Analysis of Articles on Education and Instructional Technologies (Scopus)

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Abstract—It is an indisputable fact that technology is a part of our lives. It is known that research and education technologies are concentrated. By examining the articles and dissertations published in the field, the scope, strengths and weaknesses of the studies were determined. An important gap has been filled in to guide researches what kind of studies may be needed in the future. Many studies for this purpose were found in the literature. However, since similar studies dealing with educational technologies are outdated, this study is considered important in terms of gathering current research trends and results. The aim of this study is to analyse the articles published in the Scopus database on educational technologies and instructional technologies, thematically and methodologically. The study was designed by adopting a case study from qualitative research models. The sample has not been determined for postgraduate dissertations to be included in the study, and it was aimed to reach the whole universe. In this context, all articles have been accessed through the library system of the university in the Scopus database included. The keywords 'educational technologies' and 'instructional technologies' were used in the article search. The document types have been examined by year, by country, by authors, by field research and by place of publication.

Keywords—Educational technologies, instructional technologies, research trends, Scopus

1 Introduction

Information has never been static. New information is constantly being added over old information. People learn throughout their lives by nature. The lifelong learning desire raises the question of how to learn. With the start of producing solutions to learning in the concept of educational technology, different dimensions have been discovered by undergoing significant changes with the external factors under its influence. In the literature review, it can be seen that there are many definitions of educational technology [31]. The oldest definition of educational technology is defined as the use of equipment in education. Today, educational technology covers many subjects from technology and human interaction to performance technologies, from computer-aided education to virtual education, from active teacher to passive technique and to teaching with gamification. Educational technology is of great importance in the theories emerging in the field of educational sciences, and in the application of these theories and the development of applications. Educational technologies are generally not only seen as a solution to the real or perceived shortcomings of traditional methods. The purpose of educational technology can also be defined as the tools to reduce inequalities in educational opportunities worldwide [11,14,16]. Wired training has been introduced as a technology to improve not only training opportunities but also general access to information.

Rapid developments in technology and science have turned countries into a race course, and this race has become a necessity rather than a privilege to develop new technological opportunities. It is inevitable to keep up with the developing technology and the time. It is necessary to improve by adding technology to education, as our age is developing too. In order to realise the role of education, it is necessary to make efficient use of technology in educational activities. The machines, systems and methods that contribute to the processes of applying science to the problems in production, transportation, service, trade, and that serve as a bridge between science and practice are called technology. Educational technology is called the process required for the design, implementation and development of teaching–learning processes [1,12,16,18,19,24,25]. The concept of educational technology has moved away from the initial definition of 'equipment used in education' over time; it has evolved over time and has become a discipline in its own right, covering many areas from technology–human interaction to performance technologies. It plays an important role in understanding its historical development. For this purpose, it is thought that the studies conducted will be a guide in revealing the current trends in the field, in understanding which subjects have reached the saturation and in determining what kind of new researches are needed.

Advances in technology also affect the concept of Science. Developments in science and technology require some changes in educational practices. The use of technology-learning environments is increasing. Educational technology is related to the teaching process and helps to achieve the goals set. However, there is a difference between the concept of educational technology and the concept of instructional technology. 'Instructional technology' is a technology-related term that is regulated depending on the sub-concept of 'teaching' and taking into account the specific

aspects of certain teaching disciplines, for example, 'science teaching technology'. 'Educational technology', on the other hand, develops, applies and evaluates appropriate designs by employing relevant elements (human power, knowledge, method, technique, equipment, etc.) to systematically analyse the problems involving all aspects of the phenomenon of 'human learning' and to develop solutions for them. It is a complex process. The term 'educational technology' emphasises a discipline related to learning and teaching processes. On the other hand, the term 'instructional technology' expresses the effectiveness of guiding learning in teaching a subject [31].

When the studies conducted were examined, we could see that the studies on educational technology do not have a long history. The joint use of different research approaches in social sciences and behavioural sciences is one of the recurring discussion topics, especially between different positivists or post-positivists and different analyses, namely qualitative or quantitative [29]. Trends in educational technology research attracted the attention of researchers who contributed to their own studies [9,10,15,17,18] Mihalca and [23,32]. Caffarella [4] first evaluated doctoral studies between 1987 and 1988. Again, the same researcher Caffarella [3] evaluated 2,689 dissertations between 1977 and 1998. Caffarella updated the list at different times and between 1977 and 2006 wrote and submitted all doctoral theses to Cortland Services University Library. Goktas et al. [8] study, conducted in the five largest universities in Turkey over the past decade in education technology doctorate, was completed in the field in Anadolu, Ankara, where most of these theses were carried out. In addition to Orta Doğu Teknik, Hacettepe and Marmara universities, a total of 64 thesis examinations were carried out by scanning the library of the Council of Higher Education. The results obtained in this study revealed a variety of subjects related to educational technology in Turkey which have not yet been carried out, and the study concluded that there were serious problems, particularly in terms of internal and external validity in existing studies. Reviews other than the studies by Caffarella and Sachs [4] do not have a quality indexing system. Hranstinski and Keller [10] examined the articles in the Computers and Education, Educational Media International, Journal of Educational Computing Research and Journal of Educational Media; Ross et al. [23], Hew et al. [9] and Masood [19] examined the articles in the Educational Technology Research and Development (ETR & D); and Latchem [15] examined the articles in the British Journal of Educational Technology.

Every new research that is planned before a research is carried out starts and takes shape with the examination of previous researches. Especially, if we look at the researches in the field of education and training technologies, it is more important to base it on the current literature than on the importance of studies in other fields. The reason for this situation is that technology is a rapidly changing and developing field. Determining research topics is a difficult process for any researcher. The first studies in the field of technology are mostly on the effects of educational software and similar technologies on student achievement and motivation. Due to the convenience and increase in internet environments, researchers have started to examine the role of technology in educational environments in terms of teachers and its effect on the education and training process. In these studies, technology has been considered as an integral part of the education–teaching environment rather than a tool through which

the teaching content is transferred [7]. In the literature review of instructional technologies, it can be seen that studies are carried out using different research methods, not using the research methods used in different educational settings. There are many meta-analysis studies examining the effects of technology on student achievement [30].

Every new research that is planned before a research is carried out starting with the examination of previous researches and is shaped according to the results. In particular, when researches in the field of education and training technologies are examined, it is more important to be based on an up-to-date literature review compared to the importance of studies in other fields. This research reviews the articles on educational technology and instructional technology published in journals in the Scopus database: Therefore, this research is important in terms of evaluating the results of the studies in the field of educational technologies and teaching technologies regarding the year, the country, the department and their publication type.

1.1 Purpose and importance of the study

The purpose of this research is to systematically analyse the articles published in the Scopus database and scan its index by examining it according to the determined themes and discussing them with other related basic concepts. The research will contribute to the studies on future educational technologies and educational technologies.

2 Method

This study was carried out using qualitative research methodology, content analysis and document analysis. The most important point in content analysis is to interpret similar data within the framework of the determined themes in a way that the reader can understand [26]. Content analysis is a scientific framework that provides systematic analysis of written, oral and other sources. Ozberk and Uzunboylu [22] and Odabasi et al. [21] define content analysis as concise messages in existing documents.

2.1 Data collection and analysis

Among those published in the Scopus database, the research was carried out using the keywords ‘mobile teaching and the hearing impaired’ in the Scopus database, and as a result of this, 232 documents were obtained, as shown in Figure 1. Documents taken from the Scopus database were analysed, linked to each other and integrated, and the data were analysed with content analysis.

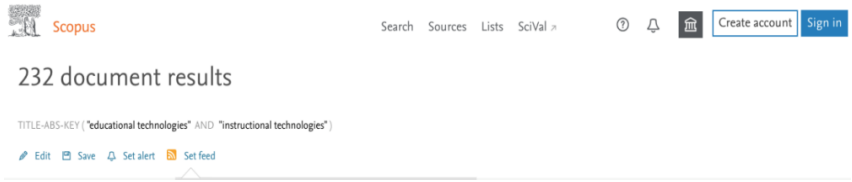

Fig. 1. The documents accessed on Scopus database using the keywords 'educational technologies' and 'instructional technologies'

3 Findings

3.1 Distribution of documents by years

At this stage of the research, the distribution of documents between the years 1978 and 2020 was examined. In this context, 232 studies were accessed through the Scopus database, and their distribution is presented in Table 1.

Table 1. Distribution of documents by years

Years	Frequency
2020	5
2019	20
2018	10
2017	16
2016	13
2015	9
2014	15
2013	21
2012	5
2011	17
2010	13
2009	13
2008	9
2007	6
2006	8
2005	10
2004	4
2003	7
2002	3
2001	3
2000	4

When the studies on educational technology and instructional technologies were examined, it was found that the first study was conducted in 1978. Table 1 includes the studies from 2020 to 2000. There are three studies in 1999, two studies in 1998, four studies in 1996, one study in 1995, one study in 1994, two studies in 1993, one

study in 1992, one study in 1991, one study in 1989 and two studies in 1986 and 1985. It was found that only one study was conducted in 2003, one study in 1983 and one study in 1978.

3.2 Distribution of documents by subject areas

Table 2. Distribution of documents by subject areas

Subject area	f
Social Sciences	184
Computer Science	64
Psychology	20
Engineering	17
Medicine	17
Nursing	13
Arts and Humanities	9
Business, Management and Accounting	7
Health Professions	7
Agricultural and Biological Sciences	6
Mathematics	6
Biochemistry, Genetics and Molecular Biology	4
Dentistry	4
Veterinary	4
Decision Sciences	2
Environmental Science	2
Pharmacology, Toxicology and Pharmaceutics	2
Chemistry	1
Economics, Econometrics and Finance	1
Multidisciplinary	1
Neuroscience	1

When the articles in the Scopus database were examined, it was seen that most articles in the field of educational technologies were done in the field of Social Sciences (184). 64 articles were published in the field of Computer Science. One study was conducted in the field of Chemistry (1), Economics (1), Econometrics and Finance Multidisciplinary (1) and Neuroscience (1).

If we look at the findings regarding the types of articles published in the Scopus database, it can be seen that most of the studies were published in the article type; 29 papers were published as conference papers, 21 papers as review, 16 papers as book chapters, 6 papers as book, 2 papers as short survey, 1 paper as conference review and, finally, 1 paper as editorial

3.3 Distribution of documents by document types

Table 3. Distribution of documents by document types

Document type	f
Article	156
Conference paper	29
Review	21
Book chapter	16
Book	6
Short survey	2
Conference review	1
Editorial	1

3.4 Source title by Scopus index

Table 4. Source title by Scopus index

Source title	f
Turkish Online Journal of Educational Technology	26
Educational Technology and Society	8
ETR & D	8
Procedia Social and Behavioural Sciences	6
Techtrends	6
Computers in the Schools	5
American Annals of the Deaf	4
International Journal of Information and Communication Technology Education	4
Journal of Computing in Higher Education	4
Journal of Dental Education	4
Journal of Veterinary Medical Education	4
British Journal of Educational Technology	3
Computers Informatics Nursing	3
Computers and Education	3
Education and Information Technologies	3
Handbook of Research on Educational Communications and Technology Fourth Edition	3
Journal of Research on Technology in Education	3
Journal of Science Education and Technology	3
AI and Society	2
American Journal of Pharmaceutical Education	2

When we looked at the analysis of the articles on educational technology and instructional technology published in the Scopus database, it was seen that most of the studies were published in the 'Turkish Online Journal of Educational Technology' (26). There are eight articles published in the Educational Technology and Society and ETR & D journals, respectively.

3.5 Distribution of documents by author's country

Table 5. Distribution of documents by author's country

Affiliation	f
United States	145
Turkey	44
Canada	7
Australia	3
Cyprus	3
Singapore	3
Spain	3
United Arab Emirates	3
Brazil	2
China	2
Fiji	2
Germany	2
Israel	2
Norway	2
South Korea	2
Taiwan	2
United Kingdom	2
Chile	1
Croatia	1
France	1
Ghana	1
India	1
Iran	1
Italy	1
Jordan	1
Macao	1
Malaysia	1
Mexico	1
Philippines	1
Slovakia	1
South Africa	1
Sweden	1
Tunisia	1
Zimbabwe	1
Undefined	6

When looking at the countries of the authors of the articles published in the Scopus database, it was found that the most studies were conducted in United States (145), Turkey (44), Canada (7), Australia (3) respectively. When looking at the studies published in Scope, the countries of the authors of six studies were not specified.

4 Conclusion and Discussion

When studies on educational technology and instructional technologies were examined, it was concluded that the first study was conducted in 1978. It was also concluded that most of the studies were done in 2019. Three studies in 1999, two studies in 1998, four studies in 1996, one study in 1995, one study in 1994, two studies in 1993, one study in 1992, one study in 1991 and one study in 1989. The study concluded that two studies were conducted in 1986, one study in 1983 and one study in 1978. When the results of the findings were examined, it can be said that the number of researches is pleasing. The rapid development in technology, in the field of education has increased the studies in this field in recent years.

When the articles on educational technology and instructional technology were examined in the Scopus database, it was seen that most of the articles were in the field of Social Sciences (184). 64 articles were published in the field of Computer Science. It was also concluded that studies were conducted in the fields of Chemistry (1), Economics (1), Econometrics and Finance, Multidisciplinary (1) and Neuroscience (1). This situation can be explained by the fact that the field of social sciences is related to education. In the literature, the issue of using computers in educational technologies and in educational environments is mostly discussed [5,6,11,9,17,23,27,28].

If we look at the analysis of the articles on educational technology and instructional technology published in the Scopus database, it can be seen that most of the studies were published in the 'Turkish Online Journal of Educational Technology' (26). There are 8 articles published in Educational Technology and Society and ETR & D journals, respectively. This result is consistent with the results in the fields of Social Sciences and Computer Science.

It was observed that studies on educational technologies and instructional technologies were mostly published as articles. 29 papers were conference papers, 21 papers were compilations, 16 were book chapters, 6 were books, 2 papers were short questionnaires, 1 paper was a conference review and, finally, 1 paper was an editorial.

When the countries of the authors of the articles published in the Scopus database were examined, most of them were from the USA (145), followed by Turkey (44), Canada (7) and Australia (3). The countries of the authors of six studies are unclear. They may be from unrecognised countries. It is not surprising that USA, one of the leading developed countries, has the most studies. However, further studies are expected from other countries.

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