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# Technology Integration in Education Management: A Systematic Review of Scopus-Indexed Studies (2020–2024)

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**ABSTRACT**

The rapid integration of digital technologies has significantly transformed educational management practices. However, the specific roles and functions of technology across different educational levels remain insufficiently synthesized. This study aims to review technology integration in educational management and examine its functional roles in supporting learning and institutional objectives. A systematic literature review was conducted following the PRISMA framework. Data were retrieved from the Scopus database, covering publications from 2020 to 2024. Bibliometric and thematic analyses were performed using VOSviewer to identify trends, patterns, and focal areas of technology use in educational management. The findings indicate that technology in educational management is predominantly applied to support learning processes, particularly through assessment systems and technology-enhanced instructional strategies that improve student comprehension. However, the review also reveals notable differences between schools and universities in their technological objectives, reflecting diverse institutional priorities and levels of implementation. The study highlights that technology fulfills multiple and context-dependent functions within educational institutions. Consequently, curriculum development and educational policy design should not be generalized across educational levels, especially concerning the adoption of artificial intelligence technologies. Tailored strategies are essential to align technological integration with institutional goals.



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## 1. INTRODUCTION

Educational management studies in recent years have been promoted by looking at several categories of educational management from several perspectives. Educational management has been promoted by looking at leadership capabilities in driving educational development (Puican Rodriguez et

al., 2023) through innovation in sustainable educational development (Mullakhmetov et al., 2019). Pant & Baroudi (2008) argue that educational management emphasizes the promotion of human soft skills to advance education. In addition, the educational management model also focuses on how educational management uses technology in learning activities (Martins et al., 2019). Therefore, innovation management is needed to integrate technology in education and educational management (Hou et al., 2021).

This concept is too broad to be reviewed in depth. The idea of educational management itself has been examined in several studies, from diverse perspectives, such as that of educational management through leaders who encourage innovation through technology (Sauphayana, 2021). The use of technology must be based on the context in which the case is being studied (Lai & Bower, 2019). This study can be grouped into several topics, including the educational process through educational management (Connolly et al., 2019), the development of educational management, and the promotion of learning activities with an emphasis on skill development (Punsrigate Khonjaroen & Srikoon, 2021). Therefore, the study of educational management has a broad scope, thus creating challenges in encouraging educational management with more effective learning models (Fan et al., 2024).

Therefore, Bonfield et al., (2020) reviewed the need for advancements in the application of technology in educational settings at both the school and university levels, advocating the establishment of smart classrooms. Bonfield et al. (2020) describe this approach as aiming to establish sustainable management of digital transformation in educational activities. Moreover, the digitalization of the education system has altered the approach to teaching, prompting Xiao (2019) to refer to it as the digital transformation of education. This topic has gained prominence due to the digital transformation, necessitating a reconsideration of its role in educational management. Consistent with this perspective, Flori & Raulea, (2025) evaluated the need for educational institutions to reassess the use of technology in educational management. This study was undertaken to address recommendations from recent years regarding the application of technology in educational management.

Several researchers have analyzed educational management from several perspectives to show the breadth of the concept of academic management, such as optimal utilization of resources to achieve goals (Pd Purwadhi, 2019), robust leadership, fiscal transparency, and constructive connections within the school (Basri et al., 2024), establishing a quality management system and fostering continuous improvement (Nadezda et al., 2024), sufficient facilities and incorporation of technology (Basri et al., 2024; Pd Purwadhi, 2019), adopting innovation and inclusion in educational methodologies (Nadezda et al., 2024), continuous professional development for educators (Punsrigate Khonjaroen & Srikoon, 2021), promoting active engagement and autonomous learning (Dimitrios et al., 2025), or systematic evaluation of pedagogical efficacy and student achievement metrics (Qi, 2022). Several recent studies have shown that the concept of educational management is enormous, so this study proposes how technology functions in education management. Nevertheless, we continue to observe the role of technology in education and the results of using AI in education management. This inquiry is crucial in understanding the function of technology in education. Based on prior studies, we identified research gaps that warrant attention, particularly regarding the use of technology in educational administration. Much research has insufficiently defined the role of technology and failed to examine its function in educational management. Consequently, our research seeks to address this weakness, which has not previously been recognised as a critical gap in scholarly inquiry.

Efficient technology management significantly impacts the incorporation of technology into educational institutions. This encompasses enhancements in infrastructure and training, which are essential for effective technology adoption (Larosiliere et al., 2013, 2016). Training and infrastructure partially mediate the interaction between technology management and technology integration, underscoring their significance in the process (Larosiliere et al., 2016). Enhanced Educational Processes: The utilization of Learning Management Systems (LMS) has gained prominence, enabling remote instruction and augmenting student involvement and academic achievement (Furqon et al., 2023); technology provides platforms to optimize administrative functions, facilitate online learning

requirements, and enhance the overall educational experience (Madyatmadja, 2023). Technologies such as artificial intelligence (AI), blockchain, and the metaverse are revolutionizing educational and managerial processes, resulting in substantial changes in the delivery and management of education (Madyatmadja, 2023). Technology serves a broader function, one of which is in the realm of educational management. Consequently, a study is required to examine the role of technology across various research areas; this paper therefore evaluates previously unreported findings on the application of technology in educational management.

AI-driven platforms enhance the effectiveness of educational resources and elevate student satisfaction (Huang, 2024; Wu et al., 2010), underscoring AI's capacity to revolutionize educational management (Tong et al., 2024). Integrating conventional in-person instruction with online elements has garnered interest for its capacity to improve student engagement and educational outcomes (Edwar, 2025). This method provides adaptability and accessibility, enabling students to engage with course material and collaborate with colleagues in novel ways (Edwar, 2025). Nevertheless, Restricted ICT Resources and Connectivity: Numerous regions experience a scarcity of ICT resources, inadequate internet connectivity, and inconsistent power supply, which impede the successful incorporation of technology (Ghavifekr et al., 2017; Moser, 2007), some factors including the substantial expenses associated with technology and internet access, often overshadow the demonstrable benefits when determining the implementation of technology in education (Ghavifekr et al., 2017).

Guidance and Organization: Engaging faculty presents a notable challenge, particularly among those in the 'second wave' who may be reluctant to adopt new technologies. Effective leadership is crucial for inspiring faculty and harmonizing various support units, including educational technology centers, IT assistance, and teaching laboratories (Moser, 2007). Adaptive Leadership: It is essential to implement adaptive leadership to effectively navigate the swift changes and technological progress in the field of education. Successful educational management requires implementing creative strategies to foster a sustainable learning environment (Moser, 2007). Inadequate expertise: Educators and personnel often lack the requisite knowledge to use technology in their instructional methodologies professionally. Ongoing professional development and training are essential to equip educators with the competencies needed for technology integration. Specialized training in special education is necessary to customize technology to the unique needs of students with disabilities. It encompasses comprehending how emergent technologies can assist these pupils. Therefore, the research proposes a more specific study to analyze how technology integration in educational management. To find out the trend, this study answers several questions.

RQ1. What trends and technologies dominate educational management literature from 2020–2024?

RQ2. What educational outcomes are associated with AI and IoT integration in different educational contexts?

## 2. METHODS

The systematic review used in this research is the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Page et al., 2021), which clarifies the rigour of several studies considered finalized for further inquiry. The study predominantly utilized bibliometric analysis, as outlined by, to fulfill the research objectives and inquiries. This methodology was deemed appropriate for delineating the concepts and themes in the research (Daudt et al., 2013). Moreover, the systematic review function in a review article enables the study and mapping of various concepts using specified research approaches; this approach catalogs the volume of diverse publications on similar or separate issues. This review uses VOSviewer as a scoping tool to synthesize empirical data on natural disaster response in Indonesia within a uniform domain. This research finds the systematic review more suitable for analyzing the study's concepts, as it effectively categorizes them by research phase. VOSviewer serves as an analytical tool for identifying publications, key research areas, and significant developments in the field of theoretical history (Chen, 2017). This article employed the Scopus database to investigate the integration of

technology in education management. The Scopus database is the primary data source for this meta-analysis. This search strategy is a research methodology for selecting articles from broader topics and achieving greater conciseness. This article outlines many VOSviewer analytic components as per the usage guide, including burst terms, cluster view, color map, citations, and cluster view (Chen, 2017).

More detail form the PRISMA model we use the research strategis with the Scopus database identified 762 publications using the specified keywords: TITLE-ABS KEY ( integrating AND technology AND into AND education AND management ) AND PUBYEAR > 2020 AND PUBYEAR < 2024 AND PUBYEAR < 2025 AND ( LIMIT-TO ( DOCTYPE , "ar" ) AND ( LIMIT-TO ( LANGUAGE , "English" ) AND ( LIMIT-TO ( SUBJAREA , "SOCI" ) AND ( LIMIT-TO ( EXACT KEYWORD , "Higher Education" ) OR LIMIT-OR-EXCLUDE ( EXACTSRCTITLE , "JOURNALS" ) AND ( LIMIT-TO ( PUBSTAGE , "final" )

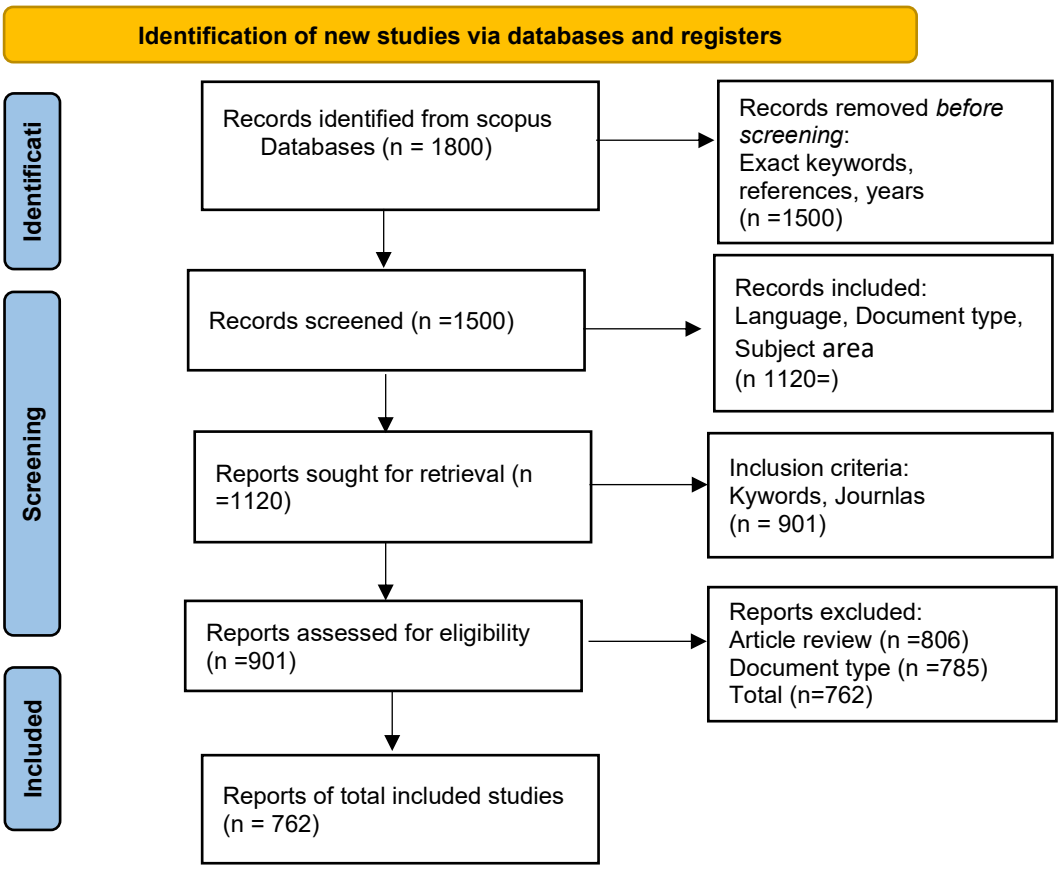


**Figure 1.** PRISMA flow diagram

## 3. FINDINGS AND DISCUSSION

### *3.1. Trend Publication of Education Management*

Instruction in technological applications, including AI, enhances the efficiency with which educators and learners utilize teaching resources and materials (Ding et al., 2024). This posits that educators ought to employ technology to engage students and that the technological revolution substantially influences institutions and schools, enhancing educational affordability and promoting student comprehension. The findings classify many factors that encourage the utilization of technology in educational management. Figure 1 shows publication trends in the last five years, showing progress toward the function of technology. Several previous studies have shown that factors such as COVID-19 are early markers of the technological revolution in education and teaching. The results of the review

of the topic show that in 2020, the number of documents published that year was a total of 81 and citations 82; in 2021, 75 citations 370; in 2022, 105 with citations of 819; in 2023, 246 documents with citations 1418, and in 2024, the number of publications increased significantly to 355 with citations 3172. So, in the last five years, the research topic on technology integration in education totaled 762 documents.

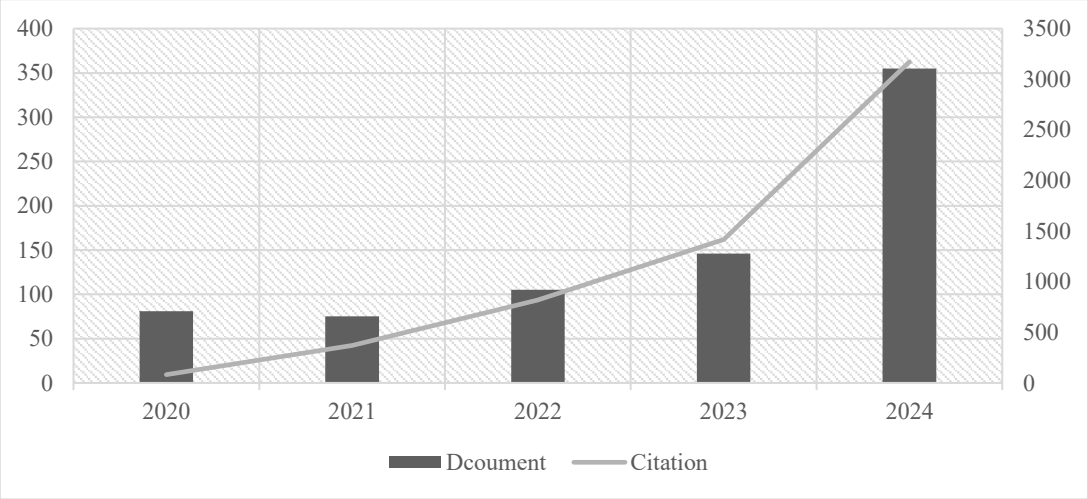


**Figure 2.** Publication by document and citation

As shown in Figure 2, the number of publications on technology integration in education has increased substantially over the past five years. This growing trend reflects the prominence of technology-related issues in educational management research. Several factors contribute to this dominance, including shifts in perspectives on educational development influenced by political dynamics and social conditions (Xiao, 2019), as well as the increasing demand for graduates with adaptive and flexible competencies (McCarthy et al., 2023). Furthermore, the rapid technological revolution and evolving perceptions of technology have driven continuous improvements in educational practices, enabling institutions to implement technology on a large scale. The outbreak of the COVID-19 pandemic in 2020 further accelerated this transformation, prompting widespread adoption of digital technologies to sustain educational activities during periods of disruption (Aidoo et al., 2022; Chick et al., 2020). Overall, the growing body of research on technology integration highlights the diverse educational strategies and policy responses adopted by different countries.

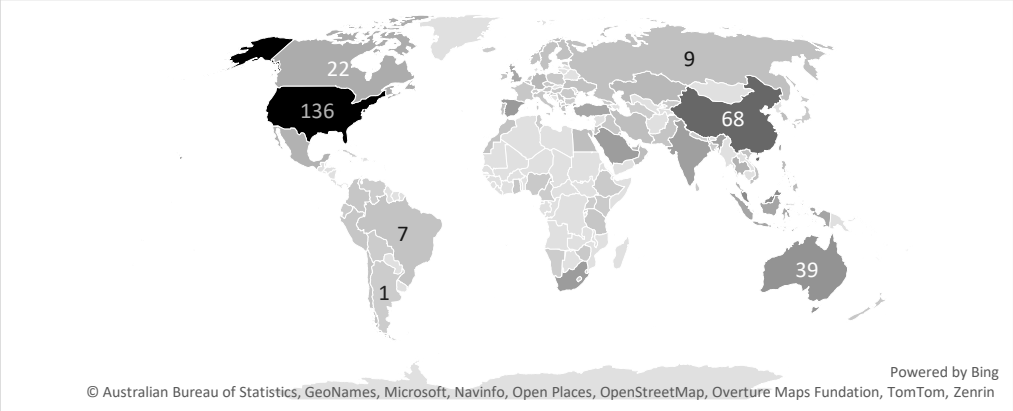


**Figure 3.** Publications by country

Countries with high technology index are generally more established in using technology in education management. See Figure 3 United States, the country with the most publications in the last

five years, 136 documents. China is a country with maturity in education management by promoting the function of technology, even in some of the most recent topics, such as the use of ChatGPT (Gao et al., 2024); at the educational level, the function of technology is used in every school and university (Han et al., 2023). Australia, for example, promotes technology in education at universities by integrating technology into students' career development (McKenzie et al., 2021), while Canada is the third country with the highest number of documents, with 22 papers; for example, the use of AI ChatGPT in education and continuing teaching (Alshahrani, 2023), in line with the research of Gao et al (2024), but in other functions technology encourages education to grow through culture and linguistic education. (Le Pichon et al., 2024) or measuring students' ability to pursue higher education through e-assessment applications (Sankoh et al., 2023). The findings of this study align with the Our World in Data report on the Human Development Index, which classifies countries such as the United States, China, Australia, Canada, Germany, Sweden, Japan, and Russia with a ranking of 0.9-1. This indicates that the results correspond with the human development index in nations with a substantial volume of publications, as illustrated in Figure 3.

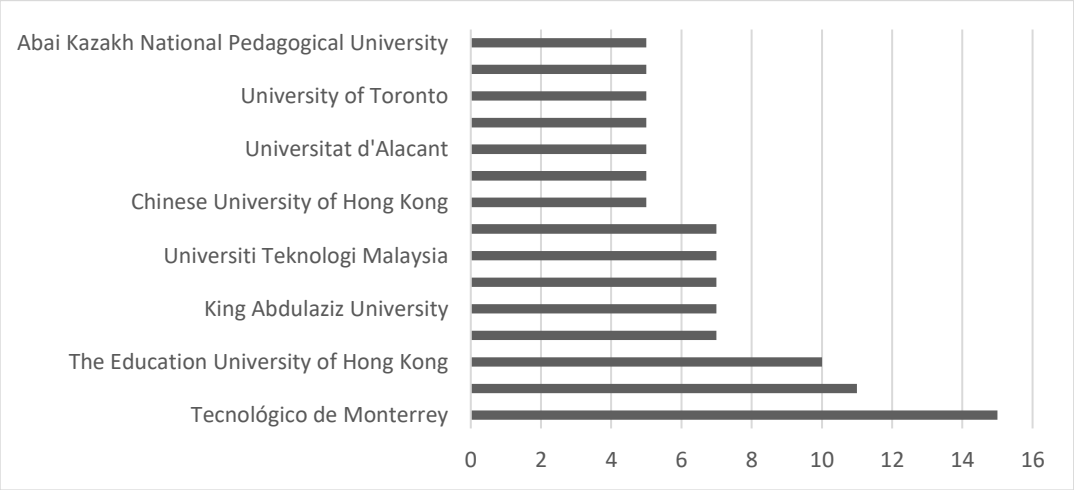


**Figure 4.** Publication by affiliation

To clarify the position of this article, the systematic review in this study selects the subject area of social science, indicating that this paper reviews educational management studies. Studies on integrating technology into education have been widely published with a total of 762 documents; from the number of records, there are several universities with a large number of publications, such as Tecnologico de Monterrey 15 documents; the University of Johannesburg, 11 documents; the Education University of Hong Kong 10 documents, University Kabangsaan Malaysia, King Abdulaziz University, Monhas University, Universiti Teknologi Malaysia and Beijing Normal University with 7 papers. Further, see Figure 4, which is published by affiliation.

The findings of the systematic literature review indicate that numerous authors have advocated for this concept via technology, specifically through modeling with chatbot applications, the implementation of pre-service teacher applications, and the influence of technology on enhancing students' comprehension and skills (Al-Abdullatif & Gameil, 2021), Each author and article published on specific AI and technology, such as (Belda-Medina & Kokošková, 2023), discusses how AI, through chatbots, facilitates English learning. Another article elucidates AI's role in promoting English acquisition or in understanding students' pedagogical approaches during lessons (Marrahi-Gomez & Belda-Medina, 2024). Various studies elucidate the role of technology in mathematics education in enhancing students' concentration during mathematics instruction (Graham et al., 2021; Saal et al., 2020b, 2020a). Numerous authors highlighted that the publication trend in leading papers indicates a shift in research topics towards the utilization of technology and AI to enhance students'

comprehension and foster greater intellectual development in academic disciplines at schools and universities.

This review found a match between the article title and several published documents; the issues in the article are highly relevant to the use of technology in educational management. For example, Kabilan et al. (2023) promote teaching using Gamification to create more specific learning objectives; this kind of teaching can integrate with the ministry-designed system to support teaching and the creation of a stable educational ecosystem (Aldekheel et al., 2022; AlQenaei et al., 2021). The research shows that educational management is increasingly developing to promote a more adaptive approach to the characteristics and generations born in different years. We found that the technology generation (Ugur et al., 2024)adapted to human generations through teaching methods and the use of technology (Basri et al., 2024).

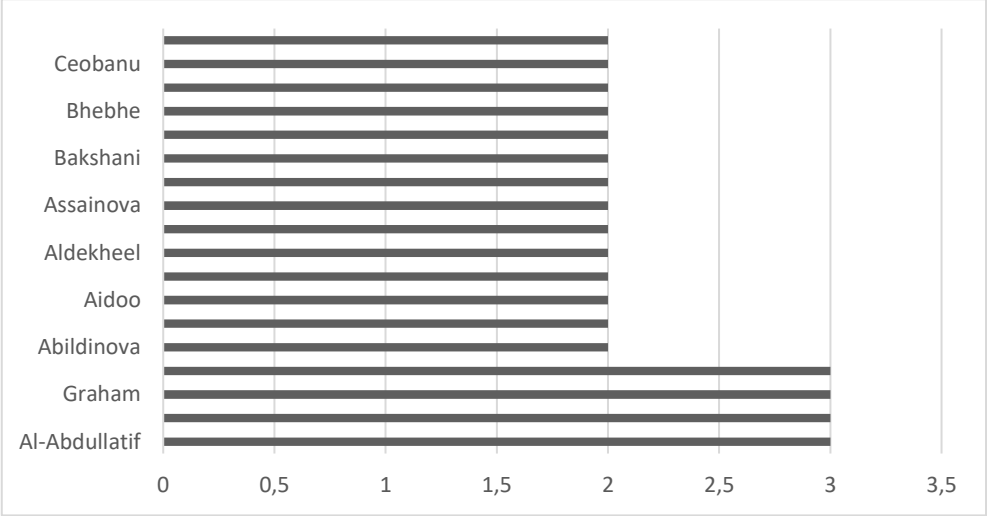


**Figure 5.** Publications by authors

In other categories, the review results in this article group several journals with the highest number of documents, totaling 762 articles published. Based on this number, several Publisher journals have the highest number of articles. This number indicates that the Journal's position is most decisive, given the suitability of the topic and the Journal's reputation. Table 1 contains several articles with the highest number of documents in the past five years; number Education and Information Technologies is the Journal with the highest number of documents, 39 papers; Education Sciences, 30 documents; International Journal of Emerging Technologies in Learning, 22 documents; British Journal of Educational Technology, and Cogent Education 20 documents. Other journals include the International Journal of Learning, Teaching and Educational Research (19 documents) and Frontiers in Education (18 papers).

**Table 1.** Publications by sources

| Source Title | Papers |
|---|---|
| Education and Information Technologies | 39 |
| Education Sciences | 30 |
| International Journal of Emerging Technologies and Learning | 22 |
| British Journal of Educational Technology | 20 |
| Cogent Education | 20 |
| International Journal of Learning, Teaching and Educational Research | 19 |
| Frontiers in Education | 18 |
| BMC Medical Education | 15 |
| Computer Applications in Engineering Education | 13 |
| Journal of Information Technology Education Research | 12 |
| IEEE Transactions on Learning Technologies | 11 |

*Source: Scopus Database, 2025*

Table 2 presents an analysis of articles with the highest citation counts over the past five years. The citation data indicates that many of these studies incorporated ICT, exemplified by Adarkwah (2021) which advocates for ICT utilization in the post-COVID-19 context, and (Okunlaya et al., 2022), which promotes service enhancements through AI integration. Numerous published articles indicate that ICT is the predominant subject of research, with related topics categorizing ICT functions into various types, including ChatGPT, chatbots, mathematical modeling, gamification, project-based learning, and studies involving nursing students or pre-service teachers in educational institutions. McKnight et al. (2016) evaluate the role of technology in education, emphasizing its purpose to enhance teaching and learning, and analyze the advantages this approach offers to both educators and learners.

**Table 2.** Highest citation by authors

| Document Title | Journal Title | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | Total |
|---|---|---|---|---|---|---|---|---|
| I'm not against online teaching, but what about us?: ICT in Ghana post Covid-19 | Education and Information Technologies | 2 | 29 | 51 | 78 | 54 | 4 | 218 |
| Artificial intelligence (AI) library services innovative conceptual framework for the digital transformation of university education | Hi Tech Library | 0 | 0 | 6 | 22 | 81 | 18 | 127 |
| Effects of learning physics using Augmented Reality on students' self-efficacy and conceptions of learning | British Journal of Educational Technology | 0 | 2 | 25 | 33 | 48 | 3 | 111 |
| Factors affecting Nigerian teacher educators' technology integration: Considering characteristics, knowledge constructs, ICT practices and beliefs | Computers and Education | 10 | 17 | 22 | 28 | 32 | 1 | 110 |
| Implementing challenges of artificial intelligence: Evidence from public manufacturing sector of an emerging economy | Government Information Quarterly | 0 | 0 | 6 | 16 | 44 | 7 | 73 |
| Modeling English teachers' behavioral intention to use artificial intelligence in middle schools | Education and Information Technologies | 0 | 0 | 0 | 5 | 59 | 5 | 69 |
| Assessing the digital competence of educators in social studies: An analysis in initial teacher training using the TPACK-21 model | Australasian Journal of Educational Technology | 6 | 11 | 14 | 17 | 21 | 0 | 69 |
| Exploring EFL university teachers' beliefs in integrating ChatGPT and other large language models in language education: a study in China | Asia Pacific Journal of Education | 0 | 0 | 0 | 0 | 44 | 23 | 67 |
| Technology integration for young children during COVID-19: Towards future online teaching | British Journal of Educational Technology | 0 | 1 | 21 | 22 | 22 | 1 | 67 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Potential to use metaverse for future teaching and learning | Education and Information Technologies | 0 | 0 | 0 | 1 | 60 | 4 | 65 |

The systematic literature review highlights the endorsement of technology, primarily through chatbot applications, in enhancing English language acquisition and improving mathematical education. Various authors focus on AI's role in facilitating learning and understanding pedagogical strategies. The publication pattern in leading journals shows a shift toward applying technology and AI to enhance intellectual growth in educational settings. Additionally, the incorporation of gamification is noted for establishing clear learning objectives, indicating an evolution in educational administration to accommodate different generational needs through adaptable pedagogical approaches.

### *3.2. Outcome of Technology Integration in Education Management*

Recent research on the integration of technology in educational management reveal various functions and classifications, indicating that technology is employed in educational management according to the educational level in each country. From the beginning, we realized that even though we had determined a specific topic, we needed to conduct a review. The results of the review show that the study of educational management in the use of technology is not an independent discipline. Hence, the results of the review show that this concept is comprehensive and warrants in-depth review, especially regarding how the function of technology encourages the development of educational management and increases students' understanding of learning. The idea of using technology in learning activities is predominantly promoted by developed countries that reflect the technological revolution in them; the results of bibliographic coupling by country show that citations by country are dominated by the United States, with 138 documents and 1255 citations, with a Link of Strength of 3386. China 68, 1093 citations and Link of Strength 3355. Australia 39 documents, citations 507 and 2399.

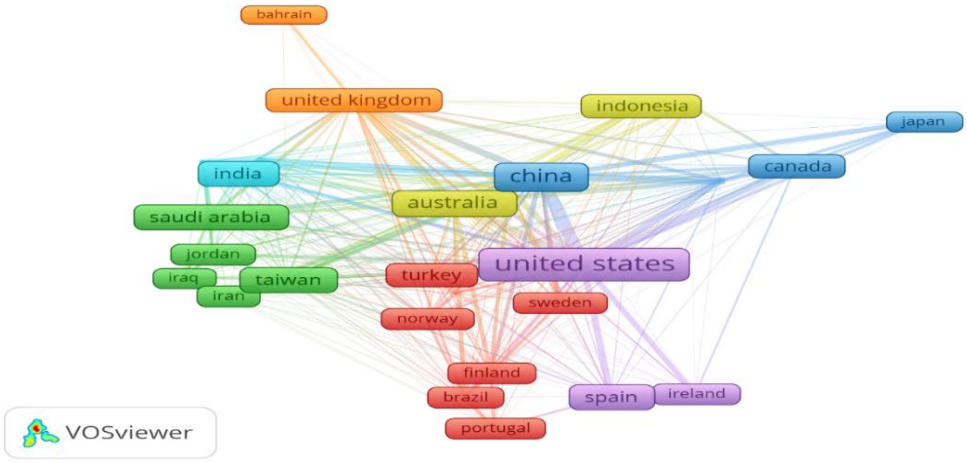


**Figure 6.** Citation by country and document

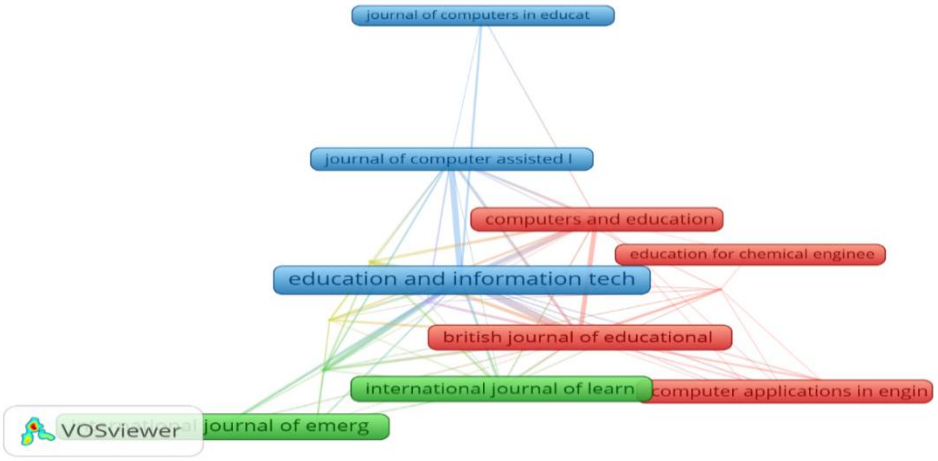


**Figure 7.** Citation by Sources

Figure 7 maps the citation sources used by publisher articles. Among the selected sources, there are journals with high citation and link strength. Education and Information Technologies citation 754 link strength 231, British Journal of Educational Technology 535 and 170, Computers and Education 265 and 87, Computers and Education Artificial Intelligence 64 and 77, Journal of computer-assisted learning 165 and 71, Interactive Learning Environments 206 and 67. Figure 7 illustrates a network visualization of technology integration in education, derived from 145 items that form five distinct clusters, each represented by a color group. Cluster 1 comprises 62 items, including academic performance, artificial intelligence, blended learning, chatbots, ChatGPT, collaborative learning, computational learning, digital literacy, digital technology, digital competency, entrepreneurship, game-based learning, generative artificial intelligence, industry 4.0, instructional design, language learning, pre-service teachers, self-regulated learning, teacher training, virtual reality, and pedagogy. Cluster 2 comprises 39 items, including control study, COVID-19, creativity, curriculum, deep learning, digital technology, distance education, distance learning, human experience, leadership, medical students, nursing students, and problem-based learning. Cluster 3 is designated in blue and comprises 34 items, including computer-aided instruction, critical thinking, decision-making, engineering evaluation, professional assistance, technology integration, mathematics, programming, special education, teachers, and technology integration. Cluster 4 comprises eight items: Internet of Things, machine learning, online learning, sustainability, sustainable development, and technology adoption. Cluster 5 is represented in purple and contains two items: challenges and nursing.

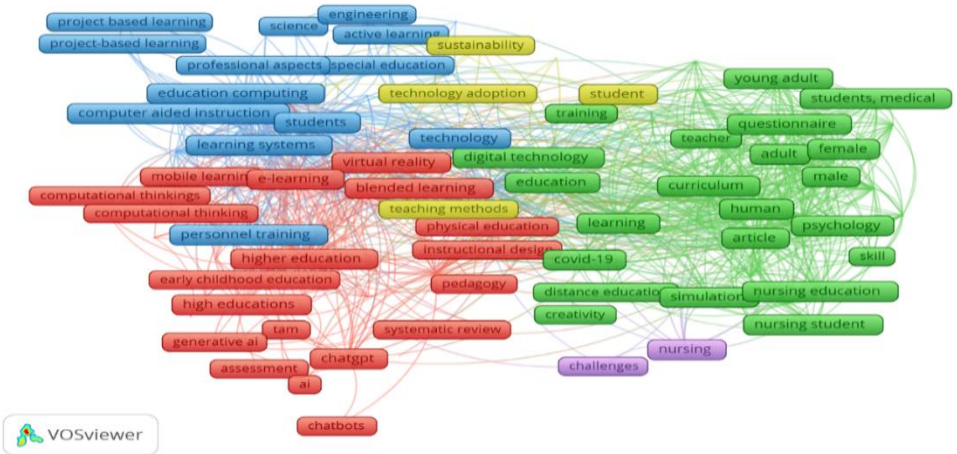


**Figure 8.** Network visualization using co-occurrence

From the five clusters, this review categorizes them into several significant sub-themes for each item. Cluster 1 Red is about the performance of learning and teaching by teachers and students through the use of AI (Eltahir et al., 2023; Eltahir & Babiker, 2024). Cluster 2 green concerns students' abilities in the learning process, as shown by their creative skills and understanding of the material (Henriksen et al., 2021; Wieser, 2020). Cluster 3 Blue is about the infrastructure used by students and teachers in learning and teaching activities (Azhibayeva et al., 2024; Islam et al., 2024; Zhang et al., 2024); the title of this study clearly states the country in which the research was conducted. Cluster 4 yellow, sustainable development and use of technology so that learning is sustainable and can be applied to other models or technologies, such as (Awodiji & Katjiteo, 2023; Opesemowo & Ndlovu, 2024), the topic of sustainable education development looks at how technology can drive education in the 21st century with different situations and conditions such as COVID-19 and can be applied to developing countries.

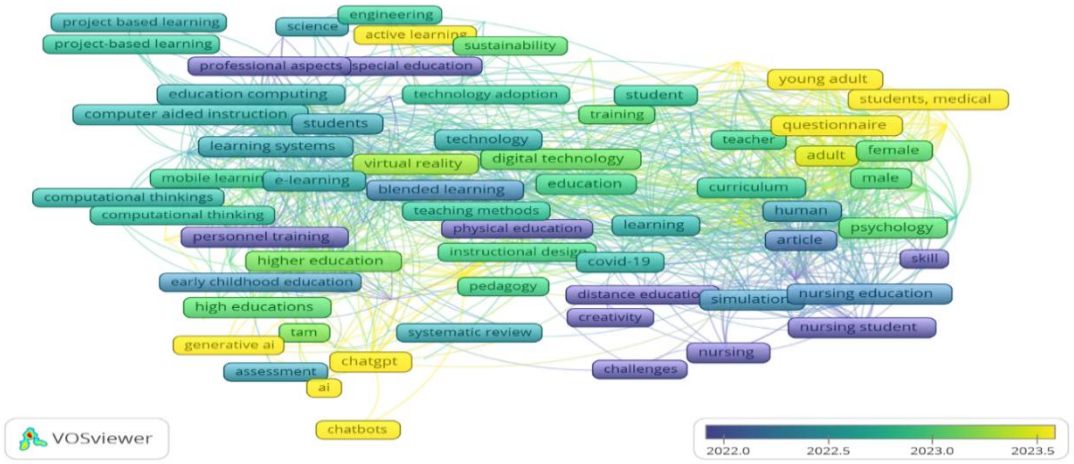


**Figure 9.** Overall Visualization using co-occurrence

In the last five years, the number of studies on integrating technology into education has been highly varied, as shown in Figure 8. Research trends in 2022.0 predominantly review distance education challenges, physical education, or creativity. This research topic is driven by teaching on online platforms due to COVID-19; in addition, the derivative topic of purple color is nursing students, a subtopic of COVID-19, as seen in (Alhashem et al., 2022; Chang et al., 2022; Issa Mauji et al., 2022). Other derivative topics in 2022.5 include project-based learning, educational computing, learning systems, e-learning, curriculum, and computational thinking, as evidenced by the research conducted (Arslan et al., 2022). Further co-occurrence analysis maps the number of keywords, and findings parse the dominant co-occurrence in the last five years; therefore, in 2023.0, the research trend began to shift to higher education with topics such as higher education, virtual reality, and digital technology. In 2023.5, educational management began using specific applications such as ChatGPT, chatbots, generative AI, virtual reality, and digital technology. Alshahrani & Qureshi (2024) proposed several research topics, suggesting that in 2024, learning using artificial intelligence would become popular (Urazbayeva et al., 2024).

Figures 9 and 10 show five mainstream groups in the use of technology or AI in educational management. It means that educational management focuses on improving students' skills and soft skills, so the learning process uses more modern tools such as iPads, cellphones, and notebooks. So that Miranda et al. (2021) assess the selection of technology based on technological developments from 1.0 to 4.0. Education 4.0 emphasizes a learning approach for students or pedagogy (Garzon et al., 2020). This kind of learning and teaching method creates a learning experience that helps students continue to grow with more modern resources. Haleem et al. (2022) state that learning through technology

encourages improvements in teaching quality, is more innovative and interactive, is accessible to students, and supports a more flexible, collaborative approach to learning activities. Therefore, this article shows that the use of technology in learning activities can be grouped with blended learning with technology integration.

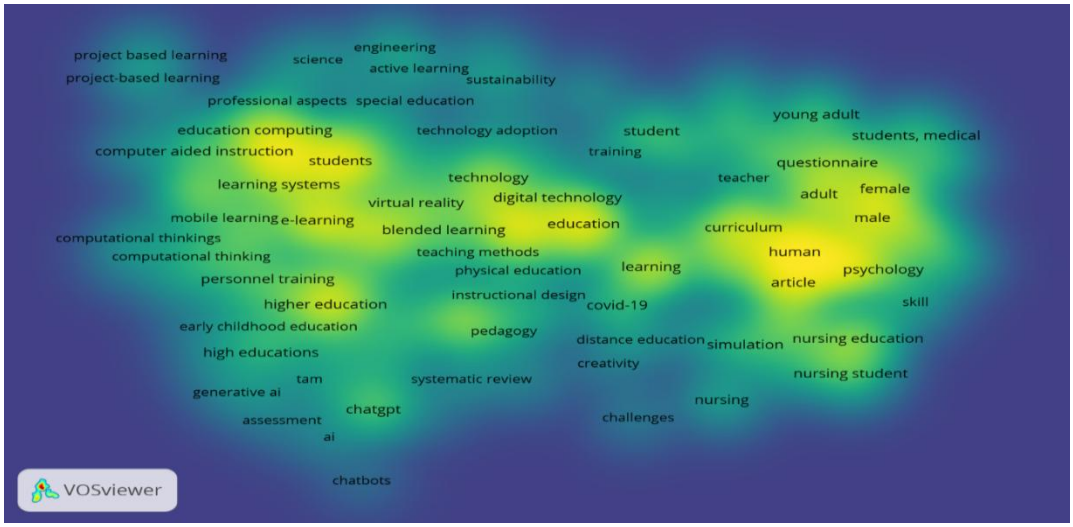


**Figure 10.** Density Visualization using co-occurrence

Figure 8 explains the dominant clusters and topics from the 2020-2024 range, while Figure 8 shows the dominant topics from all clusters and topics. The density in the figure indicates that issues such as education computing, learning system digital technology, personal training, and digital technology have a higher density level. In addition, the results showed that the character of technology use in higher education, such as in universities, differs from that in schools. At universities, the function of technology is used as a learning medium, not in elaboration, and it does not encourage increased creativity (Haleem et al., 2022). Therefore, it is essential to note that AI and IoT technologies serve different functions in higher education, such as e-learning, ChatGPT use, and student profile improvement. While in schools, the function of AI and IoT is to stimulate students to learn through the use of technology, several studies such as digital video (Estaiteyeh & DeCoito, 2024), technology integration in mathematics subjects (Li & Li, 2024), gamified learning (Rayan & Watted, 2024), or the use of AI in language teaching (Mananay, 2024).

In other investigations regarding technology utilization among nursing students or within nursing education, this cluster is less prominent than the primary cluster; it encompasses topics such as online training facilitation (Chang et al., 2022), enhancing online teaching capabilities for educators (Shon et al., 2024), and the application of service applications for nursing students (Ball et al., 2021). The study's findings address the limitations identified in Xiao's (2019) research on digital transformation in higher education institutions, demonstrating that, over the past five years, AI and IoT technologies have been applied across various learning scenarios (Ding et al., 2024). The study demonstrates that technology has been incorporated in all educational processes and management, whether conducted by schools or institutions of higher learning. Technology is perceived as a catalyst for enhancing student skills, learning capacities, and the quality of instruction in schools, colleges, and universities. Education management can be seen as a sustainable learning development framework that integrates technology with human learning capabilities and creativity or talents.

Lastly, this systematic review article addresses to the question that technology's primary role in educational management is in the application of learning, specifically how it may be utilized to enhance student comprehension through assessment and technology application. Nonetheless, schools and universities have distinct objectives in their technological applications, indicating that each educational institution fosters technology with varying aims according to the educational level. This study's

findings enhance the understanding of technology's role in educational management, an area previously neglected by researchers who failed to address its operational dynamics within this context.

## 4. CONCLUSION

This study concludes that research on technology integration in education has shown a modest but consistent increase between 2020 and 2023, with the adoption of Industry 4.0–related technologies gaining heightened attention during the COVID-19 pandemic despite existing prior to it. The findings reveal that countries such as the United States, China, Australia, Spain, South Africa, and Saudi Arabia have been the most prolific contributors, addressing diverse themes related to technology's influence on education. The review demonstrates that technology's primary role in educational management is largely centered on supporting learning applications, particularly through assessment and integrated digital tools that enhance student understanding; however, significant differences exist between schools and universities in terms of objectives and implementation strategies, underscoring the context-dependent nature of technology use. While this study contributes to a deeper understanding of technology's operational role in educational management—an area previously underexplored—it is limited by its reliance on Scopus-indexed publications from the past five years, which may restrict broader temporal and contextual insights. Future research is therefore encouraged to incorporate additional databases, longer time spans, and comparative analyses across educational levels, with particular emphasis on the evolving role of artificial intelligence, to inform more nuanced curriculum development and educational policy design tailored to distinct institutional needs.

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