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IMPROVING THE EDUCATION PROCESS WITH INNOVATIVE DIGITAL TECHNOLOGIES

Jumabayeva Nargiza Odilbekovna

Foreign philology faculty Urgench state pedagogical institute choqqam@gmail.com

Abstract: The research emphasizes how technological factors and historical context both impact the research topic. Technology plays a crucial role in facilitating the transformation and improvement of education, while the prevailing context is a significant driver in encouraging the integration of new technologies into the education system and the enhancement of education. Furthermore, the study pinpoints three key areas of focus in the field: physical education, digital transformation, and professional development in the context of digital technology promotion. This research provides a well-defined framework for the application of digital technology in education, offering valuable guidance for



scholars and educators interested in the theoretical and practical aspects of digital technology in education.

Keywords: *Digitalization, education, technology in education, personalized learning, digital literacy, infrastructure*

INTRODUCTION

The research emphasizes how technological factors and historical context both impact the research topic. Technology plays a crucial role in facilitating the transformation and improvement of education, while the prevailing context is a significant driver in encouraging the integration of new technologies into the education system and the enhancement of education. Furthermore, the study pinpoints three key areas of focus in the field: physical education, digital transformation, and professional development in the context of digital technology promotion. This research provides a well-defined framework for the application of digital technology in education, offering valuable guidance for scholars and educators interested in the theoretical and practical aspects of digital technology in education. Over the past two decades, digital technology has made significant progress in education, particularly in expanding the scope of learning by extending educational time and space, and creating new, sustainable learning environments. Although there have been various research efforts to consolidate the use of digital technology in education, earlier studies have typically focused on specific aspects, such as its application in higher education or its role during the pandemic. While these studies offer useful insights into the practical use of digital technology in certain educational contexts, they do not provide a comprehensive exploration of the broader mechanisms and internal logic behind its implementation in education. Moreover, the relatively short timeframes of these studies limit their ability to offer a full understanding of the broader dynamics and evolution of digital technology in education. Some research offers general overviews of digital education from an educational standpoint, but lacks a detailed understanding of technological advancements and changes. Therefore, this study aims to take a systematic, scientific approach to gather relevant research from 2000 to 2022, with the goal of understanding the internal logic and development trends of digital technology in education and recognizing its significant contribution to the



sustainability of education over time and space. In summary, the study aims to address the following questions:

What has been the distribution of research productivity in the field of digital technology education applications since the turn of the century, in terms of authorship, geographic regions, institutions, and journals?

What trends have emerged in research on the application of digital technology in education over the past two decades?

What are the current research frontiers in the application of digital technology in education?

While the term "digital technology" has become widely used, scholars have yet to reach a consensus on a unified definition, as its meaning is closely tied to specific contexts. In the field of educational research, Selwyn's (2016) definition is widely accepted. Selwyn offers a comprehensive perspective on various digital technologies and their applications in education, illustrating his points through ten specific cases, including immediate feedback in classes, the orchestration of teaching, and community-based learning. Through these examples, Selwyn argues that digital technology encompasses a range of devices and platforms associated with digital tools, such as tablets, smartphones, computers, and social media platforms like Facebook and YouTube. Additionally, he suggests that accessing the internet through portable devices at any location represents an extension of digital technology use. The evolving nature of digital technology has profound implications for education. In the 1990s, the focus of digital technology in education was primarily on understanding the complexities of digital spaces, digital culture, and educational methodologies, with a particular emphasis on e-learning. However, the widespread adoption of mobile devices since the early 2000s has significantly expanded the scope of digital technology. Mobile learning devices, such as smartphones and tablets, along with social media platforms, have become integral elements of digital technology. In recent years, the increasing application of artificial intelligence (AI) in education has further enriched the concept of digital technology. Tools like ChatGPT, for example, are recognized as innovative educational technologies with the potential to transform the future of education. Pinto and Leite (2020) conducted an extensive survey on the use of digital technologies in



education, identifying three key categories: technologies for assessment and feedback, mobile technologies, and Information Communication Technologies (ICT). Their classification provides a broad yet concise framework for understanding the different aspects of digital technology. In line with the established definitions of digital technology in educational research, this study adopts the characterizations proposed by Selwyn (2016) and Pinto and Leite (2020) as foundational criteria for analysis. These criteria encompass a wide range of digital technologies, including ICT, mobile tools, eXtended Reality (XR) technologies, assessment and feedback systems, Learning Management Systems (LMS), publishing and sharing tools, collaborative systems, social media, interpersonal communication tools, and content aggregation tools.

METHODS AND RESULTS

Research on the econometric properties of various aspects of human production and life has been ongoing, yet it has lacked systematic theoretical guidance, leading to a degree of disorganization. In 1969, British scholar Pritchard introduced the concept of "bibliometrics," which later developed into a distinct field within scientific quantification research. Initially, Pritchard defined bibliometrics as "the application of mathematical and statistical methods to books and other communication media," though this definition was somewhat imprecise. To address this, Hawkins expanded Pritchard's definition in 2001, describing bibliometrics as "the quantitative analysis of the bibliographic characteristics of a body of literature." De Bellis further refined the goals of bibliometrics, stating that its purpose is to analyze and identify patterns within literature, such as the most productive authors, institutions, countries, and journals in various scientific disciplines, as well as trends in literary production over time and collaboration networks. Garfield (2006) added that bibliometric research enables the study of the history and structure of a field, the flow of information, the impact of journals, and citation trends over extended periods. These definitions highlight bibliometrics as a unique method for assessing specific research fields. This study employs CiteSpace, VOSviewer, and Charticulator for data analysis and visualization, with each tool offering distinct strengths that complement one another. CiteSpace and VOSviewer utilize set theory and probability theory to provide various visualization views, such as keyword



co-occurrence and co-authorship networks. Both tools are user-friendly and produce visually engaging outputs, making them two of the most popular bibliometric tools in the field (Chen, 2006; van Eck & Waltman, 2009). VOSviewer was primarily used in this study to perform the performance analysis, while Charticulator was employed to refine the visualizations, particularly the chord diagram for country collaboration, based on tabular data exported from VOSviewer. CiteSpace played a crucial role in generating keyword maps and conducting burst word analysis, further enhancing the study's bibliometric mapping efforts.

DISCUSSION

The field of research on the application of digital technology in education has experienced considerable growth since the beginning of the 21st century, as evidenced by analyses of authorship, country/region contributions, and institutional engagement. This expansion reflects both the increasing incorporation of digital technologies in educational environments and a growing scholarly focus on optimizing their use. The distribution of authorship in this field reveals the intellectual framework and depth of digital technology education research. A leading figure is Neil Selwyn, whose high citation rate highlights the significant influence of his work. Selwyn's focus on the role of digital technology in higher education and educational sociology has been particularly impactful. His research on the spatiotemporal extensions of education through digital tools offers important insights into the complex ways in which technology enhances and transforms learning processes. Other key contributors to the field, such as Henderson and Edwards, focus on diverse areas, including the role of digital technologies during the COVID-19 pandemic and their application in early childhood education. This diversity of research interests emphasizes the broad scope of digital technology education research, which spans pedagogical innovations, technological adaptations, and policy considerations. On the international stage, the United Kingdom, particularly England, stands out as a major contributor, with 92 published papers and a high citation count. Australia and the United States follow closely, forming a strong axis of English-speaking research in this field. The high concentration of scholarly output in these countries is often linked to significant investments in research and development,



advanced technological infrastructure, and a strong presence of higher education institutions engaged in innovative research. China's inclusion among the top contributors is noteworthy, as it is the only non-Western country with a significant presence in the field. This suggests a growing interest and capacity for research on digital technology in education. However, the lower average citation per paper for Chinese publications may indicate that while the country is emerging as an active participant, its research has yet to achieve the same level of international recognition as that of Western nations. The use of a chord diagram to analyze collaborations between countries highlights dense connections among the United States, China, and the United Kingdom. These strong international collaborations are crucial for addressing global educational challenges and shaping the future of digital technology in education through shared knowledge and resources.

CONCLUSION

The use of digital technology in education spans multiple technical and educational domains and continues to grow rapidly due to ongoing technological advancements. This study employed bibliometric techniques to systematically review the field's development, focusing on leading contributors, national institutions, key publications, and evolving trends. The quantitative analysis provided several key insights into the current state and future directions of research on digital technology applications in education.

Key Findings: The research field of digital technology applications in education has entered a phase of rapid growth, particularly accelerated by the COVID-19 pandemic, which led to a surge in publications. Prominent authors such as Selwyn, Henderson, and Edwards, as well as countries like England, Australia, and the United States, have made significant contributions to the field. There is also a notable increase in international collaboration, with higher education institutions in the UK and Australia playing a pivotal role in driving research at the institutional level.

Key Journals Journals such as *Education and Information Technologies*, *Computers & Education*, and the *British Journal of Educational Technology* have become prominent platforms for disseminating research on digital technology in education. These publications, which focus on educational technology, facilitate the sharing of knowledge and



advancements in this field. Over two decades, research on digital technology applications in education has evolved through several stages: from initial development and critical exploration to a phase of accelerated transformation. The field is now approaching maturity, with technological innovation and societal changes being key drivers of educational transformation and progress. The pandemic has given rise to three key areas of emerging research: physical education, digital transformation, and professional development supported by digital technologies. These research hotspots reflect the core challenges faced by the education system as it integrates new technologies. As technological breakthroughs redefine the traditional boundaries of education in terms of time and space, these new challenges require continuous problem-solving, contributing to the ongoing evolution of the field. Practical Implications: This study offers several practical implications for both scholars and practitioners: Framework for New Researchers: The research presents a clear framework of the existing literature, serving as a guide for newcomers to the field and providing insights into its developmental trajectory. Identifying Research Hotspots: By highlighting current research trends and emerging topics, the study offers valuable guidance for scholars looking to explore future research directions. Core Journals: An extensive analysis of published literature identified Sustainability as a promising open-access journal that frequently publishes research on digital technology in education. This insight can assist scholars in selecting appropriate outlets for their work. Overall, the study provides a comprehensive overview of the research field and offers strategic insights for future scholarly exploration.

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MAKTAB INFORMATIKA O‘QITUVCHISINING METODIK TAYYORGARLIGINI SHAKLLANTIRISHDA KASBIY KOMPETENTLIKNING O‘RNI

M. Berdibaev

Nuqs davlat pedagogika instituti katta o‘qituvchisi

M. Babanazarova

Innovatsiya instituti assistent o‘qituvchisi

Summary: In the thesis, the role of professional competence in the formation of methodical preparation of students in increasing their creative activity is considered. Pedagogical and psychological tasks that students should solve in the process of creative thinking on the basis of competence are defined in the thesis.

Key words: competence, special competence, social competence, personal competence, individual competence.

O‘zbekiston Respublikasini yanada rivojlantirish bo‘yicha harakatlar strategiyasiga ko‘ra O‘zbekiston Respublikasi ijtimoiy-iqtisodiy rivojlantirish dasturiga asosan O‘zbekistonda ta‘lim tizimini rivojlantirishning asosiy yo‘nalishlari belgilab olindi. Qo‘yilgan