



Research Trend on Educational Technology Issue: Post Pandemic Instructional Preference on Digital Utilization

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Abstract. The goal of this research is to look at the characteristics, and general trends in Educational Technology articles produced by writers/authors and published in journals listed in the Thomson Reuters Web of Science, Elsevier Scopus, and Eric from 2017 to 2022. Using the ‘Educational Technology Papers Classification Form, (Thomson Reuters Web of Science; 510; Elsevier Scopus: 245; Eric: 350) articles published in journals were subjected to content analysis. According to the findings, the number of published Educational Technology research increased considerably between 2017 and 2022. The articles’ main topics were digital education, distance education, and multimedia technology, while there were differences in research topics and methodology. The majority of publications cited when articulating the definition of digital utilization. According to the evaluation, the majority of university students and lecturers have a basic degree of digital proficiency. Furthermore, higher education institutions are encouraged to focus on developing students and teachers’ digital utilization, developing relevant learning methodologies, and employing appropriate tools to improve educational quality.

Keywords: educational technology · research trend · content analysis

1 Introduction

People are surrounded by digital devices and the Internet these days. Technology developments and the evolution of social structure have already altered not just how we live, but also how we learn. The Covid-19 pandemic outbreak has caused a halt to typical traditional educational activities. Many institutions and groups are updating their instructional techniques in an effort to give their students access to easy, secure, and adaptable learning environments [38]. Because college students in the twenty-first century are the generation who have grown up with the rapid development of computer networks and who have experienced the unprecedented development of online media represented by the Internet, virtual reality, and artificial intelligence, as well as because the Covid-19 has increased social attention to the need for digital skills, the emphasis

on digital competence continues to grow in popularity in higher education [22]. Furthermore, today's prospective educators are tech-savvy individuals who would greatly benefit from integrating these applications into the teaching-learning process because they are digital natives [18]. In order to meet the substantially increased teaching criteria and make adjustments to the new teaching environment, active-duty teachers should also build associated capacities.

New conditions for the knowledge society have emerged as a result of the rapid advancement of new information and communication technologies. Since the 1990s, the industrial and information eras have gradually given way to the knowledge era in many nations. The development, production, processing, and application of knowledge all contribute significantly to a nation's economic growth and have progressively become necessary. Human epistemology and structure have changed as a result of the knowledge society. Digital competence is one of the most crucial characteristics that set the knowledge society apart from the information society when we talk about it. While the information society just produces and spreads raw data, the knowledge society works to transform information into resources that allow society to take productive action [9].

Online learning has grown rapidly in recent years, because to advances in information and communication technology (ICT). Online learning has some advantages over traditional offline training. First, by providing students with individualized instructions and rapid feedback, online learning can make the learning process more student-centered [3]. Second, online learning is less expensive, which promotes broader access to high-quality education [29]. Third, online learning is simple to use. It expands learning chances for people who reside in rural and distant places where educational resources are few [5]. Given the benefits of online learning, techno-optimists think that its widespread adoption has the potential to improve educational quality and increase equity across the education sector.

Today, more than ever, technology plays a crucial role in the advancement of education. Researchers in educational technology have become interested in the rapidly expanding field of technology use in education, particularly in areas like distant learning, simulations, educational games, and virtual worlds. The research and moral application of promoting learning and enhancing performance through the development, utilization, and management of suitable technological procedures and resources is what the Association for Educational Communications and Technology (AECT) defines as educational technology [2, 4]. Over the past century, the field of educational technology has undergone significant growth and development due to a variety of factors, including historical events, paradigm shifts in educational psychology, rising technologies, and changing modes of investigation. In addition to advancements and improvements, many research methodologies are frequently applied in this area [11]. Practitioners and researchers in educational technology look at a variety of subjects.

Researchers in the field of educational technology have already identified trends in papers, theses, and dissertations. International journal articles have been evaluated by certain scholars from throughout the world [20, 21, 26, 30, 36]. However, the academic literature has paid relatively little attention to journal articles on educational technology that were authored by authors from different parts of the world. It's a good thing that more of these studies have been conducted recently [1, 6, 14, 19, 24, 40]. Thesis or

dissertation research in the area of educational technology has also been looked at by certain researchers [8, 12, 31, 41]. In most cases, the research subjects, research procedures, and data collection techniques are chosen by the researchers themselves. Fig. 1 presents an overview of the current literature of Educational Technology surveys using these three classifications.

In order to better prepare us for upcoming research challenges, this study reviews the previous five years' worth of research in educational technology. The findings may also be used to improve the quality of upcoming research studies by drawing researchers' attention to key issues and gaps identified in the current study. Additionally, researchers in educational technology from various nations will be able to contrast the findings with those from their own. Examining the characteristics and broad trends in educational technology research undertaken by writers and published in international journals listed in the SD, SJ, and ERIC indices between 2017 and 2022 is the goal of this study. The precise research inquiries that served as a guide for this investigation are:

- 1) Which publications published papers on educational technology most frequently?
- 2) What subjects were frequently investigated?

2 Methodology

To determine the trend of research on educational technology, a systematic review was applied [42]. To better convey research on the use of educational technology in higher education and to summarize and analyse the results, two research inquiries were conducted [15]. This review followed the framework of another systematic review that was recently completed on themes related to educational technology and was based on the principles for systematic literature reviews offered by [10, 25]. Each article was analyzed with the content analysis methodology. The term "content analysis" can be used to refer to a wide range of textual studies, most of which focus on comparing, contrasting, and categorizing a set of data. Consequently, it was applied to categorize the data and divide it into many recognized themes and concepts [4, 13, 39].

2.1 Sample

The sample for the study included 1105 Educational Technology publications written by writers and published in international journals. These items are all included in the Thomson Reuters Web of Science (TRWoS), Elsevier Scopus (ES), and (Education Resources Information Center (ERIC) indexes from 2017 through 2022. The authors reviewed the journal lists in the TRWoS, ES, and ERIC indexes and found journals that are primarily concerned with Educational Technology [7, 33]. In addition to these journals, it was attempted to identify journals that contain papers connected to Educational Technology. Expert juries in the field of "education, instructional media, internet, digital media, computer, technology, research" are keywords established some keywords that may appear in the titles of publications related to Educational Technology for this purpose. The review resulted in the selection of 85 journals (SD: 30, SJ: 35, ERIC: 20). Then, full length articles written by authors in these journals and published between 2017 and 2022 were analyzed. The abstracts of these publications were examined and it was determined

whether they were relevant to the topic of Education Technology. Finally, the scope of the study was decided by 130 articles published in 85 journals. Figure 1 depicts the data gathering procedure.

2.2 Data Analysis

The research questions should be clearly stated at the start of the review as an objective to be answered. The databases used for the search are then listed, together with the search phrases and the criteria used for study evaluation and selection. Finally, we will discuss the articles that were included at the conclusion of the process. The procedure is divided into three major stages: selecting, identifying, and synthesizing [16].

Initially, the authors collaborated to achieve a valid classification of the publications. The articles were categorized into groups. During the content analysis process, initial differences were discussed and resolved, and the rest of the articles were studied collaboratively by the authors. Any conflicts were again handled under the supervision of the supervisor. The researchers checked the data for transmission faults. Finally, the information was organized in accordance with the study questions. Descriptive statistics were used to examine the data gathered from the articles. The percentage and frequency of the items were computed.

3 Result

We provide answers to the research questions in this section by analyzing the selected publications. It is organized in accordance with the issues given, and it presents the findings of the systematic literature review (SLR).

3.1 Which Publications Published Papers on Educational Technology Most Frequently?

The subject of associated educational technology is covered in this literature study by referring to TRWoS, ES, and ERIC resources. To begin with, nine of the selected articles referenced to AECT's Key Competences for Educational Technology Reference Framework. It defined digital competence as "the confident and critical use of information society technology for work, pleasure, and communication," indicating that educational technology has been regarded as one of the eight fundamental competences for life-long learning. It is founded on fundamental information and communication technology abilities, such as the use of computers to collect, analyze, store, produce, display, and exchange information, as well as to communicate and engage in collaborative networks over the internet" [2].

Table 1 below shows the journals that published the most articles between 2017 and 2022 according to their listing indexes. Australasian Journal of Educational Technology (AJET) published the most papers in the Thomson Reuters Web of Science, international Journal of Interactive Mobile Technologies (IJIM) published the most in Elsevier Scopus, and International Journal of Instruction (IJI) published the most in ERIC.

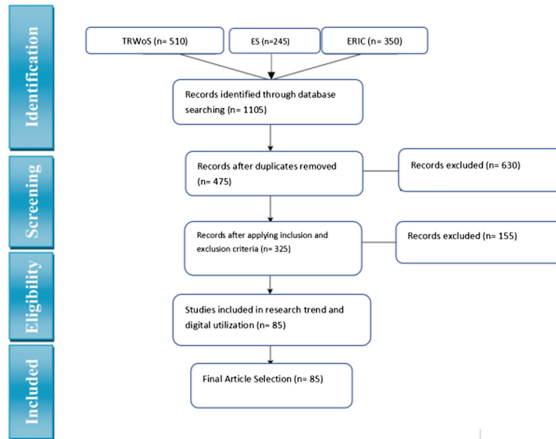


Fig. 1. Data Extraction Procedure

As one of the study trends in educational technology, digital competence is defined as the capacity of users to make a safe, critical, and creative use of ICT to achieve various purposes [17]. Additionally, [34] divided an educator's digital proficiency into six categories: 1) professional engagement, 2) use of digital resources, 3) teaching and learning, 4) assessment, 5) empowering learners, and 6) facilitating the development of the learners' digital proficiency [37]. A model of digital competence for trainers was developed by DigcompEdu [35]. Following the main abilities of digital competence, [32] presented teacher digital competence (TDC). The Common Digital Competence Framework for Teachers, which was developed by the National Institute of Educational Technologies and Teacher Training (INTEF) and adapted from DigComp and DigCompEdu, is described in [28] work as having a high level of comprehensiveness and being divided into 5 competence areas with 21 competencies, which are defined as the competencies [23]. The theoretical works of the International Society for Technology in Education (ISTE) have been established as guidelines for educators with the goal of assisting teachers in becoming digitally empowered learners [35] (Table 2).

4 Discussion

The COVID-19 pandemic has sped up the use of online education in the educational sector. Online learning did not eliminate education inequalities; nevertheless, it did provide learning continuity while school-based education was disrupted. It is critical to thoroughly consider the equality issue of online learning given that its dissemination is unavoidable in the near future. Learning gaps resulting from the epidemic can reflect and amplify already-existing inequality. There were already differences in learning performance between various student groups before the COVID-19 epidemic. The pandemic's effects on education merely moved traditional classroom instruction online. Groups that have historically been vulnerable are still in a disadvantageous situation. It implies that implementing a comprehensive online education system might not be able to address the

Table 1. Journals Commonly Published on Educational Technology Studies

Indexes	Journals	N
Thomson Reuters Web of Science	Australian Journal of Educational Technology	110
	Educational Technology & Society	70
	International Journal of Educational Technology in Higher Education	69
	British Journal of Educational Technology	61
	ETR & D-Educational Technology Research and Development	58
	Journal of Special Education Technology	54
	International Journal of Distance Education Technologies	48
Elsevier Scopus	international Journal of Interactive Mobile Technologies	90
	International Journal of Educational Research	53
	Computers and Education	40
	International Journal of Educational Development	27
	Educational Technology and Society	25
	Journal of Educational Science and Technology	10
ERIC	International Journal of Instruction	70
	Education and Information Technologies	68
	Journal of Education and Learning	62
	Interactive Technology and Smart Education	40
	Review of Education	50
	International Journal on E-Learning	32
	Educational Media and Technology	31
	Contemporary Educational Technology	28
Journal of Interactive Media in Education	9	

issues related to educational inequality. Traditional vulnerable groups do not have the resources or skills necessary to benefit from online education. According to the findings of our study, if we could assist historically underprivileged populations in adjusting to on line learning, they might benefit more than their advantaged counterparts. This disparity might be explained by the declining marginal value of resources. The marginal value of extra investment in advantaged students is lower than the marginal benefit of increased investment in disadvantaged students because they already have access to better educational resources.

In order to investigate the numbers published in each publication and the topics of the research, 1105 international journals that are indexed in the TRWoS, ES, and ERIC were

Table 2. Research Subjects Trend in Educational Technology

		Distance Education and Digital Learning	Teacher Education	Multimedia	Education and Performance	Environment and Technology	Research and Theory	Design & Development	Other	Totals
TRWoS	n	110	70	69	61	58	54	48	40	510
	%	21.6	13.7	13.5	11.8	11.3	10.6	0.9	0.8	100
ES	n	80	53	35	27	25	10	10	5	245
	%	32.7	21/6	14.2	11	10	0.4	0.4	0.02	100
ERIC	n	70	68	62	50	32	31	28	9	350
	%	20	19	17.7	14	0.9	0.9	0.8	0.26	100
Total	n	260	191	166	138	115	95	86	54	1105
	%	23.5	17.3	15.0	12.5	10.4	8.6	7.8	4.9	100

searched for studies on educational technology that were done by authors and published. The most articles were published between 2017 and 2022 in AJET under the TRWoS index, iJIM under the ES index, and IJI under the ERIC. The fact that AJET and iJIM are published online and have more issues each year may be the cause of the high number of articles in these journals. Additionally, these publications solely publish research related to educational technology. Another factor could be the increased demand for journals from throughout the world by researchers [14, 27].

The most common topics in studies indexed within the TRWoS were educational digital technology, distant education, and multimedia, according to the distribution of article subjects by the three indexes. The most popular topics in the ES were educational environments and technology, design and development, and multimedia. The most topics in ERIC were distance learning, educational environments and technology, and education and performance. The literature also claims that topics like educational environments and technology, online learning, and multimedia are regularly discussed [41]. In comparison to other indices, the TRWoS had a higher percentage of studies on design and development. This is probably because digital technology, design, and development are these magazines' main areas of focus. The three indexes reflect a varied variety of research on educational technology because there is overall heterogeneity in the subjects throughout the indexes.

5 Conclusion

This systematic review gives an overview of recent research on digital competence in higher education settings in terms of study objective and outcomes, as well as an introduction to how trend subjects on educational technology are defined and used in higher education. It outlines the developments and patterns in the past five years of study on digital topics in higher education. 85 papers in all were examined during this review. A general conclusion about the definition of the research trend on digital use in education is that the publications that were studied characterized digital competence in a generic

way by referring to policy documents and associated research, even if it can be present from several viewpoints.

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