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Bibliometric analysis of open and distance learning research in Türkiye: WoS articles (2020-2024)

Hanife Çivril [a] *, Emine Aruğaslan [a]

[a] Isparta University of Applied Sciences, Türkiye.

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Highlights

- Conducted a bibliometric analysis of articles on open and distance learning (2020-2024), focusing on those affiliated with institutions or authors in Türkiye.
- "Distance education," "online learning," and "COVID-19" emerged as the most frequently used keywords, highlighting the shift toward digital education during the pandemic.
- Aras Bozkurt was identified as the most prolific author, with extensive collaborations both regionally and internationally.
- Anadolu University played a central role in research contributions, particularly through its Open Education Faculty and academic programs.
- The number of articles published on open and distance learning in Türkiye increased significantly between 2020 and 2024, reflecting a global trend.

Abstract

The purpose of this study is to conduct a bibliometric analysis of research on open and distance learning, focusing on articles affiliated with institutions or authors in Türkiye. Articles were retrieved from the Web of Science (WoS) database, those indexed in the SSCI, SCIE, and ESCI categories, published between 2020 and 2024. A total of 1,229 articles were identified through this search. VOSviewer software was used to analyze the distribution of publications by year, keyword co-occurrence, co-authorship networks, co-citation, and citation patterns of journals. The findings indicate that "distance education" and "COVID-19" were the most frequently occurring keywords, reflecting the increasing shift to digital education during the pandemic. Bozkurt A. was the most prolific author, with extensive collaboration in national and international publications. Among institutions, Anadolu University stood out as the leading contributor, reflecting its central role in the development of distance education in Türkiye. Additionally, there was a significant increase in research output during the 2020-2024 period, mirroring global trends in the field.

Article Info: Research Article

Keywords: *Open and distance learning, bibliometric analysis, Web of Science, Türkiye*

1. Introduction

Developments in the field of open and distance learning have gained momentum with the advancement of digital technologies and the enhancement of technological infrastructures. The digital transformation of education has offered students learning opportunities not only within the classroom but also irrespective of time and place, leading to significant changes in educational systems (Bitar & Davidovich, 2024). Online

* Corresponding author. Distance Education Vocational School, Isparta University of Applied Sciences, Türkiye.
e-mail address: hanifecivril@isparta.edu.tr

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platforms have facilitated access to learning materials, and interactive learning environments have supported students' learning experiences at their own pace. With the increased adoption of educational technologies, distance learning models have been implemented at various levels of education, particularly in higher education (Garlinska et al., 2023). The sudden and global impact of the COVID-19 pandemic in 2020 made the transition to a distance education model a necessity, rapidly accelerating the use of digital learning tools worldwide (Ali, 2020; Pelikan et al., 2021). During the pandemic, many universities and schools began providing education through digital platforms, positioning distance learning as a crucial component of global education systems (Sato et al., 2023; Yaban & Gaschler, 2024). Consequently, distance education has evolved into a sustainable and accessible learning model, not only as an alternative but also as a permanent feature of modern education.

The development of distance learning in Türkiye can be viewed as a reflection of the significant transformations observed in this field globally. Distance education, which has a history spanning three centuries, has been part of Türkiye's education policies since 1923. However, practical implementations began in the 1970s, with limited distance education initiatives introduced at the secondary school level. The establishment of Anadolu University's Open Education Faculty in the 1980s marked a pivotal moment in transferring distance education to higher education in Türkiye. This faculty quickly reached a large student population, expanding access to educational opportunities through the distance education model (Bozkurt, 2017). Given Türkiye's socio-economic structure, this model became particularly appealing to individuals in rural areas or those unable to participate in formal education for various reasons. Anadolu University's success accelerated the adoption of distance education in Türkiye and contributed to the widespread implementation of this model (Ozkul, 2001).

In line with these developments, academic studies in the field of open and distance learning have diversified and begun to focus on specific focal points. Notably, student achievement, learning processes, and the impact of digital education tools have become central themes of research in this field. The literature highlights review studies examining topics such as academic performance (Broadbent & Poon, 2015; Kauffman, 2015), motivation (Mohtar & Md Yunus, 2022; Ertan & Kocadere, 2022), self-regulated learning (Eggers et al., 2021; Lee et al., 2019), student engagement (Nkomo et al., 2021), interaction and communication (Wanstreet, 2006), and learning styles and satisfaction (Khamparia & Pandey, 2020). Additionally, innovative teaching methods such as flipped classroom (Schmid et al., 2023) and gamification (Al-Hafdi & Alhalafawy, 2024; Antonaci et al., 2019) have emerged as frequently discussed topics. Moreover, the necessities introduced by the pandemic and the rapid adoption of digital technologies have ushered in a new era in education. The COVID-19 pandemic facilitated the rapid integration of digital technologies into education, and during this period, topics such as emergency distance education and Massive Open Online Courses (MOOCs) garnered significant attention (Bozkurt et al., 2021).

As part of this technological transformation, artificial intelligence-based technologies are making innovative contributions to distance learning processes. While artificial intelligence, particularly machine learning and deep learning, introduces novel approaches to distance learning, mobile learning (Koole et al., 2010; Weng et al., 2024) and virtual reality applications (Almusfar, 2024; Yilmaz et al., 2016) also contribute significantly to education. These technologies provide students with diverse learning experiences, particularly in applied disciplines such as health sciences, engineering, architecture, and education sciences. Through simulation-based training and case studies, students are able to transform their theoretical knowledge into practical skills and experience real-life situations within virtual environments. Additionally, the role of distance education in promoting equal opportunities and addressing its socioeconomic impact are critical elements to consider. These effects enhance access to educational opportunities, especially for disadvantaged groups, and play a vital role in providing professional qualifications while offering a flexible and secure learning environment (Gunawardena & McIsaac, 2013).

1.1. Research Reviews and Bibliometric Studies in Open and Distance Learning

Bibliometric analysis is a method that provides a macroscopic overview of the academic literature in a particular research field, identifying key concepts and analyzing common research themes (Van Nunen et al., 2018). This method not only highlights these research topics but also serves as a strategic guide for

future research directions (Passas, 2024). Bibliometric analyses reveal which studies are most frequently cited and which journals are most influential, making the academic network in the field more transparent. Well-executed bibliometric analyses offer a robust foundation for advancing a field in meaningful ways by (1) providing an overview, (2) helping to identify knowledge gaps, (3) facilitating the development of new research ideas, and (4) supporting scholars in positioning and strengthening their contributions to the field (Donthu et al., 2021). With the availability of scientific databases such as Scopus and Web of Science (WoS), access to vast volumes of bibliometric data has become relatively easier (AlRyalat et al., 2019; Caputo & Kargina, 2022; Singh et al., 2021). Bibliometric software, including Gephi, Leximancer, and VOSviewer, has enabled researchers to analyze these data in a pragmatic manner, which has led to growing academic interest in bibliometric analysis in recent years (Donthu et al., 2021). In this context, research in open and distance learning is being examined more thoroughly through bibliometric analysis.

Studies analyzing general trends in open and distance learning reveal the fundamental structure of publications in the field of distance education, along with author and journal interactions, as well as conceptual and social structures (Alqoot, 2023; Amoozegar et al., 2018; Hebebci, 2021; Karagözoğlu et al., 2024; Yıldız & Kılıç Çakmak, 2024). Additionally, there are bibliographic reviews focused on approaches in distance education, such as student interaction, student-centeredness, and support systems (Açıkgöz & Zetter, 2023; Ayan et al., 2023; Çınar et al., 2024). While research in distance education increased during the pandemic, subfields such as e-learning and online assessment have also been examined in depth through bibliographic studies (Bakac, 2021; Doo et al., 2023). Furthermore, analyses comparing open access and closed access journals in distance education have explored their impact levels and perceived value (Zawacki-Richter et al., 2010). The literature also includes bibliographic analyses on various topics, including e-learning (Djeki et al., 2022; Sobral, 2021), virtual reality (Rojas-Sánchez et al., 2023), virtual laboratories (Heradio et al., 2016), quality assurance in distance education (Tonbuloğlu, 2011), measurement and evaluation (Sudakova et al., 2022), and MOOCs (Wahid et al., 2020).

When examining studies originating from Türkiye in the field of open and distance learning, it is evident that fewer bibliometric analyses have been conducted compared to those at the global level. Within the scope of general distance education research, theses on distance education (Özmen & Kan, 2021) and articles originating from Türkiye (Ergün & Ergün, 2024) have been analyzed. In the context of the COVID-19 pandemic, studies on distance education during this period were examined (Özenoğlu & Baltacı, 2022), and bibliometric analyses were also conducted on augmented reality (Altınpulluk, 2018) and online learning videos (Yıldırım et al., 2023) under the theme of technology and education. The data used in the bibliometric analyses of studies on open and distance learning from Türkiye were collected from the YÖK National Thesis Center (Altınpulluk, 2018; Özmen & Kan, 2021) and the Scopus (Ergün & Ergün, 2024; Özenoğlu & Baltacı, 2022; Yıldırım et al., 2023) databases.

1.2. The Purpose of the Study and Research Questions

The field of open and distance learning has undergone significant transformation in recent years, driven by technological advancements and evolving educational needs. This transformation has highlighted the need for a comprehensive synthesis of research to understand current trends, identify knowledge gaps, and guide future developments. In particular, the COVID-19 pandemic has significantly increased interest and research efforts in this field on both global and national levels, underscoring the necessity of thoroughly examining studies conducted during this period. Although there has been a rise in global studies examining various aspects of distance education, significant gaps remain in understanding the regional contributions of countries like Türkiye. While Türkiye has made substantial contributions to distance education research, no systematic bibliometric analysis focusing on high-impact, peer-reviewed studies from the region has been identified in the literature.

The significance of this research stands out in several key aspects. First, it focuses on the period of 2020–2024, a time marked by the rapid transformation of distance education and the profound effects of the global COVID-19 pandemic. This period represents a critical phase of substantial change in educational practices. Additionally, by examining publications indexed in WoS, this study offers valuable insights into the academic quality and research trends in the field through high-quality, peer-reviewed studies. Another

important aspect of this analysis is its aim to explore Türkiye's contributions to the global discourse on distance education, thereby addressing a significant gap in understanding regional research dynamics. Through these aspects, the study provides meaningful perspectives at both national and international levels.

The purpose of this study is to conduct a bibliometric analysis of articles (including research articles and reviews) indexed in the WoS (SSCI, SCIE, and ESCI) databases in the field of open and distance learning originating from Türkiye between 2020 and 2024. This analysis aims to identify research trends in open and distance learning, highlight the most prolific authors, examine the most frequently used keywords, and provide a comprehensive understanding of the general structure of studies in the field. Moreover, this analysis offers a critical perspective on Türkiye's contributions to global academic discussions on distance education, evaluating regional academic productivity and its alignment with international trends. In line with these objectives, the following research questions will be addressed:In line with these objectives, the following research questions will be addressed:

1. What is the annual distribution of articles on open and distance learning, focusing on those affiliated with institutions or authors in Türkiye, from 2020 to 2024?
2. Which key themes and topics have emerged in open and distance learning research, based on a keyword co-occurrence analysis?
3. What are the patterns of collaboration among authors in open and distance learning research as revealed by the co-authorship network analysis?
4. Which authors are most frequently co-cited in open and distance learning research?
5. Which journals are most frequently cited in open and distance learning research?
6. What are the patterns of institutional collaboration in open and distance learning research as revealed by the co-authorship network analysis of organizations?

2. Methodology

2.1. Research Design

This study employed a bibliometric analysis following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to investigate trends and patterns in research on open and distance learning, focusing on articles affiliated with Türkiye between 2020 and 2024. Data were collected from the WoS database. Bibliometric analysis is a widely adopted quantitative method for assessing the impact, development, and structure of scientific publications within a specific research field. In this study, VOSviewer was employed for network analysis, allowing for the visualization of relationships between key terms, authors, citiations, and organizations.

2.2. Data Collection

The data for this study were obtained from the WoS, a leading academic database that indexes high-quality research across various disciplines. WoS includes several citation indexes, such as the Science Citation Index (SCI), Social Sciences Citation Index (SSCI), and Emerging Sources Citation Index (ESCI), which provide comprehensive bibliometric data for analyzing scientific output.

The search was performed on October 22, 2024, using the following query:

> TS= ("open education" OR "distance education" OR "online learning" OR "remote learning" OR "e-learning" OR "blended learning" OR "digital education" OR "virtual learning environments" OR "MOOCs" OR "online teaching" OR "distance learning" OR "open and distance learning" OR "open education resources") AND CU= ("Turkey" OR "Türkiye")

This query was designed to identify studies related to open and distance learning by including various terms such as "online learning," "blended learning," and "e-learning." The query also incorporated CU= ("Turkey" OR "Türkiye") to filter the search results by the country affiliation of authors or institutions, ensuring that the search results included only articles where at least one of the authors was affiliated with an institution

in Türkiye. This process resulted in a total of 2727 records being identified. The search was further refined by restricting the publication years to 2020–2024, including only articles indexed in the ESCI, SSCI, and SCI-E databases, and limiting the results to research articles and review articles. These criteria ensured that only recent, peer-reviewed, high-quality research was included in the analysis, resulting in a total of 1479 records. After excluding 19 records due to irrelevance or duplication, the search yielded a total of 1229 articles that met the specified criteria, focusing on those affiliated with institutions or authors in Türkiye. Of these, 1185 were categorized as research articles, while 44 were classified as review articles. The data selection process is summarized in the PRISMA flow diagram (Fig. 1), detailing the identification, screening, eligibility, and inclusion stages.

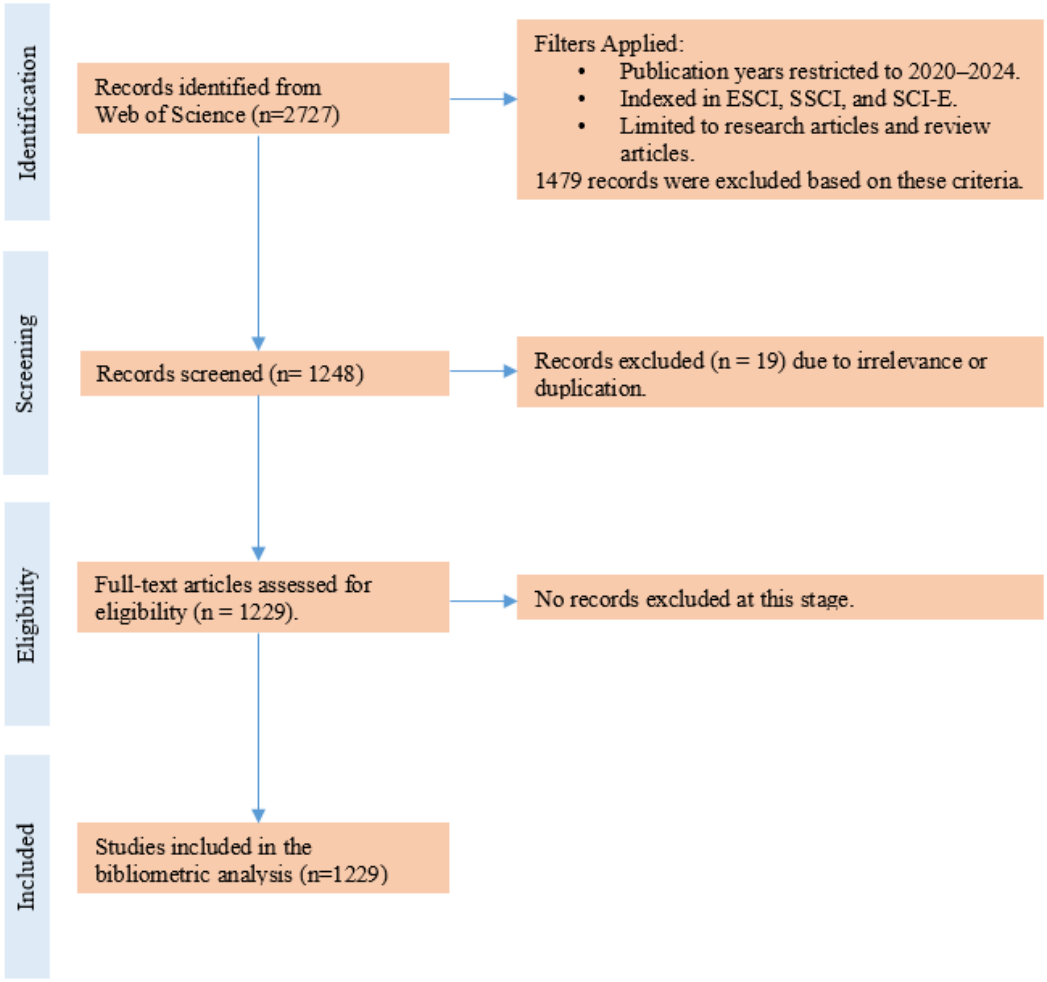

Fig. 1. PRISMA flow diagram

The metadata for the 1229 articles, including titles, authors, keywords, and citation information, were downloaded in a format compatible with VOSviewer for further analysis.

2.3. Data Analysis

The data analysis was conducted using VOSviewer software to gain a comprehensive understanding of research trends and collaborations within the field of open and distance learning in Türkiye. The analysis included multiple facets to reveal patterns and key insights across several dimensions.

First, the distribution of articles by year was examined to identify publication trends between 2020 and 2024. Next, a keyword co-occurrence analysis was performed to highlight the primary themes and topics, as revealed by the most frequently occurring terms within the dataset. A co-authorship network analysis of authors was carried out to explore collaborative relationships between individual researchers, mapping both

national and international partnerships. Additionally, a co-citation analysis was conducted to assess the foundational literature, identifying authors and publications frequently cited together, thereby showcasing influential works and prominent voices within the field. Furthermore, a citation analysis of journals was undertaken to reveal the key journals contributing to open and distance learning. Lastly, a co-authorship network analysis of organizations was conducted to examine institutional collaborations, emphasizing the role of specific organizations in fostering research partnerships and academic productivity within Türkiye and internationally.

3. Findings

3.1. Distribution of Articles by Year

The distribution of articles published between 2020 and 2024 is summarized in Table 1.

Table 1.

Distribution of articles by year (2020-2024)

Year of Publication	N	%
2024*	186	15.13%
2023	271	22.05%
2022	361	29.37%
2021	258	20.99%
2020	153	12.45%

Note: The data for 2024 includes only publications up to October 22, 2024.

According to Table 1, the year 2022 is seen having the highest number of publications, with 361 articles, accounting for 29.37% of the total. This represents a significant peak in research output. In contrast, 2020 had the fewest publications, with 153 articles (12.45% of the total). The number of publications steadily increased in 2021, reaching 258 articles (20.99%), before peaking in 2022.

In 2023, the number of articles decreased slightly to 271 (22.05%). As of October 22, 2024, 186 articles have been published, representing 15.13% of the total. Since the data for 2024 only includes publications up to October, it is possible that the final count for the year will increase by its end.

This trend suggests a notable growth in research on open and distance learning in 2022, which may be attributed to the continuing effects of the COVID-19 pandemic and the global transition to remote learning.

3.2. Keyword Co-occurrence Analysis

For the keyword analysis, the threshold for the minimum number of keyword occurrences was set to 10. Out of a total of 3052 keywords in the dataset, 58 met this threshold, ensuring that only the most frequently occurring and relevant terms were included in the analysis.

As shown in Table 2**,** the most frequently used keyword was "distance education," which appeared 306 times, reflecting its central role in the field. Other prominent keywords included "online learning" (166 occurrences), "covid-19" (164 occurrences), and "e-learning" (99 occurrences), all of which are closely related to the shift towards digital education, particularly during the COVID-19 pandemic. The prominence of pandemic-related terms such as "covid-19" and "pandemic" (49 occurrences) demonstrates the significant impact of the global health crisis on educational research during this period.

Table 2.

Most frequently occurring keywords

Keyword	Occurrences	Total Link Strength
distance education	306	351
online learning	166	189
covid-19	164	216
e-learning	99	106
distance learning	71	91
higher education	69	101
covid-19 pandemic	57	74
pandemic	49	81
online education	46	70
blended learning	44	44
motivation	31	60
education	28	38
university students	27	39
open and distance learning	26	30
online teaching	23	16
satisfaction	22	43
learning analytics	22	26
turkey	21	36
emergency remote teaching	21	31

The visual network analysis displayed in Fig. 2 provides further insights into the relationships between these keywords. "Distance education," "online learning," and "covid-19" form the core of the network, indicating that these are central themes connecting various other research areas.

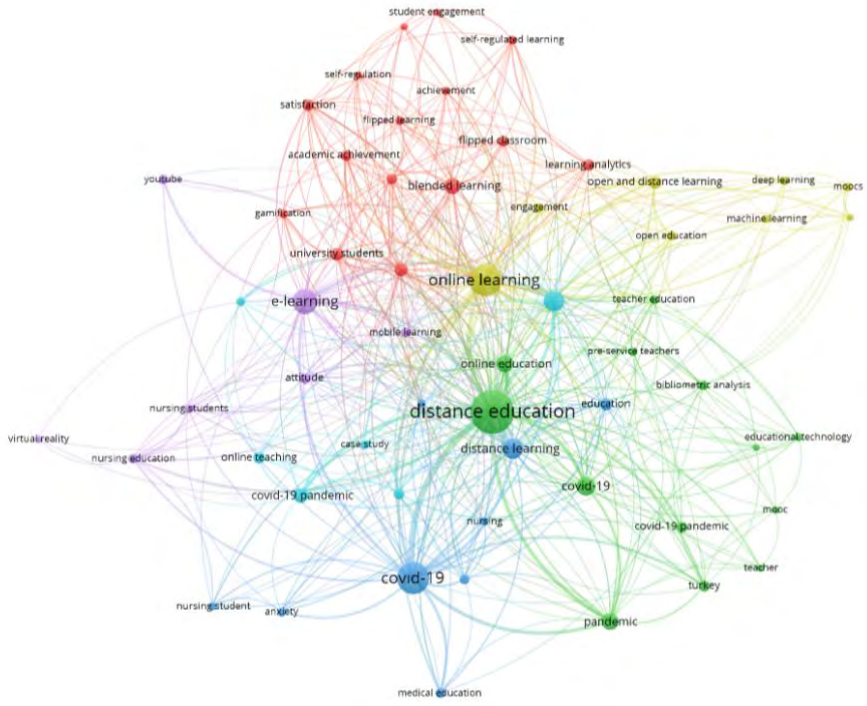

Fig. 2. Keyword co-occurrence network

Upon reviewing the initial analysis, it became evident that many of the frequently occurring keywords were directly related to the terms used in the original search query (such as distance education, online learning, e-learning, distance learning, online education, blended learning, education, open and distance learning, online teaching, and Turkey). Their prominence in the keyword co-occurrence network was expected. To gain deeper insights into emerging themes and more specific areas of research, a new analysis was conducted with these frequently occurring keywords excluded. By removing them, the analysis was able to

highlight less dominant, yet equally important topics, thus offering a more nuanced view of the research landscape in open and distance learning.

The results of this refined analysis provide a more detailed understanding of emerging research trends and niche areas within the field that were previously overshadowed by the more dominant keywords. By excluding these general terms, the analysis revealed specific themes and connections that offer valuable insights into more specialized topics, allowing for a deeper exploration of areas that may not have been as visible in the original analysis.

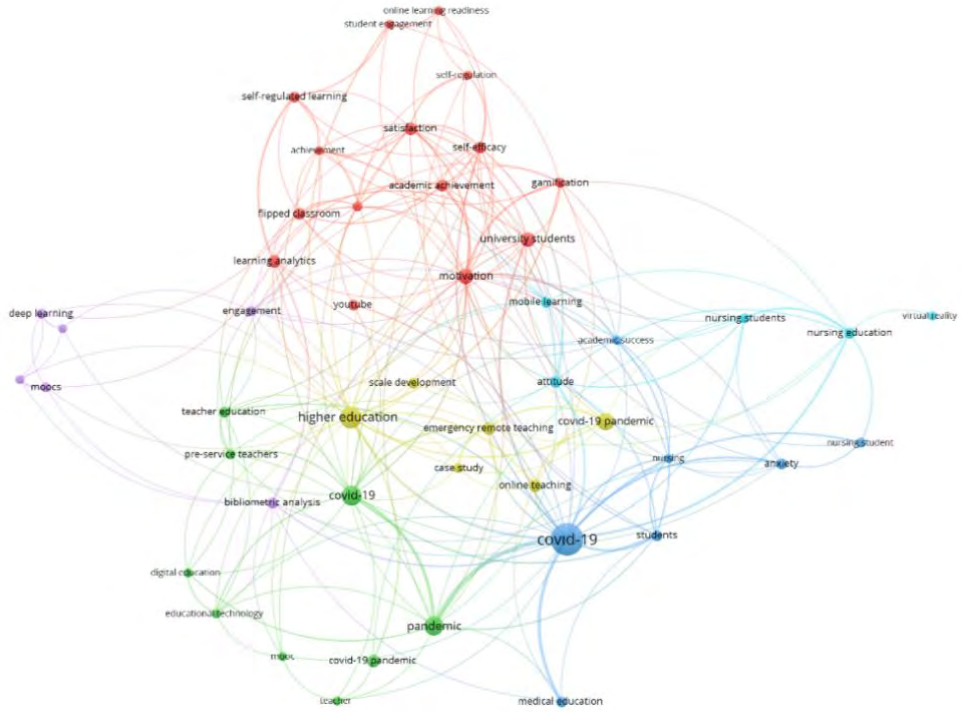

Fig. 3. Refined keyword co-occurrence network

The analysis identified six distinct clusters, as illustrated in Fig. 3, each representing a different thematic focus in the field of open and distance learning. One of the clusters emphasizes academic engagement and achievement. Keywords such as academic achievement, student engagement, motivation, self-efficacy, and self-regulated learning are prevalent, indicating a strong focus on factors influencing student success in online environments. Additionally, terms like flipped classroom and gamification highlight the increasing adoption of innovative pedagogical approaches. These keywords suggest an ongoing effort to enhance student-centered learning by incorporating elements that foster autonomy, engagement, and interactive experiences. This cluster underscores the importance of psychological and behavioral factors in the successful implementation of distance learning.

Another cluster revolves around the impact of the covid-19 on digital education. This cluster includes keywords like digital education, educational technology, and teacher education, pointing to the pandemic's role in accelerating the shift toward remote and online learning. The emergence of this cluster highlights the adaptive responses of educational systems. It demonstrates a concentrated focus on the integration of digital tools and resources to ensure instructional continuity during crises. Furthermore, the emphasis on teacher education indicates the critical role of professional development in enabling educators to navigate these challenges effectively.

A third cluster focuses on medical and nursing education, particularly during the covid-19 pandemic. Keywords such as academic success, anxiety, nursing students, and medical education suggest that this cluster explores the challenges faced by healthcare education in the context of distance learning.

Higher education and remote teaching emerge as key themes in another cluster, where keywords like higher education, online teaching, emergency remote teaching, and scale development dominate. This cluster

captures the efforts of higher education institutions in responding to the sudden shift to remote learning. The emphasis on case studies indicates that much of the research in this area documents specific instances of remote teaching during the pandemic, while scale development suggests ongoing work to measure and evaluate the effectiveness of these adaptations. This thematic focus highlights how institutions quickly adapted to unprecedented conditions and contributed to building a knowledge base through detailed documentation and evaluation of remote learning practices.

A smaller cluster centers around bibliometric analysis, with keywords such as deep learning, machine learning, and MOOCs. This cluster reflects a growing interest in the use of advanced technologies and analytical methods within education. The inclusion of terms like deep learning and machine learning signals the increasing role of artificial intelligence in shaping educational research and practices. These technologies not only provide insights through data analytics but also offer potential for innovative, scalable solutions in teaching and learning.

Finally, another cluster focuses on mobile learning, virtual reality, and nursing education. Keywords like mobile learning, virtual reality, and nursing education point to research that explores the use of immersive technologies to enhance learning experiences in fields requiring practical, hands-on training. This cluster reflects a forward-looking perspective on how technology can address the challenges of practical skills development in remote settings.

3.3. Co-authorship Network Analysis of Authors

A total of 3066 unique authors contributed to the 1229 articles included in this analysis. Table 3 lists the 10 most prolific Turkish authors, detailing the number of articles they have contributed to.

Table 3.

Most prolific authors

Authors	N	%
A. Bozkurt	28	2.28%
F. Altinay	11	0.90%
Z. Altinay	10	0.81%
H.Y. Durak	9	0.73%
R. Yilmaz	9	0.73%
G. Dagli	8	0.65%
S.S. Kozat	8	0.65%
H. Altinpulluk	7	0.57%
M. Kara	7	0.57%
S. Karaman	7	0.57%

Among the authors, A. Bozkurt stands out as the most productive, having authored or co-authored 28 articles, which accounts for 2.28% of the total publications. Following him, F. Altinay and Z. Altinay contributed to 11 (0.90%) and 10 (0.81%) articles, respectively. Other significant contributors include H.Y. Durak and R. Yilmaz, each with 9 publications (0.73%), as well as G. Dagli and S.S. Kozat with 8 articles each (0.65%). The remaining authors in the analysis have contributed fewer than 8 articles each.

For the co-authorship analysis, a minimum threshold of 3 documents per author and no minimum citation count was set in VOSviewer. Out of 3136 authors, 154 met this threshold. However, since some of the authors in this network were not connected to others, the largest connected set, consisting of 46 items, was selected to ensure a meaningful co-authorship network analysis. This approach enabled the analysis to concentrate on the most interconnected groups of authors.

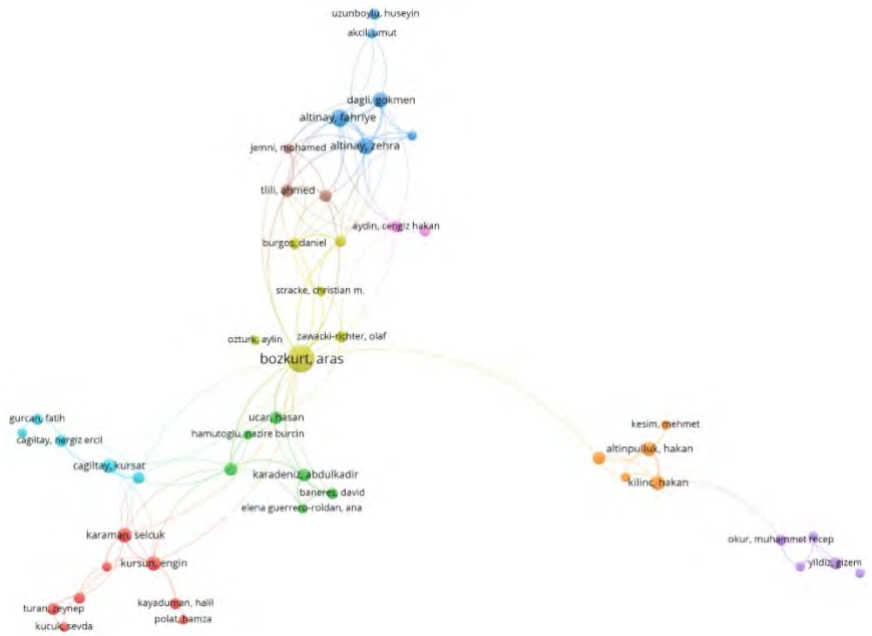

Fig. 4. Co-authorship network of authors

The co-authorship network analysis, shown in Fig. 4, resulted in the identification of 9 distinct clusters. These clusters represent groups of authors who frequently collaborate within the field of open and distance learning.

One of the most prominent authors in the network is A. Bozkurt. The analysis shows that Bozkurt A collaborates extensively with both regional and international researchers, including O. Zawacki-Richter and C.M. Stracke. This suggests that Bozkurt's work not only spans multiple institutions but also has a global reach, contributing significantly to the development and dissemination of research in open and distance learning. His position in the network reflects his influence and leadership in shaping research directions and facilitating cross-border collaborations. Other significant collaborations are observed among authors such as F. Altinay and Z. Altinay, S. Karaman and E. Kursun, as well as K. Cagiltay and N.E. Cagiltay. These collaborations reflect smaller but notable groups of researchers who frequently work together within the field of open and distance learning. In addition, H. Altinpulluk and M. Kesim are part of a collaborative network, further illustrating the existence of regional partnerships among researchers. D. Baneres and A. Karadeniz also form a cohesive group, highlighting their frequent co-authorship within this domain. Smaller collaborations, such as those between C.H. Aydin and M. Sumer, show specialized partnerships, while international collaborations like the one between R. Huang, M. Jemni, and A. Tlili reflect the global nature of co-authorships in open and distance learning.

3.4. Co-citation Analysis

The co-citation analysis was conducted with a threshold of 10 citations per author. Out of 35,846 authors, 560 met this threshold. This allowed the analysis to focus on the most frequently cited authors, revealing 6 distinct clusters of co-cited researchers within the field of open and distance learning (Fig. 5).

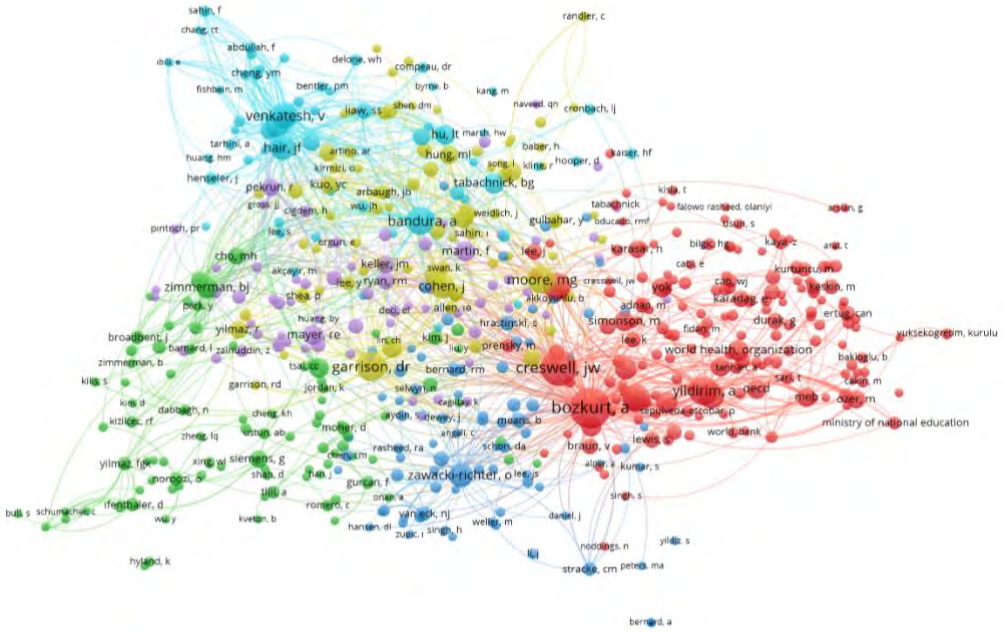

Fig. 5. Co-citation network

One of the most prominent clusters includes A. Bozkurt, whose work frequently co-occurs in citations with that of other widely referenced authors such as J.W. Creswell. While Creswell is primarily known for his contributions to research methodology and Bozkurt focuses on open and distance learning, their frequent co-citation indicates the interdisciplinary nature of the research in this field.

Another major clusters include B.J. Zimmerman and D.R. Garrison, both of whom are central figures in theoretical research, particularly around concepts like self-regulated learning and the community of inquiry framework. Their frequent co-citations emphasize the continued relevance of these foundational theories in understanding online learning environments.

In another cluster, authors such as V. Venkatesh and J.F. Hair are frequently co-cited for their contributions to technology adoption models and research methodologies, demonstrating the interdisciplinary nature of open and distance learning research. Their work connects educational technology with broader fields like information systems.

Smaller clusters include key figures like M.G. Moore, known for his work on distance education theory, and A. Bandura, recognized for social cognitive theory, whose research is also frequently cited. These diverse clusters reflect the variety of theoretical frameworks and research traditions that underpin the field of open and distance learning.

3.5. Citation Analysis of Journals

Out of 1229 articles, these publications span across 465 different journals.

Table 4.

Distribution of articles by journal

Publication Titles	N	%
Turkish Online Journal of Distance Education	104	8.462%
Education and Information Technologies	82	6.672%
Open Praxis	29	2.360%
Interactive Learning Environments	25	2.034%
International Review of Research in Open And Distributed Learning	24	1.953%
Sustainability	20	1.627%
Journal of Qualitative Research in Education	19	1.546%
Yuksekogretim Dergisi	18	1.465%
Hacettepe University Faculty of Education Journal	17	1.383%
Cukurova University Faculty of Education Journal	16	1.302%
Sage Open	15	1.221%
Technology Knowledge and Learning	14	1.139%
International Journal of Assessment Tools in Education	11	0.895%
Computer Applications in Engineering Education	10	0.814%
Educational Technology Research and Development	10	0.814%
International Journal of Technology in Education	10	0.814%
Frontiers in Psychology	9	0.732%
Pamukkale University Faculty of Education Journal	9	0.732%
Education and Science	8	0.651%
Online Learning	8	0.651%
Plos One	8	0.651%
Bmc Medical Education	7	0.570%
E learning and Digital Media	7	0.570%
Education Sciences	7	0.570%
Journal of Computer Assisted Learning	7	0.570%

Out of 1,229 articles, these publications span across 465 different journals. As seen in Table 4, the Turkish Online Journal of Distance Education leads with 104 articles (8.46% of total publications), reflecting its central role in disseminating research in the field of distance education in Türkiye. Other key journals include Education and Information Technologies, which published 82 articles (6.67%), and Open Praxis with 29 articles (2.36%). Furthermore, several prominent Turkish journals, such as Yuksekogretim Dergisi and Hacettepe University Faculty of Education Journal, contribute significantly to the body of literature, indicating the strong domestic research output in education.

A citation analysis was conducted to examine the relationships between journals in the field of open and distance learning, with the goal of identifying which journals have the strongest citation links and the most influence within the academic community. For the analysis, a threshold was applied where only journals that had published at least 5 of the 1229 articles were included. Out of the 465 journals, 54 journals met this criterion. As some journals were not connected, the analysis focused on the largest connected group, consisting of 45 journals, ensuring that only journals with meaningful citation relationships were analyzed.

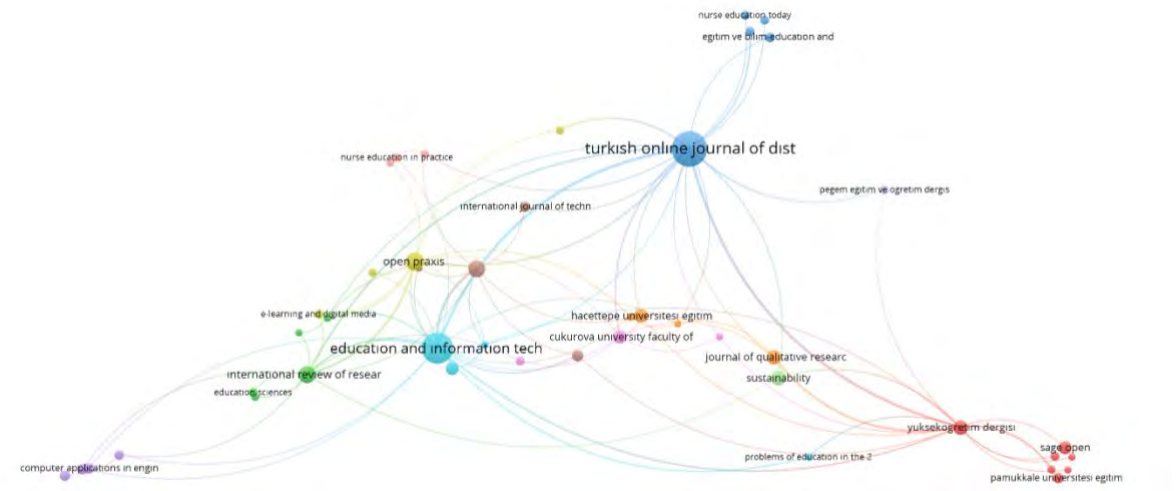

Fig. 6. Citation network of journals

The results, displayed in Fig. 6, identified 12 distinct clusters of journals that frequently cite each other. Turkish Online Journal of Distance Education emerged as one of the most influential journals, receiving numerous citations from other prominent sources, such as Education and Information Technologies and Open Praxis. This demonstrates the journal's central role in disseminating research, particularly in the Turkish context. Among the influential journals identified in the citation analysis, International Review of Research in Open and Distributed Learning (IRRODL) and Yuksekogretim Dergisi stand out for their respective contributions to global and local research in open and distance learning.

3.6. Co-authorship Network Analysis of Organizations

The analysis of the 1229 articles published in the field of open and distance learning reveals significant contributions from a wide range of author affiliations. Table 5 highlights the top 15 affiliations based on the number of contributing authors.

Table 5.

Distribution of affiliations

Affiliations	N	%
Anadolu University	109	8.86%
Türkiye Ministry of National Education	66	5.37%
Hacettepe University	60	4.88%
Ataturk University	57	4.63%
Ankara University	43	3.50%
Near East University	43	3.50%
Gazi University	40	3.25%
Akdeniz University	39	3.17%
Bartin University	33	2.68%
Dokuz Eylul University	30	2.44%
Yildiz Technical University	27	2.20%
Ege University	26	2.11%
Middle East Technical University	26	2.11%
Trabzon University	26	2.11%
Usak University	26	2.11%

As shown in Table 4, Anadolu University stands out with 109 authors affiliated with the institution, accounting for 8.86% of the total author contributions. Such a contribution underscores the pivotal role that Anadolu University plays in advancing research on open and distance learning, not only through its institutional focus on this area but also through the substantial number of researchers associated with it. The Ministry of National Education also has a prominent presence, with 66 authors (5.37%) affiliated with the institution. Other notable institutions include Hacettepe University and Ataturk University, with 60 authors (4.88%) and 57 authors (4.63%), respectively. Among the institutions contributing to the field,

universities such as Bartin University and Usak University stand out with 33 (2.68%) and 26 (2.11%) authors, respectively, despite being less prominent in size or scale compared to leading institutions.

The co-authorship analysis reveals the structure of collaboration between organizations involved in open and distance learning research, with seven distinct clusters emerging from the network visualization (Fig. 7).

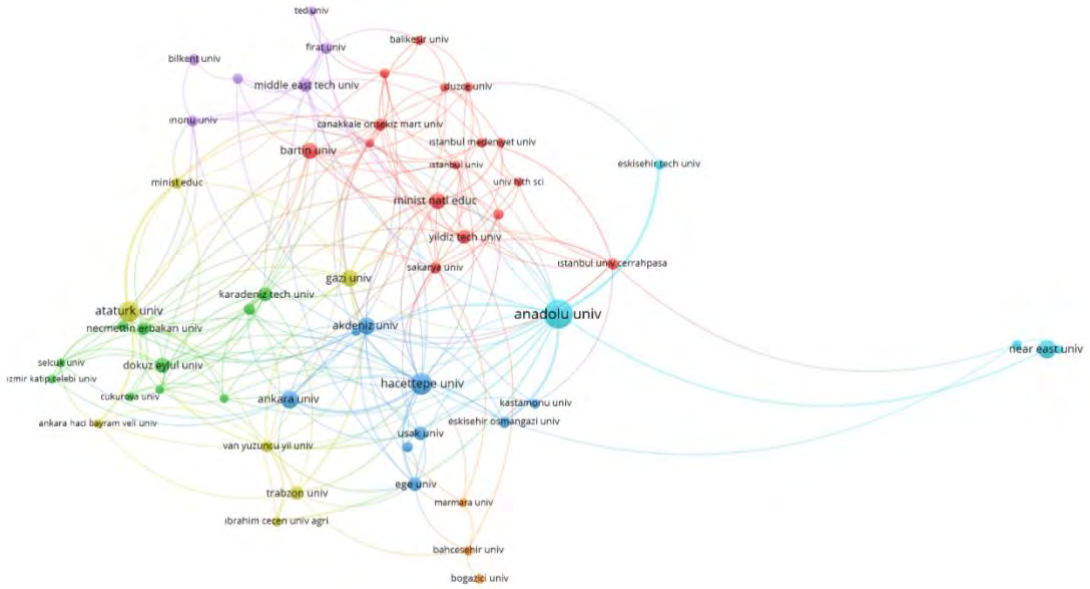

Fig. 7. Co-authorship network of organizations

Anadolu University is the most prominent node in the network. This prominent position demonstrates Anadolu University's significant influence on research and co-authorship within open and distance learning. The strength and breadth of its connections suggest that the university plays a central role in facilitating large-scale collaborative efforts, helping to shape the research landscape in this domain.

4. Discussion and Conclusion

In this study, a bibliometric analysis was conducted on articles (both research and review) affiliated with institutions or authors in Türkiye, indexed in the WoS database (SSCI, SCIE, and ESCI), and published between 2020 and 2024 on topics related to open and distance learning (including online learning, distance education, e-learning, blended learning, digital education, and virtual learning environments). The analysis examined the distribution of articles by year, keyword co-occurrence, co-authorship networks, co-citation, and citation patterns of journals. Additionally, institutional contributions to open and distance learning research were addressed, showcasing academic productivity and research trends in the field. This study can be considered the first bibliometric analysis of open and distance learning research in Türkiye using the WoS database.

According to the research findings, "distance education" emerged as the most frequently used keyword, followed by terms such as "online learning," "COVID-19," and "e-learning." These keywords highlight the significance of the transition to digital education, particularly during the pandemic, and the focus of research in these areas. The frequent appearance of pandemic-related terms underscores the substantial impact of the global health crisis on educational research. Similarly, Bakac (2021) conducted a bibliometric analysis of 107 articles from the Scopus database, identifying key terms such as "pandemic," "online learning," "distance education," "satisfaction," and "e-learning" as closely linked with "COVID-19." Also Ergün and Ergün (2024) analyzed 568 open-access articles indexed in Scopus, noting frequent use of terms like "distance education," "COVID-19," "distance learning," "online learning," "machine learning," "deep learning," "higher education," and "e-learning." Additionally, Hebebci et al. (2021) examined 767 scientific articles indexed in the Web of Science database using bibliometric and content analysis methods. Their findings revealed that "COVID-19" and "distance learning" were the most frequently occurring terms, with

most publications concentrated between 2020 and 2021. In the same context, Karagözoğlu et al. (2024) conducted a bibliometric analysis of 3148 studies from the Web of Science database, revealing a significant increase in distance education research since 2019.

Among the authors, A. Bozkurt stands out as the most productive, contributing significantly to the total number of publications. The analysis indicates that Bozkurt has collaborated extensively with both regional and international researchers, including prominent figures such as O. Zawacki-Richter and C.M. Stracke. This demonstrates that Bozkurt's work spans multiple institutions and has had a global impact, making a substantial contribution to the field of open and distance learning. Similarly, both Ergün and Ergün (2024) and Karagözoğlu et al. (2024) highlight A. Bozkurt as a leading and highly productive researcher in the field of distance education, with Ergün identifying Bozkurt as a prominent figure in co-authorship networks and Karagözoğlu noting his extensive contributions to meta-analyses on distance education, further supporting his significant global impact and collaborative influence in the field. Bozkurt is followed by other notable authors such as F. Altinay and Z. Altinay. Additionally, H.Y. Durak, R. Yılmaz, G. Dagli, and S.S. Kozat have also made significant contributions to the field.

The articles examined in this study have been published in various journals, with the Turkish Online Journal of Distance Education playing a central role in the dissemination of research in the field of distance education. The establishment of Anadolu University's Open Education Faculty in the 1980s marked a significant turning point in the integration of distance education into higher education in Türkiye. This faculty quickly reached a large number of students, creating valuable opportunities, particularly for individuals living in rural areas or those unable to participate in formal education (Bozkurt, 2017). Anadolu University's success accelerated the adoption of distance education in Türkiye, contributing to its widespread use (Ozkul, 2001). As a reflection of this success, Anadolu University, which oversees the publication of the Turkish Online Journal of Distance Education (indexed in ESCI), has become a key academic center for distance education. Notably, the university's master's (thesis/non-thesis) and doctoral programs in the Department of Distance Education have become important destinations for researchers in Türkiye, fostering increased scientific production in this field. As demonstrated by this analysis, Anadolu University has made the most significant institutional contribution to open and distance learning in Türkiye. The university's historical role and academic publishing activities have reinforced its leadership position in the field. Internationally prominent journals such as Education and Information Technologies and Open Praxis also stand out for their significant contributions to the field. Additionally, Turkish journals such as the Higher Education Journal and the Hacettepe University Faculty of Education Journal have made important contributions to the distance education literature. Besides Anadolu University, institutions such as the Türkiye Ministry of National Education, Hacettepe University, Atatürk University, and Ankara University have also significantly contributed to distance education research, fostering academic productivity in this field in Türkiye. Similarly, Ergün and Ergün (2024)'s findings highlight that the Turkish Online Journal of Distance Education is the primary publication platform for Türkiye-based studies, followed by journals such as the International Review of Research in Open and Distance Learning, Ministry of National Education, Participatory Educational Research, and Education and Information Technologies.

There has been a significant increase in the number of academic studies in the field of open and distance education both globally and in Türkiye. In particular, the rapid development of digital learning technologies and global factors such as the COVID-19 pandemic have further amplified the importance of research in this field. According to the search criteria of this study, while there were 30547 articles in the WoS database globally prior to the last five years (1980–2019), this number increased to 33217 in the period from 2020 to 2024. This growth reflects the rapid expansion of research in open and distance education and the rising interest in studies within this field. The widespread adoption of digitalization and online education technologies has likely fueled this growing demand for research.

A similar trend has been observed in Türkiye. According to the search criteria of this study, while 856 studies were conducted in Türkiye between 1989 and 2019 in the WoS database in the field of open and distance learning, this number increased to 1229 in the last five years (2020–2024). This sharp rise indicates

that academic productivity in Türkiye has increased in parallel with global trends, with distance education attracting greater attention in academic circles.

This study underscores the need to understand the dynamics behind the surge in research on open and distance learning and how future studies in this field can be directed.

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