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An Analysis on Research Trends of Distance Education

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Abstract

The term “Distance Education” (hereafter DE) is gaining popularity amid new global trends in cross-cultural studies of transnational education. The main objective of this article is to identify the academic research development and future research goals in the Distance Education domain using the Scopus database in the last decade (2012–2022). To this end, a bibliometric analysis was performed examining the distribution of publications, the most influential scientific publication venues, the most productive authors, and regions and concluding with an explanation of the keywords co-occurrence in line with the VOSviewer program. The outcomes revealed that the most frequently examined topics in the field of DE can be detected, which focused on distance learning, online teaching, online education, moocs, ICT, and constitute subgenres of the literature under consideration. All in all, the paper can help scholars understand and decipher current trends, keep up with DE research directions, and finally enable them to conduct their future research more effectively.

Keywords: Distance Education, Bibliometric Analysis, Review, Research Evaluation, VOSviewer

Introduction

Online teaching is already being used in education learning environments around the world for teacher development and training, to meet the needs of entering the profession, and for their lifelong learning. Teleconferencing can be

the most appropriate tool for updating knowledge, acquiring professional skills, and modernizing teaching methods, according to new scientific techniques for organized, qualitative, scientifically consistent, and continuous teacher training (Armakolas, Panagiotakopoulos, Karatrantou, 2022). According to the literature review, a variety of technological, pedagogical, psychological, and social factors influence the teleconferencing environment. The effectiveness of a teleconferencing session mainly depends on the “lesson plan” and the teacher’s coordination of collaborative/interactive activities and communication (Alqurashi, 2017; Taskiran, 2020). However, in terms of variables that significantly influence the effectiveness, privacy preference in online communication and procrastination tendency was identified as relevant. In light of this, the need for appropriate pedagogical design and thorough research in distance learning is imperative (Kohout et al., 2022).

Literature Review

In recent years, several studies have been conducted to examine the evolution process of DE and address new research directions. One of the first surveys was performed by Berge and Mrozowski (2001), who reviewed the scientific literature on DE for a decade (1990–1999). Lee, Driscoll and Nelson (2004) dealt with issues related to DE, and compiled studies published in the following four journals: “the American Journal of Distance Education” (AJDE), “the Journal of Distance Education” (JDE), “Distance Education” (DE) and “Open Learning: The Journal of Open, Distance and e-Learning” (OL). Zawacki-Richter has explored the DE research field in depth by conducting a considerable number of studies. In his first scientific attempt, Zawacki-Richter (2009) applied the Delphi method to classify the research directions. The second study (Zawacki-Richter, Bäcker, Vogt, 2009), analyzed 695 documents published in five leading German journals between 2000 and 2008 to uncover research gaps. In the third study, Zawacki-Richter and Von Prümmer explored the interrelationships between gender, collaboration, and research methods in DE (Zawacki-Richter, von Prümmer, 2010).

Bozkurt et al. (2015) examined trends in distance education research from 2009 to 2013, using an in-depth analysis of seven peer-reviewed scholarly journals. Amoozegar Khodabandelou nad Ale Ebrahim (2018) processed the data they extracted from the Web of Science platform (WoS) to determine current trends in distance education research for the period 1980 to 2016. Literature review and social network analysis were used primarily to examine the structure and patterns of information sharing in distance education research and to interpret the associations between keywords mentioned in the articles. An aggregate of 500 of the most cited papers was examined to probe the influence of factors such as journal DOI number and keywords according to the number of reports they got.

Hebecci (2021) carried out a bibliometric study using WoS to determine trends in scholarly research on DE during the outbreak of COVID-19 crisis and to suggest guidelines for further analysis on this topic. Following the filtering process of WoS, 767 scholarly articles were included in the study. Data analysis encompassed all the articles by year, country, journal, publication language, citation, co-author, co-occurrence, and co-citation. The study showed that the articles were published within a short span of two years (2020–2021), and were mainly written in English. The majority of the articles were published in the “Journal of Chemical Education”. Also, this journal emerged as the most frequently cited and co-cited.

According to the literature, during the period of the COVID-19 lockdowns, studies on the bibliometric analysis of DE decreased significantly (Karakose, Demirkol, 2021; Sweileh, 2021; Yavuz, Kayali, Tatal, 2021). A study by Aggarwal, Aggarwal, Robles, Depasquale and Auseon (2020), which analyzed 3,641 documents, found that the proportion of educational research was less than 1%. Given the impact of the COVID-19 outbreak on education, it is critical to increase the quality and quantity of studies in this area to contribute to future literature and academic research.

In this study, a bibliometric analysis was performed to demonstrate the development path of DE philosophy and to trace the transfer of research directions, and seek new uncharted research opportunities, as this topic is becoming increasingly important. Questions to be addressed are as follows:

Question 1: How is research on DE evolving by the number of publications per year?

Question 2: In which journals have the most articles on DE been published?

Question 3: Which authors have contributed most to the publication of DE research results?

Question 4: Which author’s countries contribute most to the publication of DE? Question 5: What are the key areas of research on DE?

Question 6: What are the limitations of current research?

To answer the above questions, the study was divided into five parts. Sections 1 and 2 introduce the concept of DE and argues the significance of understanding recent trend and the development of DE research. Section 3 describes the research methodology used for data extraction and preparation. The bibliometric analysis and results are interpreted in section 4, while section 5 summarizes the findings and confirms the limitations of this work.

Research Methodology

1. Method

To gain a thorough understanding of the research landscape in DE, this article employs bibliometric analysis. Alongside, it uses the VOSviewer application

(van Eck, Waltman, 2020) to analyze and visualize the dataset, and attain the research objectives, following similar methods employed in other articles (Das, 2021; Ghani et al., 2022; Prahani et al., 2022).

2. Selection of data

It is very often observed that scholars when they want to conduct a bibliometric review use one of the three platforms: Scopus (Elsevier), Web of Science (Thomson), and Google Scholar (Google). The Scopus database was used to search the scientific literature from the perspective of DE. This database offers many advantages over WoS, such as a wide range of papers and faster citation analysis (Joshi, 2016). It also allows easy data export without manual intervention and covers several business, financial, and management documents (Aksnes, Sivertsen, 2019). On the day of analysis January 5, 2022, the search term “Distance Education” [TITLE-ABS-KEY] contained 23,488 documents. The search was further refined using the following limitations. To ensure quality, only articles published in journals were included. Also, English-language documents within the field of “social sciences” were considered for a better understanding of the researchers. The period was limited to the last decade (2012–2022), and all open-access articles were added too.

After the extraction and cleaning process of the data, the final sample included 954 articles which was extracted in CSV format and imported into VOSviewer for more elaboration. Table 1 tabulates the research process.

Table 1. Data extraction & cleaning process

| Data Query | Data Filtering | Data Export |
|---|---|--------------------|
| 1. Scopus | 4. Subject Area: “Social Science” | 10. Article data |
| 2. Title, Abstract, Keyword: “Distance Education” | 5. Document Type: Articles | 11. Author data |
| 3. Result: 23,488 documents | 6. Language: English | 12. Keywords |
| | 7. Timespan:2012-2022 | 13. Citations |
| | 8. Source: Journals | 14. References |
| | 9. Results: 954 documents for bibliometric analysis | 15. CSV Excel file |
| | | 16. VOSviewer |

Source: Authors computation.

3. Results and Discussion

3.1. Publication trend – Q1

Figure 2 displays the large academic interest in distance education as it has been shaped in the decade we are interested in. An overall increasing trend can be observed, especially from 2018 onwards. It is interesting to note that the highest production of articles occurred in 2022, demonstrating a surge in research activity. Specifically, the number of articles published in the first three years of the 2020s is

almost half the number of articles published in all previous years. The research trend in terms of the number of publications continues to develop. The data of the above figure reveals that DE as a subject of study is an expanding field that is constantly changing and gaining the attention of scholars. The upward trend of publications reflects the increasing efforts to comprehend different aspects of DE in order to meet the evolving needs of both educators and learners.

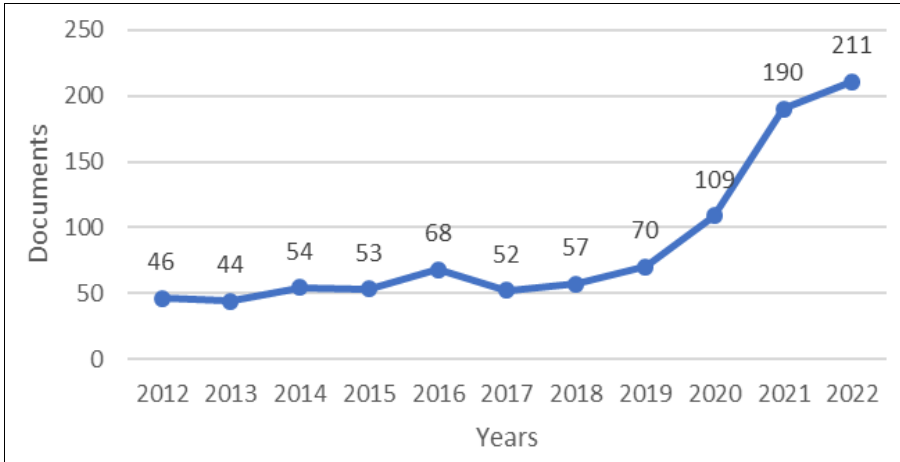


Figure 1. The annual scientific production of publications on DE

Source: Prepared by authors based on VOSviewer.

3.2. Most Productive and Influential Journals – Q2

Table 2 tabulates the top ten peer-reviewed journals with the most publications in DE research. Regarding contributing journals, the journal with the highest productivity is the “Turkish Online Journal of Distance Education” (TOJDE), with 101 articles published by Anadolu University.

Table 2. Ten Most Productive and Influential Journals

| Sources | Documents | Citations |
|--|-----------|-----------|
| Turkish Online Journal of Distance Education | 101 | 612 |
| International Journal of Emerging Technologies in Learning | 97 | 408 |
| International Review of Research in Open and Distance Learning | 81 | 1,867 |
| World Journal on Educational Technology: current issues | 30 | 47 |
| Online Learning Journal | 25 | 294 |
| IEEE Transactions on Learning Technologies | 21 | 769 |
| Computers and Education | 20 | 1,762 |
| Cypriot Journal of Educational Sciences | 19 | 12 |
| Sustainability (Switzerland) | 18 | 53 |
| Education and Information Technologies | 16 | 208 |

Source: Prepared by authors based on VOSviewer.

In second place is the “International Journal of Emerging Technologies in Learning” (iJET) with 97 articles. “International Review of Research in Open and Distance Learning” (IRRODL) is third in line but excels in terms of citations. Also, “Computers and Education” (C&E) journal occupies the second place as it has received a high rate of citations for its published articles.

The bibliometric method can serve as a tool that facilitates authors to select journals for possible publication of their articles. The presence of IRRODL and C&E in the top ranking suggests that both journals provide a combination of productivity and quality, making them a right choice for scholars seeking to contribute to DE literature and obtain visibility for their article.

3.3. Most Productive and Cited Authors – Q3

This section presents the top ten authors who contributed the most to DE literature. Using the publications as a proxy for productivity, the most active and prominent authors are listed in Figure 2 and meticulously in Table 3.

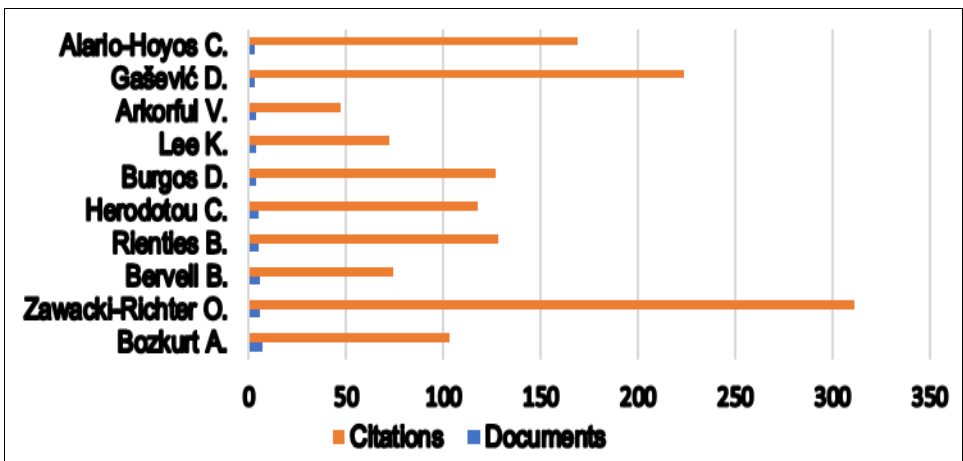


Figure 2. Ten most productive authors and their citations

Source: Prepared by authors based on VOSviewer.

A perusal of this table reveals that Bozkurt A. has seven articles in his credit, proving that he is the most prolific author. His scientific work revolves around identifying and mapping patterns in research on MOOCs. One of his distinguished articles is “What Research Says About MOOCs – An Explorative Content Analysis” (Zawacki-Richter, Bozkurt, Alturki, Aldraiweesh, 2018), and was published in the “International Review of Research in Open and Distributed Learning” in 2018. It is worth noting that in a short span of three years, this paper garnered significant attention.

Table 3. Number of Publications and Citations by Author

| Rank | Author | Documents | Citations |
|------|--------------------|-----------|-----------|
| 1 | Bozkurt A. | 7 | 103 |
| 2 | Zawacki-Richter O. | 6 | 311 |
| 3 | Bervell B. | 6 | 74 |
| 4 | Rienties B. | 5 | 128 |
| 5 | Herodotou C. | 5 | 118 |
| 6 | Burgos D. | 4 | 127 |
| 7 | Lee K. | 4 | 72 |
| 8 | Arkorful V. | 4 | 47 |
| 9 | Gašević D. | 3 | 224 |
| 10 | Alario-Hoyos C. | 3 | 169 |

Source: Prepared by authors based on VOSviewer.

The second influential and well-known author is Zawacki-Richter O. with a record of six related publications and 311 citations. His paper “Mapping research trends from 35 years of publications in Distance Education” (Zawacki-Richter, Naidu, 2016) published in the “Distance Education” journal in 2016. In terms of citation, Scopus classifies this paper in the first place as it has been cited 95 times. He has focused his research on mapping out trends in distance education research and scholarship over a significant period (1980–2014). These results show that both the above authors are having high recognition in the academic field. Many other scholars often rely on their publications as a foundation for elaborating their own scientific work.

Among the authors who have written about DE, Gašević and Alario-Hoyos. have published three papers each and were cited 224 and 169 times, respectively. Bervell published six documents and received 74 citations. This suggests that while productivity plays an important role, it is not correlated with influence.

3.4. The most contributing countries – Q4

In this section, we identify the productivity and influence of different countries in terms of the number of documents and citations, providing information on the geographical distribution of the research we are interested in. Out of the 103 countries around the globe that have demonstrated high influence and productivity in the field of DE research, the top 10 are depicted in Table 4.

The list includes both developed and developing countries. The United States leads the list in publications and follows closely behind Turkey, the United Kingdom, China, and Russian Federation, indicating their active presence in DE literature. The result of a combined analysis of the number of documents and the citation per document are impressive. It highlights that among these ten nations, the UK, Australia, and Spain stand out particularly active and exhibit great influence. Although these three countries have a lower productivity compared to other countries, their scientific papers are frequently cited, showcasing strong impact and better quality. It is worth noting that dynamic productivity may not

The network visualization in Figure 3, presents that the first cluster in green, focusing on DE, becomes the main research topic of this study, evident by its big dot on the picture. Moreover, every cluster in the map corresponds to a specific scientific area. For example, the second cluster (red) shows distance learning and online education as its main topics, representing the largest constituency of this group. The third cluster (blue) is centered on online teaching and ICT. The fourth group (yellow) revolves around e-learning/online learning and moocs. Topics in cluster five (purple) focused primarily on teacher education and COVID-19. There are two more themes: one in light blue related to higher education and one in orange related to computer-mediated communication, which are subgenres within literature.

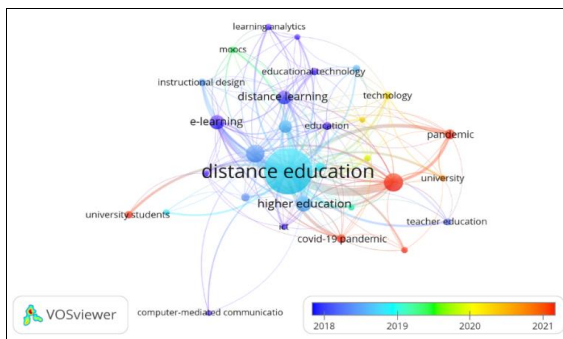


Figure 4. Overlay Visualization of Scopus database

Source: VOSviewer.

Figure 4 provides a closer look at research on DE conducted over a ten-year period. The above picture illustrates that the highest occurrence of keywords appeared from 2018 until 2021. Research topics such as technology, COVID-19, and pedagogy were relatively new (around 2021) compared to other topics like distance education and ICT which began to attract research interest in about 2018. It is clear that both Figure 3 and Figure 4 offer useful insights and temporal trends in the field under investigation.

3.6 Future Topics in the Field of DE – Q6

Figure 5 shows a density visualization created by VOSviewer, which captures the depth of research conducted in specific fields of DE. The following map illustrates the density of the topics by representing keywords in different colors based on their frequency. More intense and bright colors indicate an advanced number of academic papers on a particular keyword. Therefore, keywords with a less frequent occurrence are represented by a blurred color, which means limited research in those areas, signaling the need for more exploration. Such keywords could serve as potential research subjects.

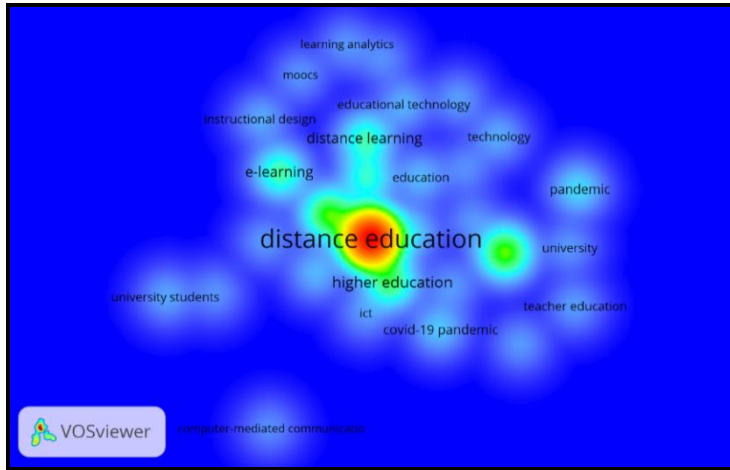


Figure 5. Density visualizations of Scopus database

Source: VOSviewer.

Some other examples of these keywords are learning analytics, educational technology, ICT, and computer-mediated communication. By identifying these emerging themes, scientific researchers can contribute to the area of DE studies and make new advances.

Conclusion

This paper uses bibliometric analysis to screen all literature in the Scopus platform in the distance education scientific field. The literature on distance education has grown gradually, as evidenced by the number of publications in recent years. According to the results, up to 954 records were pulled from the Scopus database in the initial phase. Also, the findings of this study show the trends in DE studies, publishers, contributors, and countries. An analysis of less common keywords outlines some promising areas for future research. Therefore, this study aimed to identify research developments and predict potential advances in future research through bibliometric tools as field research in the DE has increased significantly. The VOSviewer application has been successfully demonstrated in the mapping and visualizing bibliometric data. A limitation of this study is that the records are gathered only from the Scopus database, specifically journals as resources and articles published in the English language. It is therefore recommended to use a range of various electronic platforms (e.g. Web of Science, Springer, IEEE Xplore, Google Scholar) to ensure in-depth coverage of the survey. Additionally, it is advisable to obtain data from varied periods, as this can yield diverse findings and lead to a nuanced understanding of the subject.

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