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The Impact of Digital Literacy on the Quality of Economics Education: A Bibliometric Analysis of Teachers and Students in the Digital Era

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Abstract: This study aims to explore the impact of digital literacy on the quality of economics education through a bibliometrikc analysis of publications from 2015 to 2024, focusing on teachers and students in the digital era. Data were sourced from Scopus-indexed journals, identifying key research trends, influential authors, and the most highly cited publications. The analysis reveals a significant upward trajectory in research on digital literacy within economics education, with primary emphasis on e-learning, digital skills, teaching strategies, and socio-economic status. The most cited article is "The effects of ICT-based social media on adolescent students' academic performance," published in the journal Computers and Education. Prominent researchers, such as Hu J. and Yu R., have played pivotal roles in advancing this body of literature. Research trends indicate an integration of digital literacy with modern teaching methodologies and the development of students' digital competencies to enhance economics education outcomes. Despite substantial progress, gaps remain in understanding the long-term implications of digital literacy on educational achievement in economics. This study offers valuable insights for educators, researchers, and policymakers in designing effective digital literacy frameworks within economics education systems.

Keywords: Digital literacy, Economics education, Bibliometric analysis

Introduction

The development of digital technology has brought significant changes to various aspects of life, including the field of education. Digital literacy has now become one of the key competencies that students and educators need to master. Digital literacy not only encompasses the technical skills required to use technological devices but also involves the critical ability to search for, evaluate, and effectively utilize digital information. According to Siddiq et al. (2017), digital literacy serves as the foundation for developing 21st-century skills, such as problem-solving, critical thinking, and collaboration. In the context of economic education, digital literacy plays a vital role in supporting students' understanding of complex economic concepts, including data analysis, market dynamics, and the use of technology in economic processes.

Research indicates that digital literacy can enhance student engagement in learning. Digital technology creates interactive and adaptive learning experiences, enabling students to grasp material in a more engaging way. For instance, Donthu et al. (2021) found that the implementation of e-learning and digital platforms in economic education significantly improved students' learning outcomes. Additionally, Wang et al. (2021) demonstrated that information technology-based social media can help students develop their digital literacy skills, which ultimately positively impacts academic performance. However, the implementation of digital literacy in education is not without challenges. The digital divide in access to technology across various regions, the lack of teacher training in using technology, and socio-economic disparities remain significant barriers that need to be addressed (Claro et al., 2015). Therefore, this research aims to explore the impact of digital literacy on

economic education through a bibliometric approach. By analyzing research trends, the contributions of researchers, and key themes in Scopus-indexed literature, this study seeks to provide new insights into the integration of digital literacy into the economic education system and to identify challenges and opportunities for developing technology-based educational strategies.

Digital literacy is a concept that refers to an individual's ability to use information and communication technology effectively. According to Siddiq et al. (2017), digital literacy not only includes technical skills in using digital devices but also critical abilities to evaluate and utilize information found online. In economic education, digital literacy allows students to access data and information in real-time, understand global economic dynamics, and utilize technology for market analysis. Previous research has shown that digital literacy has a positive impact on education. Donthu et al. (2021) state that the integration of technology in economic learning can enhance student engagement and facilitate more interactive learning. This is supported by Wang et al. (2021), who found that the use of information technology-based social media helps students understand material more deeply through online collaboration and discussion.

However, the digital divide remains a significant challenge. According to Van Dijk (2005), the digital divide encompasses differences in access and individuals' abilities to utilize technology. Claro et al. (2015) also found that students from lower socio-economic backgrounds are more likely to have limited access to technology, which affects their academic achievement. Additionally, research trends show an increased interest in digital literacy in education over the past decade. Chen & Hu (2020) note that topics such as e-learning, digital skills, and media literacy are frequently the focus of research. This reflects a growing awareness of the importance of digital literacy in supporting learning, especially in fields that require data analysis, such as economics. Theories such as digital literacy (Gilster, 1997), constructivism (Vygotsky), and the digital divide (van Dijk, 2005) provide a conceptual framework for understanding the role of digital literacy in education. Through this approach, the research not only highlights the potential of digital literacy in economic education but also emphasizes the need for inclusive strategies to address the challenges posed by the digital divide.

According to Ramdani et al. (2022), researchers worldwide have sought to implement collaborative character education to enhance students' comprehension over the past decade. Consequently, an appropriate analytical approach is required to examine research findings related to the digital literacy of teachers and students in the context of economic education. Various literature review methods can be employed to consolidate existing knowledge and to understand the current state or development of research in this field (Suseelan et al., 2022). One such method is bibliometric analysis, which aims to evaluate research outcomes related to the jigsaw learning model in economic education. Phoong et al. (2022) and Zyoud et al. (2017) describe bibliometric analysis as a technique that can be utilized to assess multiple research findings, both qualitatively and quantitatively, on specific themes. In this context, the researcher seeks to apply bibliometric analysis to illustrate the research landscape of previous studies focusing on the digital literacy of teachers and students in economic education.

This study aims to identify publications related to the digital literacy of teachers and students in economic education and to describe the characteristics of such research. Through bibliometric analysis, the study also seeks to explore the features of publications addressing digital literacy in economic education, identify relevant factors, and analyze research trends in this domain.

Method

This study employs a quantitative research design with a bibliometric approach. The aim of this approach is to analyze scientific publications related to digital literacy for teachers and students in economic education between 2015 and 2024. Bibliometrics is a method used to measure and analyze various aspects of scientific publications, such as the number of publications, collaboration patterns among researchers, and research topic trends. The focus of this study is on scholarly articles published in international journals indexed in the Scopus database. The articles examined in this study are those that address topics related to digital literacy for teachers and students in economic education. Data were collected using the bibliometric software VOSviewer, which enables the visualization of research collaboration networks, keyword analysis, and identification of research trends. Data collection involved downloading metadata of publications from the Scopus database, which includes information such as article titles, authors, affiliations, abstracts, keywords, and references.

There are several steps in refining the collected data, as presented in Diagram 1. The first step is identification, followed by screening, feasibility assessment, and finally the inclusion step (Moher et al., 2009). The first

process is identification, where the researcher inputs keyword terms into the database search. The keywords used were ("digital") AND ("literacy") AND ("economic") AND ("education"). This identification process yielded 595 publication records. The next step is screening. The researcher filters publications based on criteria, meaning the publication must be in English and an article published in a journal. After screening, 488 publications met the criteria, meaning 107 publications were excluded and not considered for further processing. The researcher then conducted another screening based on subject areas, resulting in 293 articles, meaning 195 publications were excluded and not carried forward to the next stage.

Next, the screening results were published as part of an effort to ensure the feasibility of the process. In this step, the researcher manually reviewed the publications to assess their suitability for inclusion. The researcher examined the abstracts and titles of the 293 publications and assessed those that discussed digital literacy for teachers and students in economic education. At the end of this third stage, 76 publications were deemed suitable for inclusion in the next phase. This data was retrieved on December 11, 2024, during the inclusion stage. The trend of publications related to digital literacy for teachers and students in economic education was analyzed using descriptive analysis from the database dimensions with bibliometric analysis. The number of publications and the linear trend of publications each year will be presented in a graph using Microsoft Excel software.

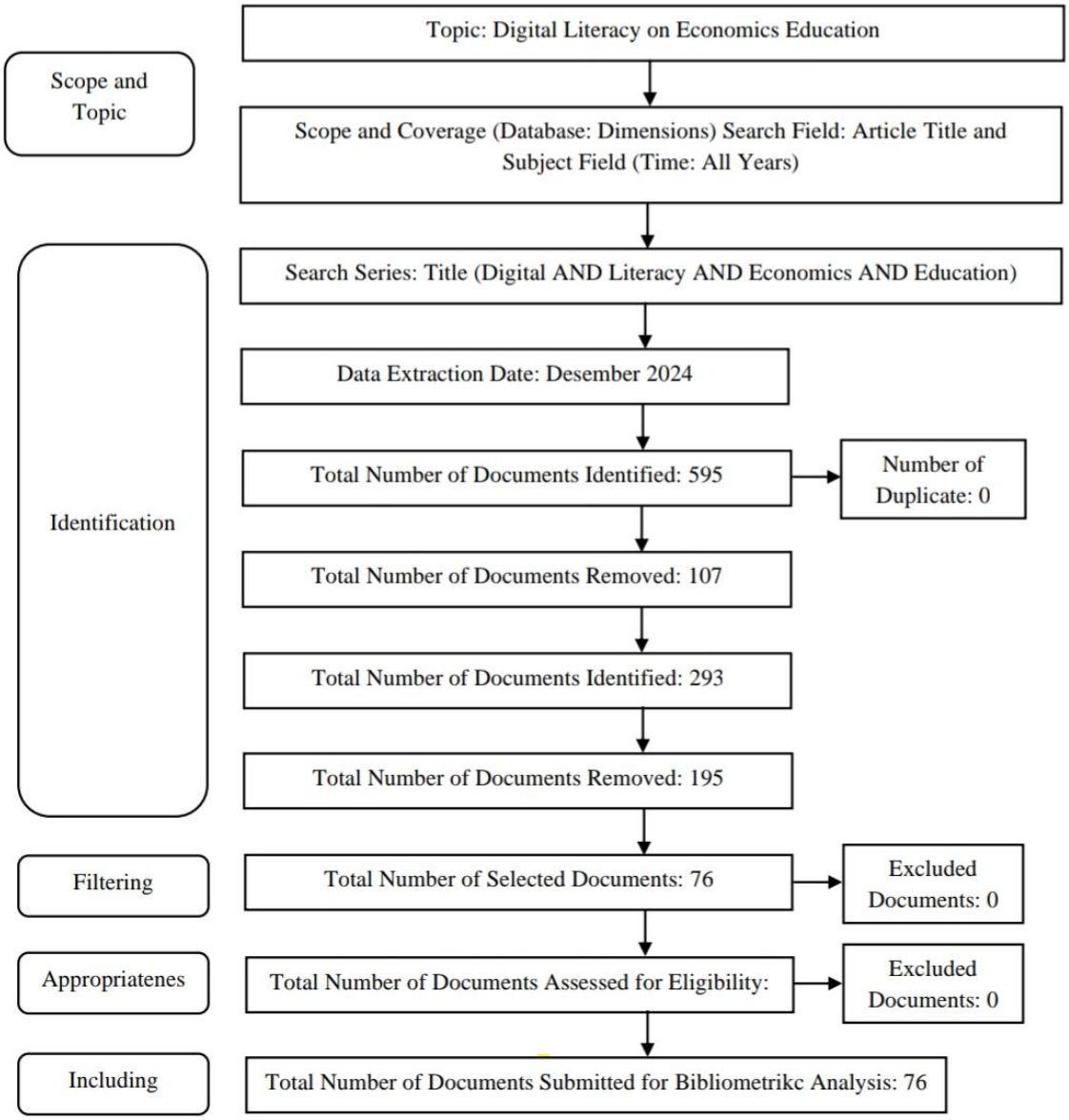

Figure 1. Series of data collection processes

This study employs bibliometric visualization and analysis methods to evaluate research trends and the main characteristics of various publications. Bibliometric analysis is a quantitative approach aimed at evaluating and

describing trends within a research field. Bibliometric visualization methods provide a structural overview of a specific research area (Wang et al., 2021). Bibliometric analysis techniques are divided into two main categories: performance analysis and mapping (Donthu et al., 2021). In the performance analysis, the researcher evaluates the number of publications per year, the most cited documents, the institutions with the most citations, and the journals with the most citations. Additionally, the researcher examines the use of keywords by authors. Mapping or identification is carried out through Network Visualization, Overlay Visualization, and Density Visualization. The research focus on digital literacy for teachers and students in economic education is analyzed using the VOSviewer application, which is used to assess the emergence of keywords. The researcher sets a minimum threshold of two publications using the same keyword to display the research focus.

Results and Discussion

In presenting the results of the bibliometric analysis, this study refers to Donthu et al. (2021) and Ellili (2022). The analysis begins by identifying the number of documents and citations from various countries, institutions, journals, authors, and the emergence of related keywords. The focus of this study is on the countries relevant to the keywords used. The researcher starts by evaluating the number of citations and publications from institutions or universities, as well as related documents. The results of the keyword co-occurrence analysis are then visualized using VOSviewer through methods such as Network Visualization and Overlay Visualization.

Trends in Number of Publications

A total of 76 publications related to digital literacy for teachers and students in economic education were collected, covering the period from 2015 to 2024 and meeting the established research criteria. This data was then analyzed descriptively using bibliometric methods. Publication trends, citation trends, distribution by country and journal, as well as research focus, will be discussed in detail.

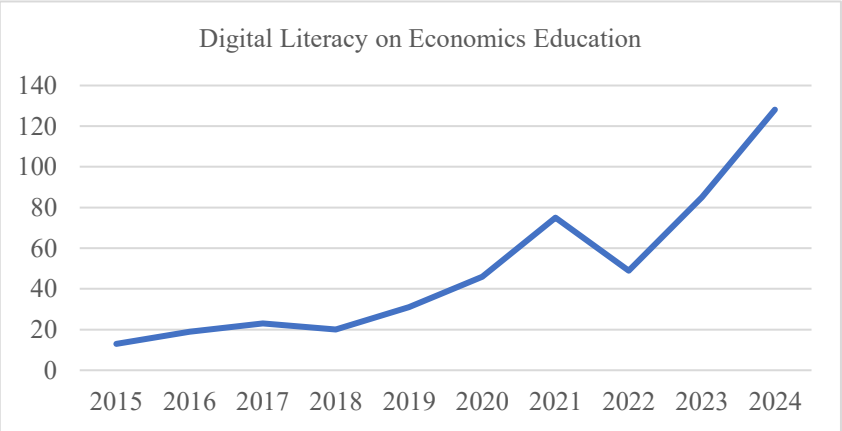

Figure 2. Number of publications on digital literacy for teachers and students in economic education in the last 10 years

From 2015 to 2024, the number of documents produced shows fluctuations with a significant upward trend in recent years. In 2015, there were only 13 documents (2.66% of the total), followed by a slight increase in the subsequent years, reaching 46 documents in 2020 (9.41%). A sharp rise occurred in 2021, with the number of documents reaching 75 (15.34%), marking the beginning of a consistent growth trend. Despite a slight decline in 2022, with 49 documents (10.02%), the number surged again in 2023 and 2024, reaching 85 documents (17.38%) and peaking at 128 documents (26.18%), respectively. From this analysis, it is evident that the largest contribution to the total number of documents comes from 2024, which accounts for more than a quarter of the total documents (26.18%). The recent upward trend suggests the possibility of factors such as increased research productivity, improved access to research resources, or a greater push for publications within the academic community. However, the decline in 2022 warrants attention to understand whether it was caused by external factors, such as technical constraints, policy changes, or shifts in research priorities. Overall, this data reflects positive growth in the number of publications over the last decade.

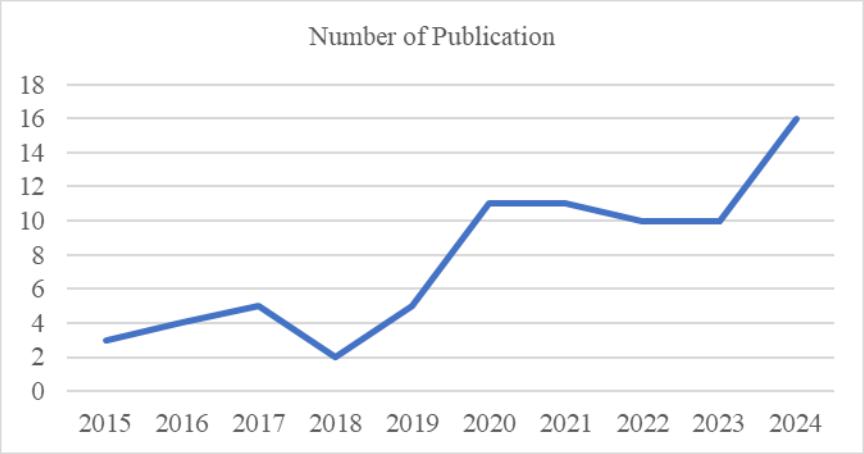

Figure 3. Number of selected publications on digital literacy for teachers and students in economic education

Based on the publication data from 2015 to 2024, there is a significant upward trend, particularly in the past few years. In 2015, the number of publications reached only 13 documents (2.66% of the total), which gradually increased to 19 documents (3.89%) in 2016 and 23 documents (4.70%) in 2017. However, there was a slight decline in 2018 with only 20 documents (4.09%). In 2019, a moderate increase was recorded with 31 documents (6.34%), followed by a significant surge in 2020, reaching 46 documents (9.41%). The largest increase occurred starting in 2021 with 75 documents (15.34%), followed by a small fluctuation in 2022 with 49 documents (10.02%). The growth trend continued, reaching 85 documents (17.38%) in 2023, peaking in 2024 with 128 documents (26.18%). This distribution shows that more than a quarter of the total publications during this decade came from 2024. This sharp increase may reflect greater efforts in research activities, increased support for scholarly publications, or institutional policy incentives. The early period (2015–2018) was marked by slower growth, while the years following showed significant acceleration in the number of publications.

Publication Trends by Document Type

The number of documents can be determined based on the type of document from various written sources. Publications on Digital Literacy for Teachers and Students in Economic Education from 2015 to 2024 are listed in the following table.

Table 1. Number and percentage of publications on digital literacy for teachers and students in economic education from 2015–2024 by document type

No	Documen Type	Number of Publication	Percentage
1	Article	56	73,68%
2	Conference Paper	12	15,78%
3	Book Chapter	8	10,52%
Total		76	100%

Based on the table above, out of the total 76 publications, the most dominant document type is the article, with 56 documents, accounting for 73.68% of the total publications. This document type serves as the primary format for disseminating research findings. Conference papers rank second, with 12 documents, or 15.78%, reflecting a significant contribution from discussions or presentations of research results at academic forums. Following that, book chapters account for 8 documents, or 10.52%, highlighting contributions to academic book publications. This distribution indicates that articles are the most frequently used publication format, followed by contributions to conferences and book chapters.

Institute Bibliography Partner

Indexed documents related to Digital Literacy for Teachers and Students in Economic Education are published by various institutions or universities. The institutions or universities with the highest number of publications, along with citation counts, are presented in the table below.

Table 2. Number and percentage of publications on digital literacy for teachers and students in economic education from 2015–2024 by publisher

No	Publisher	Number of Publications	Number of Citations
1	Computer and Education	6	331
2	Eurasia Jurnal of Mathematics Science and Technology Education	3	28
3	Cultura Y Education	2	98
4	IEEE Global Engineering Education Conference Educon	2	2
5	Social Indicator Research	2	0

The data in Table 2 shows the journal trends with the highest number of documents. Computer and Education is the publisher with the most publications, totaling 6, and has a significantly high citation count of 331. This indicates that publications in this journal have a substantial impact and are frequently referenced by other researchers, reflecting the quality and relevance of the research published there. Next, Eurasia Journal of Mathematics Science and Technology Education, with 3 publications and 28 citations, suggests that although the number of publications is smaller, the research published there is still quite respected. Cultura Y Education and IEEE Global Engineering Education Conference Educon, each with 2 publications, show a more varied citation count, with Cultura Y Education receiving 98 citations, indicating a greater influence compared to IEEE Global Engineering Education Conference Educon, which has only 2 citations. Finally, Social Indicator Research, also with 2 publications, has no citations, which may suggest that although there are publications, the research in this journal has yet to gain adequate attention or relevance.

Table 3. Publications with the highest citation count on digital literacy for teachers and students in economic education from 2015–2024

No	Writer's Name	Tittle	Year	Number of Citations
1	Siddiq Gochyyev and Wilson	Learning In Digital Networks – ICT Literacy: A Novel Assessment of Students' 21st Century Skills	2017	116
2	Hu and Yu	The Effects of ICT-Based Social Media on Adolescents' Digital Reading Performance: A Longitudinal Study of PISA 2009, PISA 2012, PISA 2015 And PISA 2018	2021	63
3	Tran, Ho, Pham, La and Vuong	How Digital Natives Learn and Thrive in The Digital Age: Evidence from an Emerging Economy	2020	63
4	Buckingham	Teaching Media in A 'Post-Truth' Age: Fake News, Media Bias and The Challenge For Media/Digital Literacy Education | La Enseñanza Mediática En La Era De La Posverdad: Fake News, Sesgo Mediático Y El Reto Para La Educación En Materia De Alfabetización Mediática Y Digital	2019	63
5	Nichols and Stornaiuolo	Assembling ″Digital Literacies: Contingent Pasts, Possible Futures	2019	61
6	Sá and Serpa	COVID-19 And The Promotion Of Digital Competences In Education	2020	52
7	Lazonder, Walraven, Gijlers and Janssen,	Longitudinal Assessment Of Digital Literacy In Children: Findings From A Large Dutch Single-School Study	2020	51
8	Reddy, Sharma and Chaudhary	Digital Literacy: A Review in the South Pacific	2022	49
9	Claro, Cabello, San Martín and Nussbaum,	Comparing Marginal Effects of Chilean Students' Economic, Social and Cultural Status on Digital Versus Reading and Mathematics Performance	2015	43
10	Chen and Hu	ICT-Related Behavioral Factors Mediate the Relationship Between Adolescents' ICT Interest and Their ICT Self-Efficacy: Evidence from 30 Countries	2020	42

Based on Table 3, the publication titled *Learning In Digital Networks – ICT Literacy: A Novel Assessment Of Students' 21st Century Skills* holds the top position, authored by Siddiq, F., Gochyyev, P., and Wilson, M. (2017), with 116 citations. In second place, there are three publications with the same number of citations: *The Effects Of ICT-Based Social Media On Adolescents' Digital Reading Performance: A Longitudinal Study Of PISA 2009, PISA 2012, PISA 2015 And PISA 2018* by Hu and Yu (2021), *How Digital Natives Learn And Thrive In The Digital Age: Evidence From An Emerging Economy* by Tran et al. (2020), and *Teaching Media In A 'Post-Truth' Age: Fake News, Media Bias And The Challenge For Media/Digital Literacy Education* by Buckingham (2019), each with 63 citations. The fifth position is occupied by the publication *Assembling Digital Literacies: Contingent Pasts, Possible Futures* written by Nichols, T.P. and Stornaiuolo, A. (2019) with 61 citations. In sixth place, the publication *COVID-19 And The Promotion Of Digital Competences In Education* by Sá et al. (2020) garnered 52 citations. The seventh position is held by *Longitudinal Assessment Of Digital Literacy In Children: Findings From A Large Dutch Single-School Study* by Lazonder et al. 2020) with 51 citations. *The publication Digital Literacy: A Review In The South Pacific* by Reddy et al. (2022) ranks eighth with 49 citations. In ninth place is *Comparing Marginal Effects Of Chilean Students' Economic, Social And Cultural Status On Digital Versus Reading And Mathematics Performance* by Claro et al. (2015) with 43 citations. Finally, in tenth place, the publication *ICT-Related Behavioral Factors Mediate The Relationship Between Adolescents' ICT Interest And Their ICT Self-Efficacy: Evidence From 30 Countries* by Chen and Hu (2020) achieved 42 citations.

Research Trends in Digital Literacy for Teachers and Students in Economic Education

The data obtained from the Scopus database were downloaded in RIS format and then imported into VOSviewer software for bibliometric analysis. The researcher set a threshold for the use of co-occurring keywords, specifically requiring that at least two documents use the same keyword. Only documents that met this threshold were analyzed to display keywords frequently used together by at least two different documents. The researcher selected the most frequently occurring keywords that were relevant to the topic of Digital Literacy for Teachers and Students in Economic Education. The frequency of these keywords reflects research trends related to the topic, as shown in Figure 2 below.

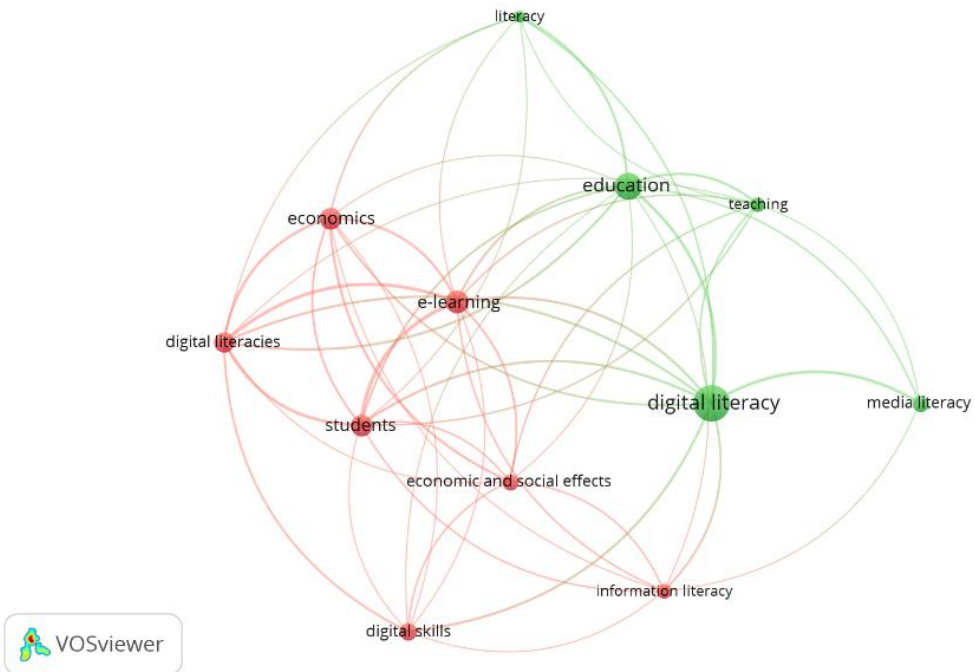

Figure 4. Network visualization of co-occurring keywords

The figure displays the network visualization of co-occurring keywords (with a minimum of two). The keyword "digital literacy" appears most frequently, with 42 co-occurrences, as reflected in the size of the circle representing this keyword. The larger the circle, the more often the keyword is used by researchers in the context of Digital Literacy for Teachers and Students in Economic Education. Further details regarding the co-occurrence of keywords can be found in Table 4.

Table 4. Most frequently occurring keywords related to digital literacy in economics education

No	Keywords	*Cooccurence*
1	Digital Literacy	42
2	Education	23
3	E-Learning	16
4	Students	15
5	Economics	15
6	Digital Literacies	13
7	Digital Skills	10
8	Economic and Social Effects	8
9	Media Literacy	8
10	Teaching	7
11	Information Literacy	5

Based on the analysis of the most frequently occurring keywords in research related to Digital Literacy for Teachers and Students in Economic Education, it is evident that *digital literacy* is the primary focus with the highest frequency, appearing 42 times. This indicates that digital literacy plays a significant role in the context of economic education. The keyword *education* (23) ranks second, emphasizing that this research is closely related to the field of education. Furthermore, *e-learning* (16), *students* (15), and *economics* (15) highlight the connection between digital learning methods, the role of students, and its relevance in economic studies. Additionally, keywords such as *digital literacies* (13) and *digital skills* (10) underscore the importance of specific digital skills in supporting digital literacy. Topics related to *economic and social effects* and *media literacy* each appear 8 times, indicating that this research also considers the broader impacts of digital literacy implementation. Meanwhile, the keywords *teaching* and *information literacy* have lower frequencies, each appearing 7 and 5 times, respectively. Overall, this trend reflects significant developments in research related to digital literacy in the field of economic education.

The results of the network visualization in Figure 2 indicate the presence of 2 clusters with 12 items related to Digital Literacy for Teachers and Students in Economic Education, namely: Cluster 1 (green) consists of 7 items (*digital literacies, digital skills, e-learning, economic and social effects, economics, information literacy, students*). Cluster 2 (red) consists of 5 items (*digital literacy, education, literacy, media literacy, teaching*). This visualization illustrates the relationships and interconnections between items within each cluster, providing a comprehensive overview of the research focus related to Digital Literacy for Teachers and Students in Economic Education.

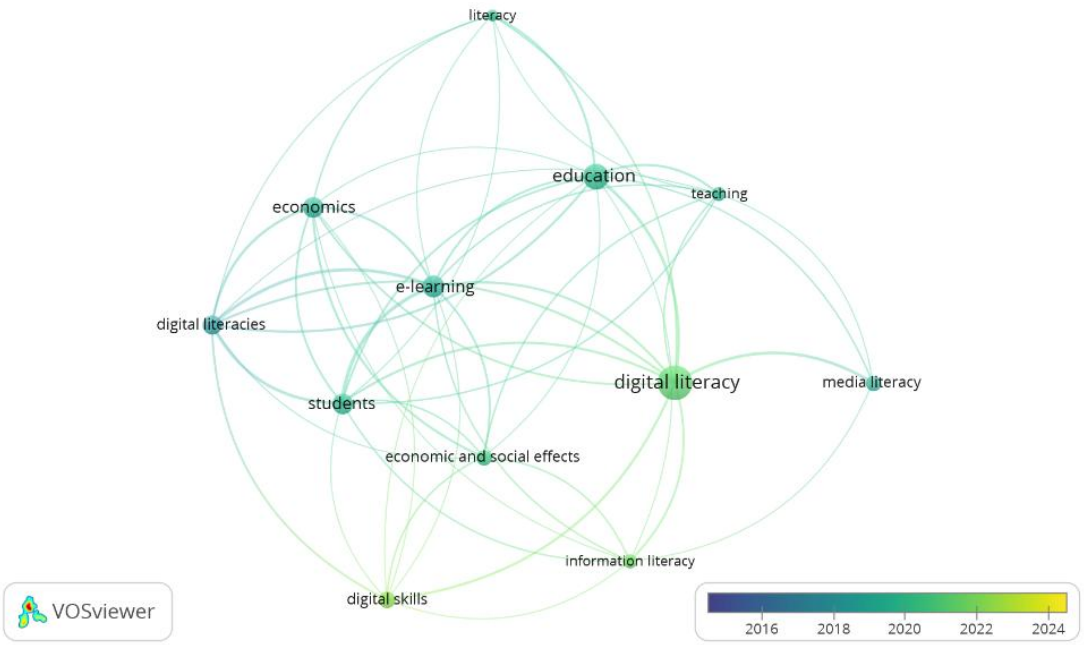

Figure 5. Overlay visualization of co-occurring keywords based on publication year

Based on the overlay visualization displayed through VOSviewer, research trends related to Digital Literacy for Teachers and Students in Economic Education show an interesting development from 2016 to 2024. The overlay color represents a chronological distribution, with dark blue representing topics that were widely discussed at the beginning of the period, while green-yellow indicates more recent research focuses. The keyword "digital literacy" appears as the central research topic with many connections to other terms, highlighting its position as the primary focus of this research. Keywords such as education, e-learning, economics, and students also have strong interconnections, reflecting the importance of educational and technological aspects in enhancing digital literacy among teachers and students. Recent research trends are visible through keywords like digital skills, economic and social effects, and information literacy, which tend to be green-yellow, indicating an increased focus on these topics in recent years.

On the other hand, keywords like teaching and media literacy remain relevant but with a more stable growth rate. Furthermore, e-learning appears to play a crucial role as a connector between various topics, especially with education, students, and digital literacy, emphasizing that digital learning technology plays a key role in digital literacy in economic education. Overall, early research tended to focus on conceptual aspects such as digital literacy and education, while more recent research has shifted toward practical aspects and real-world impacts, as reflected in the focus on digital skills and economic and social effects. This visualization shows that research trends in the field of digital literacy in economic education continue to evolve and diversify, addressing challenges and opportunities in the digital era. This shift is also evident in the distribution of countries most engaged in implementing Digital Literacy for Teachers and Students in Economic Education, as shown in the following table.

Table 5. Distribution of countries with the most publications on digital literacy for teachers and students in economic education from 2015 to 2024

Country	Document	Citations
United Kingdom	9	145
Russian Federation	8	32
United States	8	210
Spain	5	16
Australia	5	126
China	5	126
India	5	43
Belgium	4	106
Portugal	4	96

The Table 5 shows the highest distribution of countries related to publications on Digital Literacy for Teachers and Students in Economic Education. The United States, the country with the highest number of citations, has 8 documents with 210 citations. This indicates that publications from this country have a significant influence in the academic community, with high-impact research and relevance to the topics discussed. The United Kingdom also performs well with 9 documents and 145 citations. Although the citation count is slightly lower than that of the United States, it still demonstrates a considerable influence.

China and Australia, with 5 documents and 126 citations each, show that both countries have made significant contributions to the field, even though their citation counts are lower than those of the US and UK. This may be due to a more evenly distributed citation rate or factors such as differences in research focus. The Russian Federation, despite having 8 documents, only received 32 citations, indicating that while there are publications, their impact or relevance among international researchers may be limited. Countries like Spain, India, Portugal, and Belgium also have fewer documents with more varied citation counts, suggesting that while publications exist, their international influence is smaller.

From the discussion above, research or the number of publications related to Digital Literacy for Teachers and Students in Economic Education shows a steady and generally increasing trend year after year. The most documents are found in *Computer and Education*, totaling 6 documents. The highest number of citations is found in the study by Siddiq, F. et al. (2017) titled *Learning In Digital Networks – ICT Literacy: A Novel Assessment Of Students' 21st Century Skills*, which has 116 citations. The most frequently used keyword is "digital literacy," with 42 items. Based on the visualized keywords, several trends emerge. Research focusing on Digital Literacy for Teachers and Students in Economic Education includes keywords such as digital literacy, education, e-learning, students, economics, digital literacies, digital skills, economic and social effects, media literacy, teaching, and information literacy.

Conclusion

The results of this study indicate that the publication trend in Dimensions-indexed journals related to digital literacy for teachers and students in economics education has shown a consistent annual increase. The highest number of documents is found in Computer and Education with a total of six documents. Additionally, the study with the highest number of citations is by Siddiq, F., Gochyyev, P., and Wilson, M. (2017), titled Learning in Digital Networks – ICT Literacy: A Novel Assessment of Students' 21st Century Skills with a total of 116 citations. The keyword education is the most frequently used in relation to digital literacy appearing in 23 instances. Based on the visualized keywords, several trends have emerged. Research on digital literacy for teachers and students in economics education primarily focuses on keywords such as digital literacy, education, e-learning, students, economics, digital skills, economic and social effects, media literacy, teaching, and information literacy. This information can serve as a foundation for further research on digital literacy among teachers and students in economics education. To expand the range of keywords in research topics and for further data collection, it is recommended to use databases beyond Dimensions, such as Scopus or Web of Science (WoS).

Recommendations

Based on the findings of this study, several avenues for future research can be identified. First, further exploration of the digital divide between urban and rural areas could provide a deeper understanding of the factors influencing digital literacy among students and educators in economics. Such studies could also help identify effective strategies for bridging technological access disparities. Second, longitudinal research focusing on the long-term impact of digital literacy on understanding complex economic concepts could yield valuable insights into the efficacy of integrating technology into economics education. Third, international comparative studies could be instrumental in uncovering how digital literacy approaches are implemented across various countries while identifying best practices that can be adapted. Furthermore, the development and evaluation of advanced technologies, such as artificial intelligence and virtual reality, in supporting digital-based economics education present a promising area for investigation. Finally, emphasizing the formulation of inclusive educational policies and technology training for educators is crucial for reinforcing the integration of digital literacy within the broader framework of economics education.

Scientific Ethics Declaration

* The authors declare that the scientific ethical and legal responsibility of this article published in EPESS journal belongs to the authors.

Conflict of Interest

* The authors declare that they have no conflicts of interest

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