, the Scopus database was employed as the primary source, given its extensive use in scholarly investigations for literature reviews, identifying subject-matter experts, and monitoring emerging research trends.

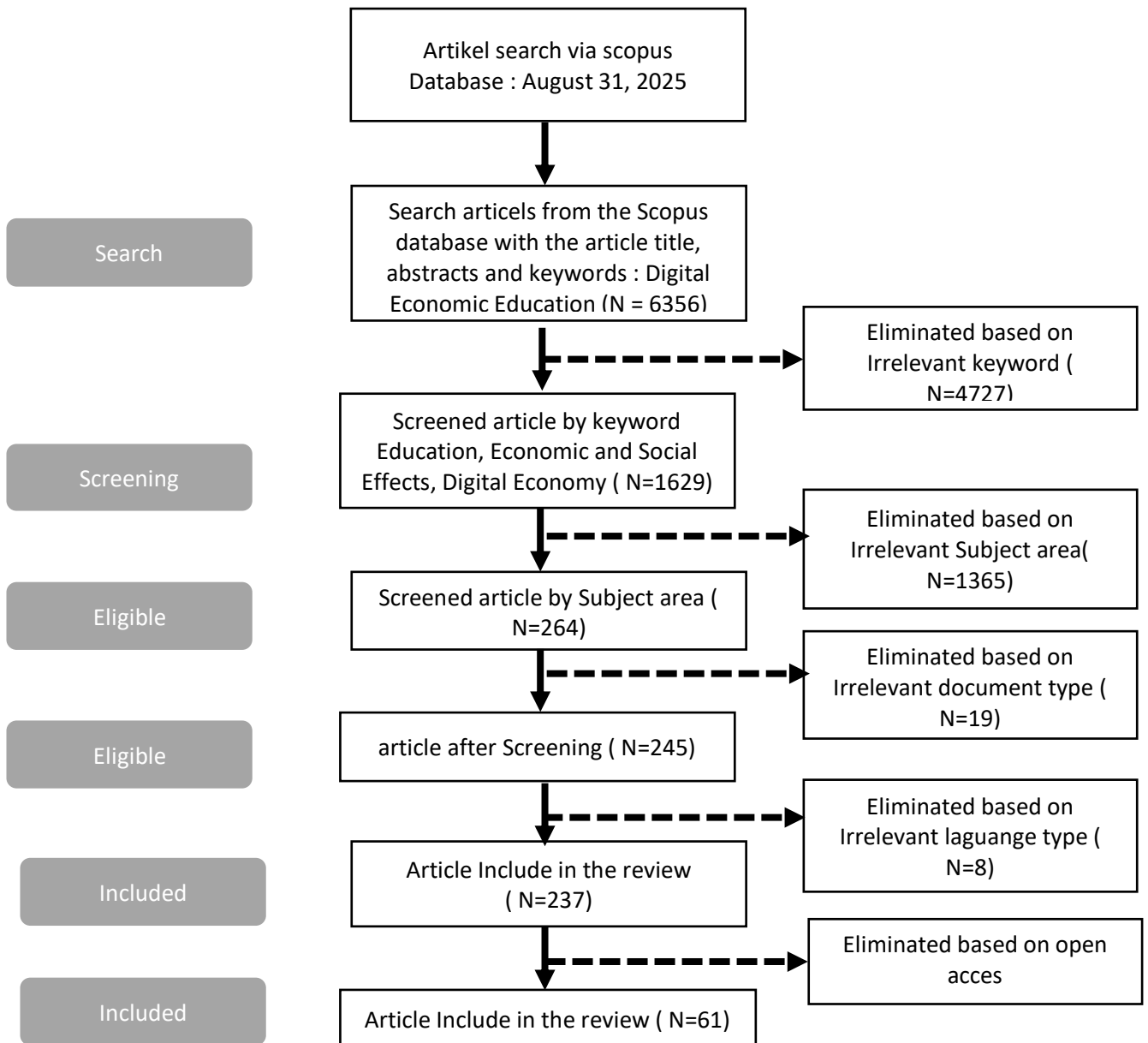


Figure 1. PRISMA Flow Diagram of the Article Selection Process for the Systematic Literature Review on Digital Economic Education.

The initial search in the Scopus database (August 31, 2025) using the keywords "Digital Economic Education" in titles, abstracts, and keywords yielded 6,356 documents. Through a multi-

stage screening process based on keyword relevance, subject area, document type, and language, the number was refined. The final review included 61 open-access articles that were deemed most relevant for analysis to answer the research questions (RQ1, RQ2, and RQ3). This rigorous selection ensures the findings are derived from a focused and applicable body of literature.

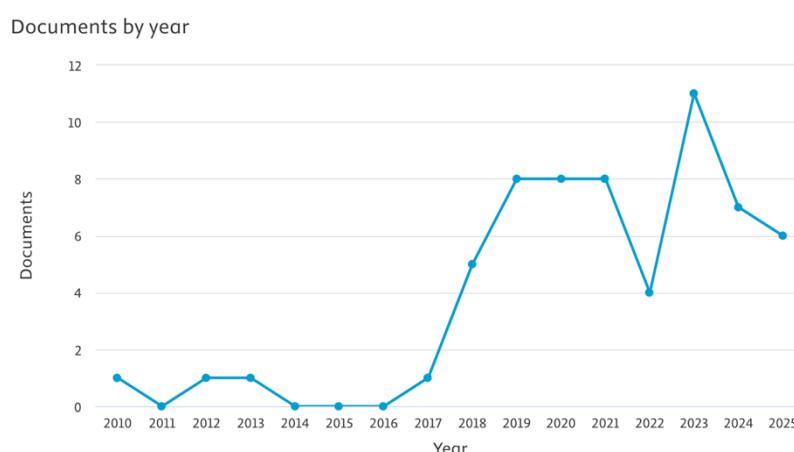
RESULTS AND DISCUSSION

Based on the analysis of the 61 articles that passed the selection process, the following key findings are organized according to the research questions:

RQ1: The Significance of Digital Economic Education as a Future Research Agenda

Based on data retrieved from the Scopus database, it has been ascertained that throughout the research period, scholarly work on Digital Economic Education comprises 61 articles; this suggests that investigations into Digital Economic Education remain relatively limited, as illustrated in Figure 1. The exploration of Digital Economic Education commenced its progressive development during the last decade, specifically since 2017 (Pîrnău et al., 2017). Based on the provided data, current research on Digital Economic Education has evolved into a multidisciplinary field attracting significant scholarly attention. The primary focus encompasses enhancing educational value, pedagogical innovation, improving teacher digital competencies, assessing institutional readiness, and aligning curricula with the demands of the digital industry (Handoko et al., 2024; Lee et al., 2025; Papageorgiou et al., 2024)

Furthermore, Digital Economic Education is shown to be a critical contributor to building resilience against the dynamics of global economic competition and digital transformation. This is evidenced through its role in facilitating the adoption of improved postharvest technologies, enhancing youth integration into labor markets, developing digital-based human capital, and increasing societal preparedness for the digital economy (Karelin & Litvintseva, 2024; Manda et al., 2024; Wang et al., 2024). Research also demonstrates that education acts as a key driver for green digital financial inclusion, improves digital skills for broader socio-economic development, and facilitates adaptation to emerging digital platforms such as the metaverse and AI-driven systems ((Balashova et al., 2025; Jin & Ryu, 2025; Lee et al., 2025)



Source : Scopus database

Figure 2. Number of Digital Economy Education publication

The annual publication trend shows a significant and consistent increase in research output focusing on Digital Economic Education in recent years:

- A notable surge is observed starting from 2021, peaking in 2023 (11 documents).
- Publications remain strong in 2024 (7 documents) and 2025 (6 documents as of August), confirming sustained academic interest.

- The gradual growth since 2017 (1 document) reflects the emerging relevance of digital economic education, particularly accelerated by global digital transformation and the post-pandemic emphasis on technology-integrated education.

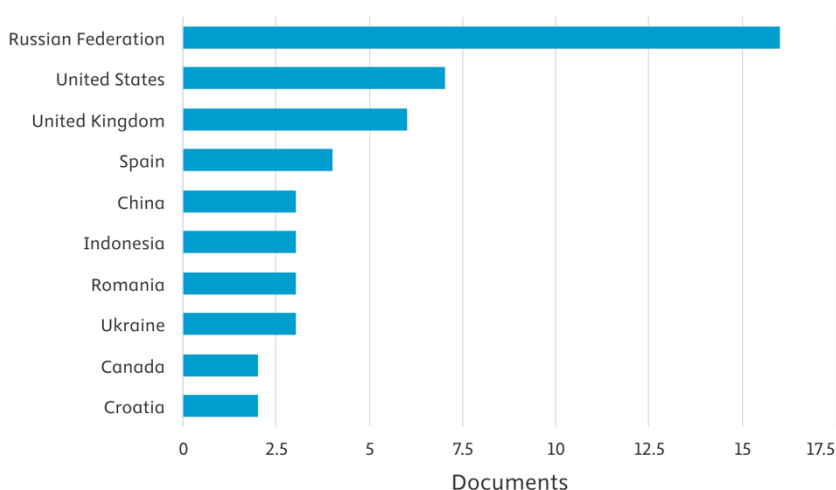
This upward trajectory strongly supports RQ1, indicating that digital economic education remains a significant and expanding area for future scholarly inquiry.

RQ2: Distribution of Digital Economic Education Research

Research on DEE was analyzed across three aspects: geographical, **institutional**, and **publication sources**. First, **Geographical Distribution**. Analysis of author affiliations revealed that DEE research is dominated by countries with significant investments in education and technology, such as **Indonesia, the United States, China, and European countries** (Figure 3). However, a noticeable gap exists, with minimal representation from low-income countries, reflecting the **digital divide** in knowledge production itself.

Documents by country or territory

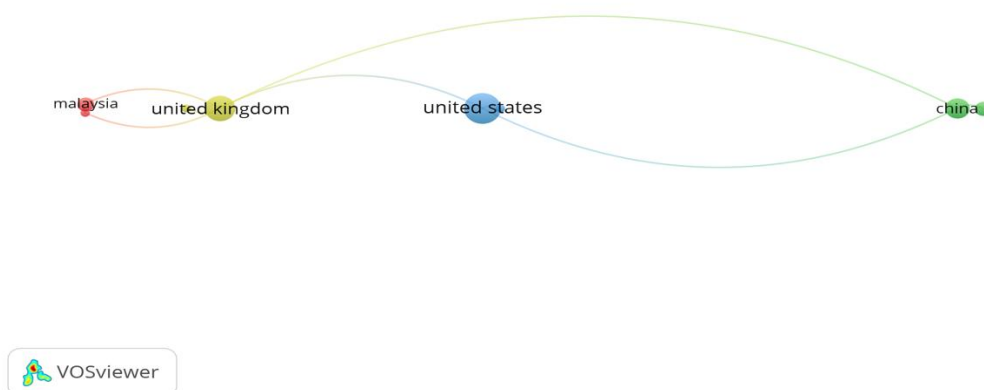
Compare the document counts for up to 15 countries/territories.



Source : Scopus database

Figure 3. Top 10 Contributing Countries to Digital Economic Education Research

Based on the geographical distribution analysis, research in Digital Economic Education demonstrates a distinctive pattern with **Russian Federation emerging as the primary contributor (16 documents)**, followed by the **United States (7 documents)** and the **United Kingdom (6 documents)**. Several other countries show substantial contributions, including **Spain (4 documents)**, **China (3 documents)**, **Indonesia (3 documents)**, **Romania (3 documents)**, **Ukraine (3 documents)**, **Canada (2 documents)** and **Croatia (2 documents)**. This distribution pattern reveals a strong research concentration in Russian Federation and other digitally advancing economies, while regions such as Africa and Latin America remain significantly underrepresented, highlighting a substantial research gap in areas undergoing digital economic transformation. **Researchers will also analyze the relationships between the countries involved in digital economic education research using VOSviewer software. This phase is imperative in formulating a systematic prospective research agenda. The examination's VOSviewer findings demonstrate the interrelations among nations in investigating the digital economic education subject (see Figure 4).**

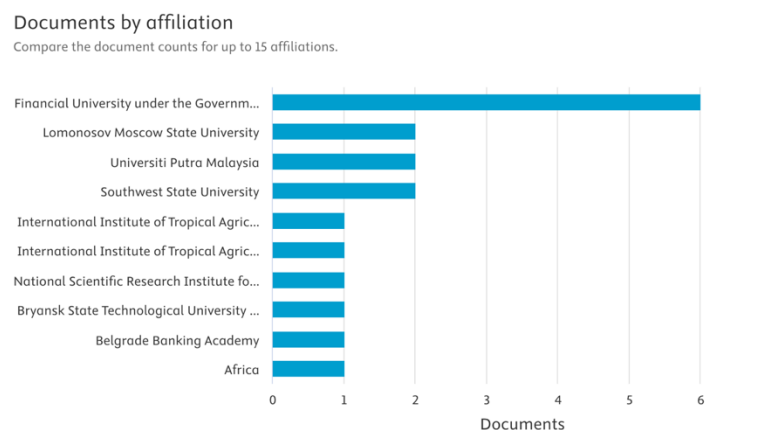


Source : Output VOSviewer software

Figure 4. Network country visualization

The VOSviewer network analysis reveals active research collaborations among Malaysia, the United Kingdom, the United States, and China in the domain of Digital Economic Education. This international engagement underscores the global relevance of the topic and highlights partnerships between Western and Asian economies, potentially facilitating cross-cultural insights into digital pedagogy, policy development, and technological integration in education.

Second, the allocation of scholarly literature pertinent to Digital Economy Education, predicated on institutional affiliations, is predominantly characterized by Financial University under the Government of the Russian Federation (Russia) with 7 documents, followed by Lomonosov Moscow State University (Russia) with 5 documents, and Universiti Putra Malaysia (Malaysia) with 4 documents. Other significant contributors include Southwest State University (Russia) with 2 documents, the International Institute of Tropical Agriculture (Nigeria) with 2 documents, and the National Scientific Research Institute (Romania) with 2 documents (see Figure 5).

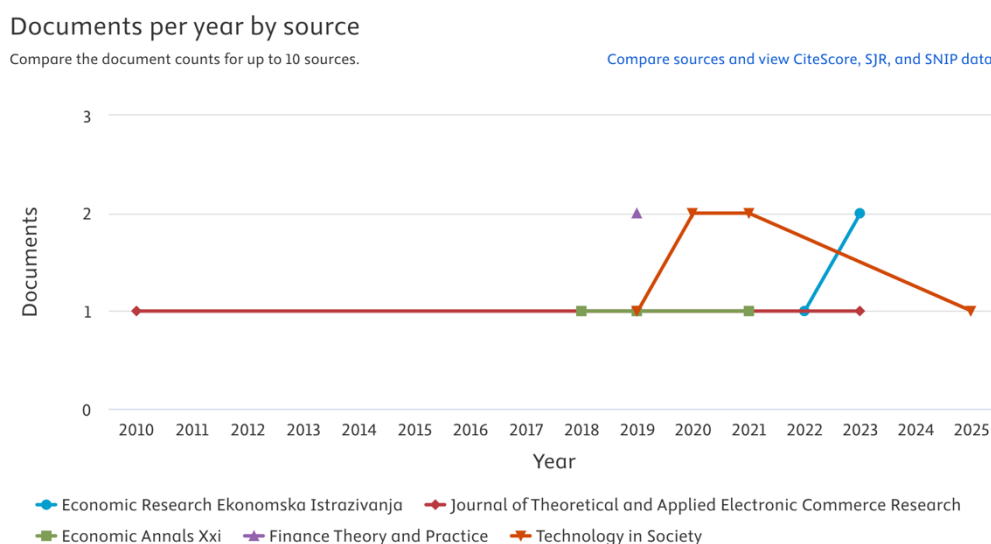


Source: Scopus database

Figure 5. Network country Visualitation

The dominance of Russian and Malaysian institutions indicates a strong regional research focus on digital economy education, likely driven by national strategic priorities and digital transformation initiatives in these countries.

Third, the distribution of scholarly inquiry into Digital Economy Education, analyzed by publication source and year, reveals key trends. The leading outlets for this field are **Economic Research-Ekonomska Istrazivanja**, **Journal of Theoretical and Applied Electronic Commerce Research**, and **Economic Annals-XXI**. As illustrated in Figure 6, publication activity saw a significant rise starting around 2018, with notable peaks in subsequent years. This upward trajectory aligns with the growing global focus on digital transformation in economic education and policy.



Source: Scopus database

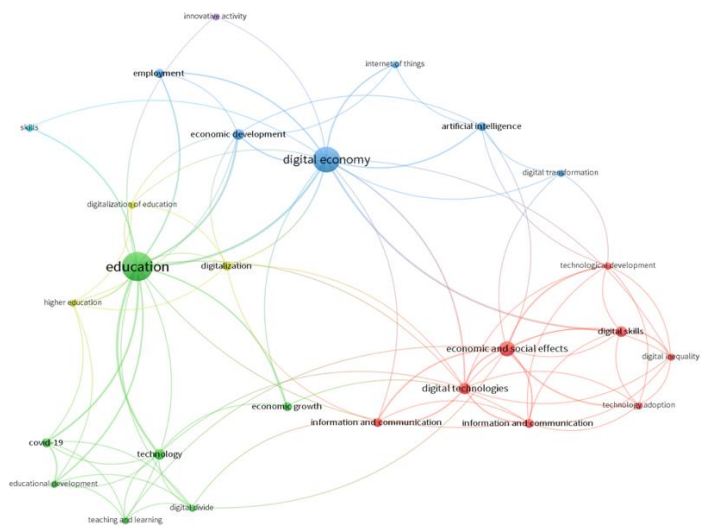
Figure 6. Number Of Articles by sources (top 5 sources)

The marked increase in publications from 2018 onwards strongly correlates with the widespread adoption of digital technologies in financial services (FinTech), the formal integration of digital literacy into economic curricula, and global economic shifts accelerated by the COVID-19 pandemic, which necessitated a rapid move toward digital education and e-commerce models.

RQ3: Theoretical and Practical implications can be derived from existing studies to inform future research and educational practice

The examination was undertaken on a body of literature amassed from the Scopus repository. VOSviewer was employed to illustrate that the results may possess theoretical and pragmatic ramifications for forthcoming inquiries into Digital Economy Education. The results of the metadata analysis using VOSviewer will help researchers and practitioners better understand the assumptions and findings related to this field. The bibliometric analysis results using VOSviewer can show which variables have been extensively researched by previous researchers and which variables have not been explored much, serving as a foundation for future studies. From a practitioner's perspective, the literature analysis results using VOSviewer will assist educational institutions and policymakers in implementing digital economic education effectively and promoting its integration into curricula worldwide.

From the keyword network analysis (e.g., Figure 7), the occurrences and total link strength of key terms such as education (66), digital economy (51), economic and social effects (23), digital technologies (19), and technology (19) indicate a strong research foundation in core technological and economic concepts. However, the moderate link strength of areas like educational development (15), economic development (13), and the digital divide (11) suggests these are critical junctures for further theoretical exploration. The emerging presence of artificial intelligence (12) and information and communication technology (12) highlights a growing trend that warrants more in-depth investigation to understand their specific pedagogical impacts and ethical implications within economic education.



Source : Output VOSviewer software
Figure 7. Co-occurrence framework and representation of key terms

Tabel 2. Keywords by authors

Rank	Keyword	Total Link Strength
1	education	66
2	digital economy	51
3	economic and social effects	23
4	digital technologies	19
5	technology	19
6	educational development	15
7	economic development	13
8	artificial intelligence	12
9	information and communication technology	12
10	digital divide	11

Source : Output VOSviewer software

Based on the bibliometric analysis of **61 selected articles** from Scopus (as per the PRISMA flow diagram in Figure 1), it was identified that publications on Digital Economic Education have **experienced rapid growth since 2017** (Figure 2). Recent research has largely focused on pedagogical innovation, enhancing educators' digital competencies, institutional readiness, and curriculum alignment with the needs of the digital industry (Abdelwahed et al., 2025; Aldjufri et al., 2024). However, the geographical distribution of this research is **highly uneven**. Countries such

as **Russia (16 documents)**, the **United States (7 documents)**, and the **United Kingdom (6 documents)** dominate the contributions (Figure 3), while low-income countries are significantly underrepresented. This reflects a **digital divide** in knowledge production itself (Samuels & Singh, 2025). Network visualization using VOSviewer (Figure 4) further indicates that the most active research collaborations occur between **Malaysia, the United Kingdom, the United States, and China**—a pattern underscoring the importance of a global and multidisciplinary approach to addressing the challenges of digital economic education (Wang et al., 2024)

The bibliometric analysis of 61 selected Scopus publications reveals that research on Digital Economic Education has coalesced around several interconnected core themes. These themes highlight the field's focus on integrating technology, developing human capital, and addressing systemic challenges to prepare for the digital future. Below are the key thematic attributes of Digital Economic Education derived from the analysis (see Figures 2, 3, 4, and 7).

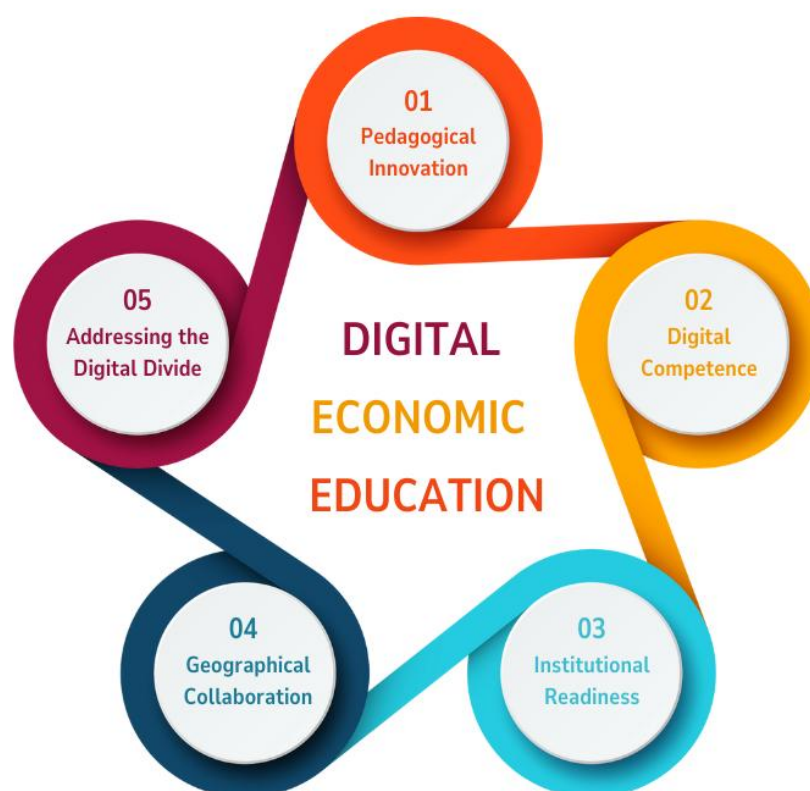


Figure 8. Fundamental Pillars of Digital Economic Education

The successful implementation of Digital Economic Education rests on several interconnected pillars, as illustrated. These include fostering **Pedagogical Innovation**, building essential **Digital Competence**, ensuring strong **Institutional Readiness**, leveraging **Geographical Collaboration**, and proactively **Addressing the Digital Divide**. This framework provides a comprehensive roadmap for educators, policymakers, and institutions to develop a robust and equitable educational ecosystem capable of preparing a future-ready workforce for the complexities of the digital economy. The following sections will explore each of these critical themes in detail.

1. Pedagogical Innovation

The integration of digital technologies such as *Artificial Intelligence (AI)*, *Internet of Things (IoT)*, and *big data* into economics education has transformed teaching and learning practices. These technologies enable interactive, adaptive, and industry-oriented curricula, moving education beyond theoretical concepts toward practical applications. By leveraging simulation tools, learning

analytics, and e-learning platforms, pedagogical innovation fosters more engaging and personalized learning experiences (Haleem et al., 2022).

This innovation not only improves learning outcomes but also equips students with the ability to connect theoretical economics knowledge to the dynamics of the digital economy. As a result, pedagogical innovation serves as a crucial strategy to prepare graduates for the competitive digital labor market. Studies emphasize that the effectiveness of digital economic education depends on how successfully institutions embed technological innovations into the curriculum. (Chansa Chanda et al., 2024; Olatunbosun Bartholomew Joseph et al., 2024; Swaramarinda et al., 2025)

2. Digital Competence

Digital competence has become a fundamental requirement in economics education. It encompasses digital literacy, data analysis, and the ability to use digital platforms effectively. These skills are essential for both students and educators to adapt to the rapid changes of the labor market, where technology increasingly drives economic activities (Dang et al., 2024; Ode et al., 2025)

Beyond technical capabilities, digital competence includes critical thinking, ethical awareness, and collaborative skills in online contexts (Spante et al., 2018). Students must learn to evaluate the credibility of information, engage responsibly in digital environments, and work across disciplines and borders. Strengthening digital competence enhances employability and ensures that graduates are well-prepared for digital economy challenges. (Đorđević et al., 2025).

3. Institutional Readiness

The success of digital economic education heavily relies on institutional readiness. Adequate technological infrastructure, reliable internet connectivity, and integrated digital platforms are essential to support teaching and learning. Institutions with sufficient resources are more capable of embedding technology effectively in their curricula. (Ng et al., 2025)

Institutional readiness also involves strategic leadership, sustainable funding, and continuous faculty development. Universities that foster a culture of adaptability and invest in capacity building are better positioned to embrace digital transformation. Without this readiness, digital initiatives risk becoming fragmented and unsustainable (Carmo et al., 2025).

4. Geographical Collaboration

Geographical collaboration is a driving force in strengthening digital economic education globally. Partnerships between countries such as Malaysia, the UK, the US, and China facilitate joint research, shared curricula, and co-authored publications. Such collaborations enhance academic quality and expand the global reach of digital education. (Porter & Perris, 2023)

In addition, cross-border collaborations promote faculty and student mobility, foster intercultural academic exchange, and allow institutions to adopt best practices. These partnerships accelerate knowledge transfer and position digital economic education as a truly global endeavor (Alieksieieva, 2023; Marlya Tiwow et al., 2023)

5. Bridging the Digital Divide

The digital divide poses a major challenge for the equitable implementation of digital economic education. Disparities in infrastructure, access to technology, and digital skills between developed and developing countries risk deepening educational and socio-economic inequalities (Vesna et al., 2024)

Efforts to bridge this gap require inclusive policies, infrastructure expansion, and digital literacy training for underserved populations. International organizations also play a vital role in supporting access to technology in resource-limited contexts. Bridging the divide ensures that all learners, regardless of geography, can fully participate in the digital economy (Danial et al., n.d.)

CONCLUSION

This study systematically mapped the development of Digital Economic Education through a Systematic Literature Review (SLR) and bibliometric analysis of 61 Scopus indexed publications. The

findings indicate that Digital Economic Education has become an increasingly important and multidisciplinary research area, with a significant growth in publications since 2017, confirming its relevance as a future research agenda. Existing studies are primarily centered on pedagogical innovation, digital competence, institutional readiness, international collaboration, and addressing the digital divide, which together constitute the key pillars for advancing digital economic education. Nevertheless, research remains geographically concentrated in a small number of countries, while developing and low-income regions continue to be underrepresented, highlighting the need for broader global participation and more inclusive knowledge production. Therefore, future research should expand empirical evidence across diverse geographical contexts, investigate the educational implications of emerging technologies such as artificial intelligence and digital platforms, and support policies that strengthen digital competencies, institutional capacity, and equitable access to digital education in order to foster an inclusive and sustainable digital economy.

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