Education and Science

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Eighteen years of the Journal of Education and Science (2007-2024): Publication trends, research gaps, and global representation

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Abstract

Education and Science (Eğitim ve Bilim) is a leading peer-reviewed educational research journal published by the Turkish Education Association. To examine research trends, we conducted a bibliometric analysis and topic modeling on a dataset of n=1,372 articles published in the journal from 2007 to 2024 using the PRISMA approach. Our analysis identified n=2,077 unique authors, with n=421 (20%) publishing either as sole authors or having contributed only once. The co-authorship rate is 2.06%, and the international collaboration rate is 3.72%. The journal's annual growth rate of publications has declined by 2.73%, with the mean article age of 8.77 years and 5.39 citations per article. The analysis further identified n=4,088 unique keywords and n=61349 cited sources, which were thematically organized into eight research areas as follows: [1] Education and Management in Higher Education (3.92%), [2] Innovative Approaches in Teacher Education and Teaching Skills (6.24%), [3] Language Teaching and Learning Approaches (6.40%), [4] Psychosocial Dynamics and Organizational Structures in Educational Environments (7.49%), [5] Inclusion in Education and Education Policies (13.53%), [6] Enhancing Early Childhood Education and Skills (18.39%), [7] Interdisciplinary Pedagogical Approaches (20.72%), and [8] The Effects of Psychological Factors on Student Success in Education (23.31%). Moreover, we examined the institutional and national affiliations of researchers whose studies were published in the journal. The findings highlight that Hacettepe University in Turkey had the highest number of contributing authors. As well, an analysis of the keywords used in these articles, revealed that most studies centered on teaching and learning. We discuss the trends observed in the number of citations over the 18-year period and conclude with recommendations for fostering the journal's growth.

Keywords

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Introduction

Educational research is a continuously evolving field that strives to meet the changing needs of learners, instructors, and society. Ferguson et al. (2017) have argued that the role of education is threefold, encompassing personal growth, civic responsibility, and economic progress. These aspects are reflected in education's aims of enhancing employment and labor efficiency, developing active citizens capable of addressing global challenges, and fostering personal growth. To achieve these goals, it is important to recognize that the education system is a complex mechanism that requires a thorough understanding and sound data for evaluation. This is why educational research plays a pivotal role in educational practices. The review and systematization of findings are timely and important due to the continuous nature of research.

In their seminal work titled Educational Research: A Guide to the Process, Wallen and Fraenkel (2013) highlight two core goals that educational research serves. They stress that "a major purpose of educational research is to provide evidence to help people decide which opinions are correct—or at least more correct…A second purpose of educational research is to help us develop better ways to think about the field of education" (p.3). They further noted that" [d]ecisions affecting the greatest resource that human beings have, their children, should be informed by knowledge, not by the loudest voices that can be heard" (p.3).

This warrants an examination of educational research to assess the state of the art, identify key topics and thought leaders, and highlight emerging trends. Conducting a search in the "Education & Educational Research" category on Web of Science will yield thousands of results (Huang et al., 2020). Systematic reviews of academic journals are indispensable for examining the state of the art in educational research and advancing the field by identifying gaps in knowledge and charting a path forward for future inquiries. The insights gained from systematic reviews are valuable not only to practitioners but also to editorial boards and publishers.

Education and Science Journal (Eğitim ve Bilim), published by the Turkish Education Association (TED) and indexed in the Web of Science (WoS) Q4, is a leading peer-reviewed educational research journal that has been published quarterly since 1976 in both English and Turkish.

Its editorial board is composed of academics from international and national universities. It is Turkey's only journal in the field of educational sciences indexed in the SSCI of WoS. Its 2023 Journal Citation Indicator is 0.26 (Szomszor, 2024), and its H5 index is 24 (Google Scholar, 2024). The journal brings together researchers who strive to solve educational problems at both local and international levels. Considering its scope, multidisciplinary focus, and notable influence on educational research, both within Türkiye and internationally, Education and Science (Eğitim ve Bilim) is an important voice in the educational research community, and therefore, was chosen for analysis. While it is important to identify the trends of this journal, which aims to contribute to high-quality scientific studies addressing issues in learning and teaching and aspires to become a "focus journal" as stated in its mission statement, these objectives provide the impetus for this study.

This study aims to reveal current trends, citation patterns, and research collaborations by analyzing publications in the field of educational sciences. Understanding these trends is imperative for promoting scientific productivity and guiding future research. Furthermore, this analysis will help assess the impact of academic journals and provide strategic recommendations for the development of educational research.

This research is important and timely because through the lens of the journal, we can gain valuable insights into the state of the art that can enhance our understanding, better inform educational practices and student experiences, and guide future directions in educational research.

Study aims and research questions

The study aims to answer the following four questions:

1. Who are the researchers that publish in the journal?
2. What topics and keywords emerge most frequently in the studies?
3. Which institutions and countries are represented by researchers in studies published in the Education and Science Journal?
4. What trends are observed in the number of citations over the 18-year period (2007-2024)?

Background

Much of the literature on educational research employs bibliometric analysis methods to examine large corpora of academic texts spanning several decades. As will be evidenced in the following paragraphs, the results underscore the breadth and depth of research interests and illustrate how educational research has transformed over time. The term bibliometrics is a portmanteau term combining two words— "bibliography" and "metrics," coined by Alan Pritchard in his paper titled Statistical Bibliography or Bibliometrics?, published in the Journal of Documentation (Agada, 1987). Pritchard defined the term as "the application of mathematics and statistical methods to books and other media of communication" (Pritchard, 1969 as cited in Roemer & Borchardt, 2015). More broadly, bibliometrics serves to quantify and analyze textual content.

A recent example of bibliometric analysis is the study published in Educational Review by Huang et al. (2020), which examined a sample of n=19,084 papers published between 2000 and 2017. The results highlighted a sixfold increase in publication volume over this period. The most frequently researched topics were higher education, interactive learning environments, and teaching and learning strategies. The USA, UK, and Australia produced the highest number of publications annually.

Another study by Hallinger and Kovačević (2019), examined n=22,361 peer-reviewed articles on educational administration published in Scopus-indexed journals between 1960 and 2018. The study employed a science mapping technique to analyze research trends in the field, identifying influential papers and the institutions actively engaged in this area of research. The study denotes a shift in focus of research over time from "school administration" to "school leadership".

An example of a study specific to the Education and Science journal is that by Selçuk et al. (2014) which analyzed the content of n=492 articles published between 2007 and 2013. The study examined variables such as sample size, method, discipline, subject, data collection tools, and summarized core findings and recommendations. The results suggest that much of the discourse revolved around curriculum and instruction. The studies often relied on quantitative methods, had small to medium sample sizes, collected data through scales, compared means of variables, and were primarily authored by scientists from Hacettepe University.

A more recent bibliometric analysis by Altunışık (2023) examined a sample of n=1,270 articles published in the Education and Science Journal covering the period from 2007 to 2021 analyzing the total number of publications and citations, h-index, citations per publication, annual citation rate, citation threshold, and total link strength. The results confirm those of Selçuk et al. (2014), highlighting that much of the research is published by scholars from Hacettepe University, which was cited n=5,361 times. The most cited publication was in the field of science education by Murat Özdemir. Moreover, the study identified the most frequent keywords; these include: Academic achievement, reliability, validity, teacher, gender, pre-service teachers, self-efficacy, higher education, and structural equation modeling.

Hacettepe University was again mentioned in the study by Gülmez et al. (2021), who conducted a bibliometric analysis of educational research in Turkey published in international journals, using a sample of n=613 articles. The results highlight that much of the research was authored by researchers from Hacettepe University, particularly in the fields of educational technologies and science education. Moreover, articles published by Middle East Technical University received the most citations.

While the scope of these studies was quite broad, some scholars take a more specific focus, such as the study by Dao et al. (2023), which examined a sample of 309 papers published during the 2017-2021 period on Education 4.0 an emerging field related to educational transformation in the context of the Fourth Industrial Revolution. In line with the bibliometric genre, the authors identified countries with the highest number of publications, where Malaysia, Indonesia, Mexico, Brazil, and the Philippines are among the top contributors, while international collaborations are scarce.

While the studies mentioned above are methodologically similar to this one, the following studies are comparable in terms of content.

A study with a more specific focus on educational research from Turkey was conducted by Özcan and Akar (2024) who analyzed a modest sample of n=176 articles published in the National Journal of Education between June 2021 and January 2024 using bibliometric analysis. These results suggest that much of the research was conducted using qualitative methods, revolved around the topics of educational sciences and management, and that most articles were authored by teachers from the Ministry of National Education (MoNE).

A more recent study by Rojas- Rojas-Sánchez et al. (2023) examined the application of virtual reality technologies in education, using bibliometric analysis to identify key research topics, influential authors, sources, and citation trends across a sample of n=273 articles published between 2010 and 2021. The findings suggest that the highest average citation rates were in 2010 and 2014, with 6.9 and 7.3 citations per year, respectively. From 2010 to 2017, research focused primarily on using computer simulations to enhance student engagement. In 2018, the focus shifted toward social learning, with virtual communities like “Second Life,” where users interact through avatars and communicate via text and voice messaging. In 2019, the theme of designing technology-enhanced learning environments emerged, and by 2020, e-learning became central to the discourse, with increased attention to virtual and augmented reality tools supporting remote learning.

These results tally with those of Johri et al. (2024) who examined a sample of 66 studies published between 2012 and 2023 on the role of the Metaverse in sustainable development to identify emerging themes, co-authorship patterns by country, and influential theories. The results highlight an annual increase in publication volume of 37% and a notable spike in interest in the topic during the COVID-19 pandemic due to the transition to digital communication.

Bibliometric analysis using topic modeling-based methods is scarce in literature. A search of the literature revealed that only one study by Özyurt and Ayaz (2022) was found, in which a complete journal review was conducted using the aforementioned method. Their study was conducted to mark the 25th anniversary of the Education and Information Technologies (EAIT) journal. Topic modeling-based bibliometric analysis was employed, and the results were organized into 21 topics. The top five most frequently discussed topics include “Technology acceptance”, “Social network-based learning”, “Teacher education”, “E-learning satisfaction” and “E-learning”. The study further identified two topics that are growing in interest; these include: gamification and technology acceptance.

To mark the 50-year anniversary of The British Journal of Educational Technology (BJET), Chen et al. (2020) conducted a bibliometric analysis and topic modeling of n=3,710 articles published between 1971 and 2018 in the WoS database. The authors identified publication and citation trends, examined the distribution of article types, discovered the most relevant countries, affiliations, and authors, and uncovered key thematic features by analyzing publication abstracts and titles using word cloud and topic modeling analysis. Technology-supported classroom pedagogy, blended learning, online social communities, mobile-supported language learning, game-based learning, and socialized e-learning were identified as topics of increasing relevance to educational needs.

In another study, Yun (2020) used topic modeling to determine research trends in physics education by analyzing 2,959 articles from the American Journal of Physics (AJP) and n=745 articles from Physics Review Physics Education Research (PRPER). A total of 13 topics were extracted from the two journals, where "pedagogical knowledge content", "assessment of achievement" and student's "gender" were identified as topics of growing interest. And while "teacher education" and "students' reasoning process" were identified as topics of high interest, the results suggest that attention to "introduction to physics" and "problem solving" is declining.

Given the scope of prior research, literature reviews in the field of education are generally limited to bibliometric analyses, and subject modeling was found to have been conducted in education-related journals in only three studies. While bibliometric studies provide an overview of topics or literature within a specific time period, topic modeling allows for a more in-depth examination. In this study, the Journal of Education and Science was examined not only through a bibliometric lens but also through topic modeling, to provide a holistic view of the potential research gaps and future publication trends.

Method

To examine research trends in the field of educational research, this study employs bibliometric analysis (Donthu et al., 2021) and topic modeling techniques (Vayansky & Kumar, 2020). These approaches are increasingly used for the systematic evaluation of academic literature, as advances in information and communication technologies make it feasible to analyze large, thematically organized academic corpora that are accessible and affordable through databases. Donthu et al. (2021) maintain that "bibliometric analysis is useful for deciphering and mapping the cumulative scientific knowledge and evolutionary nuances of well-established fields by making sense of large volumes of unstructured data in rigorous ways" (p. 285).

Systematic Review

The bibliometric profiles of the studies in the Education and Science Journal were examined and the topics under which the studies were grouped were determined. This type of research is classified as descriptive research. Descriptive research is research that tries to describe the existing situation in order to provide insights to generate hypotheses and theoretical foundations (Aggarwal & Ranganathan, 2019; Erkuş, 2021). By observing and collecting data on a particular topic, descriptive research helps researchers gain a deeper understanding of a particular topic and provides valuable insights that can inform future studies. This method is applied to large samples, especially in quantitative research. The researcher collects data from such surveys and analyzes it to better understand the current situation. Descriptive models often help researchers comprehend the existing body of knowledge, identify research questions and guide the hypothesis development process before embarking on a research project (Köroğlu, 2015).

Data Collection

The data of the study was obtained by searching the Education and Science Journal from the Web of Science (WoS) database. The Web of Science database is a database developed by Clarivate Analytics and contains more than a thousand journals, books, conferences and reports. This database includes the Science Citation Index-Expanded (SCI-Expanded), Social Sciences Citation Index (SSCI), Arts & Humanities Citation Index (A&HCI), Emerging Sources Citation Index (ESCI), Book Citation Index (BCI) and Conference Proceedings Citation Index (CPCI) indexes (Li et al., 2018). Education and Science Journal is included in the Q4 quarterly journal list in the SSCI index. While collecting the data, the following key index was used:

"SO= (EGITIM VE BILIM EDUCATION "AND" SCIENCE)"

Inclusion and exclusion criteria were applied to the data obtained as a result of the screening according to the PRISMA flowchart created by Moher et al. (2009) The PRISMA flow used in the process of organizing the data of the study is given in Figure 1.

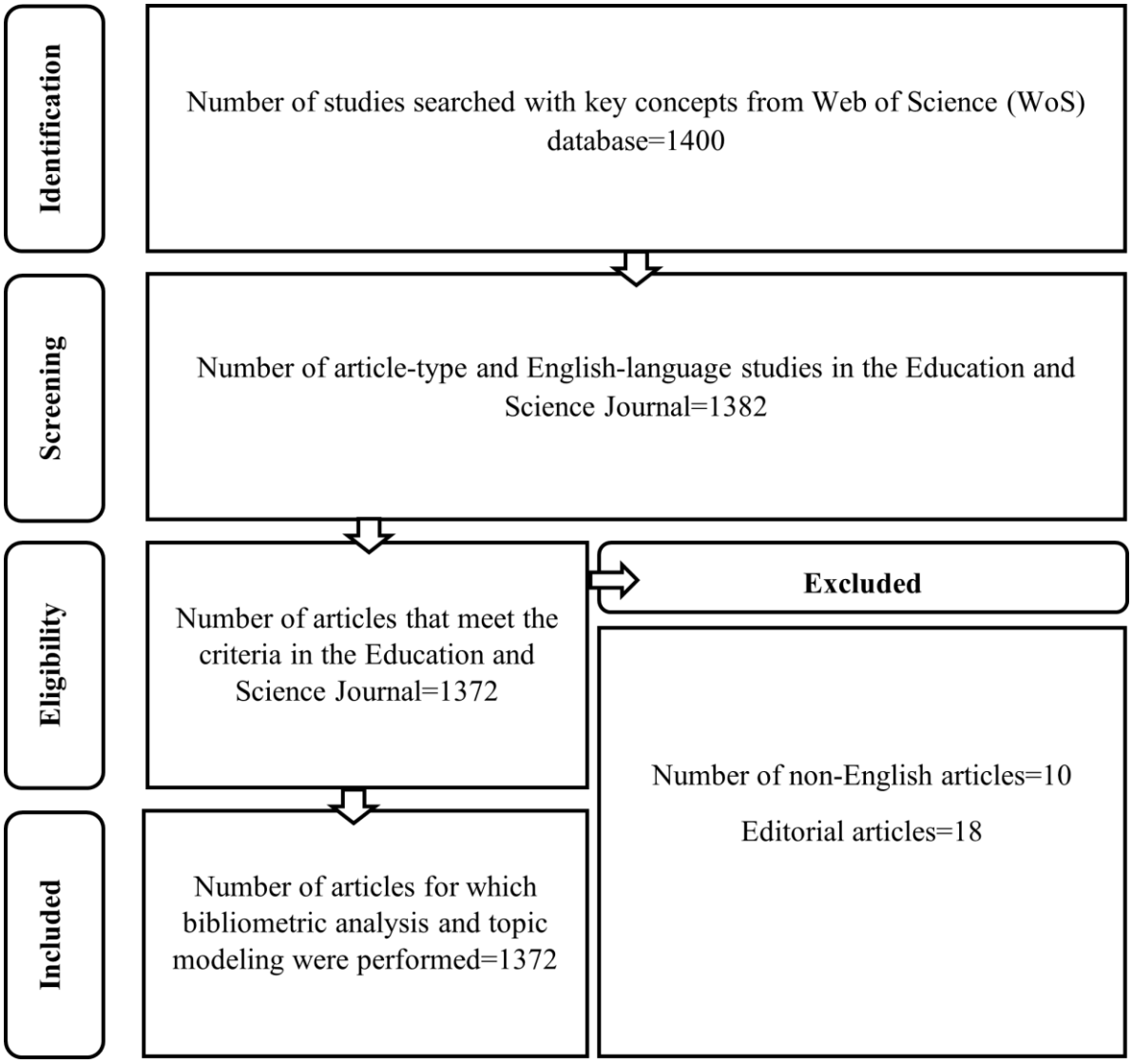


Figure 1. The process of collecting the data according to the PRISMA flow diagram

When Figure 1 is examined, n=1,372 publications published in the WoS database between 01/01/2007 and 31/07/2024 in the Education and Science Journal in the article type and in English constitute the data of the study.

Data Analysis

Bibliometric analysis is a tool for understanding the structure, transformation, and impact of scientific literature. It helps to understand relationships within and assess the impact of scientific research (Zupic & Cater, 2015). Bibliometric analysis was performed with the Bibliometrix package written by Aria and Cuccurullo (2017) in the R programming language. The analysis was visualized with the Biblioshiny application, which is a user-friendly interface within this package. As a result of the analysis, the distribution of articles by year, the author who produced the most articles in the journal, the most cited author, the most cited article, the most frequently used keywords in the articles and trending topics were reported.

In the second step of the data analysis, topic modeling analysis was performed. Topic modeling is a text mining method. Text mining is one of the challenging research topics due to the need to organize and categorize an increasing number of electronic documents worldwide (Uysal & Gunal, 2014). The goal of text mining is to classify, group, and tag texts; summarize data sets, create taxonomies, and gain knowledge by analyzing word frequencies and relationships between data items (Rouse, 2018). Text mining is an increasingly popular method for extracting important knowledge and insights from large volumes of unstructured textual data. As the number of research articles, reports, and other text-based resources in higher education continues to grow, text mining provides a powerful method to analyze and understand research trends in this field (Tyagi, 2021). Topic modeling is a text mining technique that aims to find hidden themes and patterns in a text collection. By eliminating the need for manual categorization or tagging, this unsupervised machine learning approach gives researchers the power to grasp the organization and content of extensive document collections. It independently distinguishes hidden motifs and groups of related terms or concepts embedded in textual data, thus facilitating a comprehensive understanding of the content (Shadrova, 2021). Topic modeling is the process of identifying important topics in a text using probabilistic models. These probabilistic models help to analyze and classify a corpus of texts so that a person can easily recognize important topics in them without having to read the entire document. It is important to note that these models are informed by knowledge about the texts being analyzed, the topics of interest can range from science to art. Models that fall into this category include latent semantic analysis, probabilistic latent semantic analysis and Latent Dirichlet Allocation (LDA) (Özkan, 2015).

In this study, the LDA method was used in the topic modeling analysis. LDA is a generative probabilistic model. It improves Probabilistic Latent Semantic Discrimination by adding priorson topic distributions for documents and word distributions for topics. LDA assumes that the creation of each document requires an initial sampling of a topic distribution followed by a sampling of words from the identified topics. To estimate model parameters, techniques such as Gibbs sampling or Variational Inference are commonly used and allow for an accurate representation and analysis of the document corpus (Blei et al., 2003).

Text Preprocessing Phase

Before proceeding with topic modeling analysis, the data must undergo a preprocessing process and text-to-vector transformation. Text preprocessing is one of the necessary processes for organizing and structuring unstructured texts prior to analysis (Aggarwal & Zhai, 2013). For this, texts are first broken down into the smallest meaningful units, i.e. words. Then, meaningless and missing words, web links, numerical expressions and punctuation are removed from the texts. After this process, frequently used stopwords in English are deleted from the texts. In this way, the texts are transformed into word vectors. These processes, depicted in Table 1, are as follows (AlSumait et al., 2008; Barde & Bainwad, 2017).

Table 1. Text Preprocessing Steps

#	Process Step	Description
1	Transformation	All words in the corpus are converted to lower case. In addition, removal of diacritics and URL extensions, and html parsing are also performed in this process.
2	Tokenization	All sentences in the corpus are broken down to individual words.
3	Normalization	The original forms of words are extracted. That is, valid root forms are provided, considering the lexicon of a given language.
4	Lemmatization	During lemmatization, the focus is on nouns, adjectives and verbs, ensuring the singularity of words.
5	Filtering	The extraction of stopwords and digits in the corpus that do not make sense on their own is performed

After these steps, word vectors are created, the document term matrix is created, and the topic modeling analysis is started.

Topic Modeling Analysis

The collected texts, initially qualitative data, were transformed through a word-vector transformation, to become suitable for quantitative analysis. At this stage of the analysis, the Orange Data Mining program was used. This program uses the Python language (Demšar et al., 2013). The steps of this process are given in Figure 2.

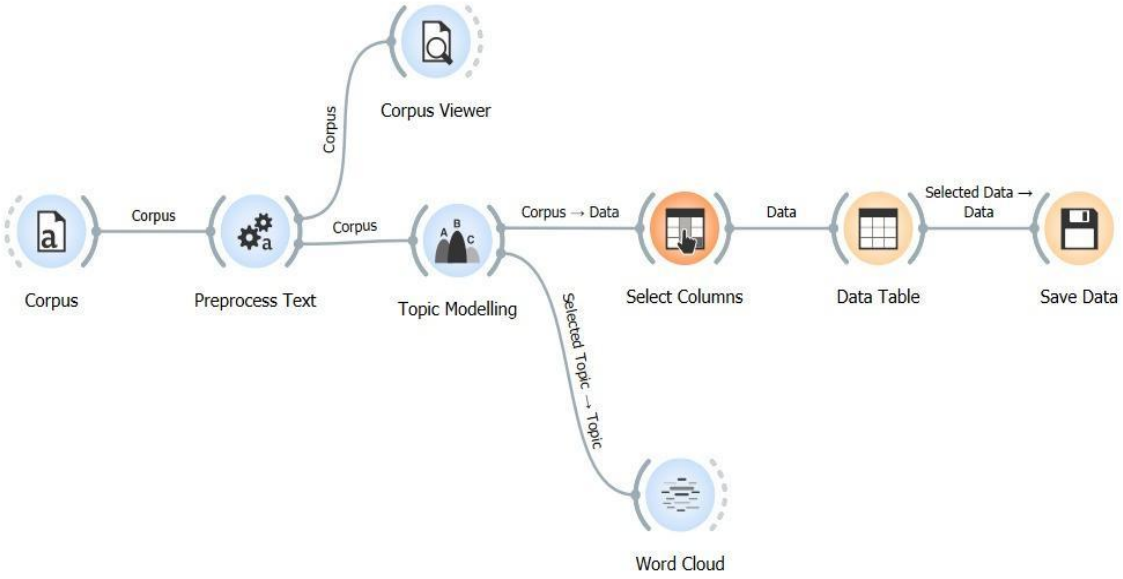


Figure 2. Steps of topic modeling analysis in the Orange Data Mining program

Topic modeling analysis is built on two basic assumptions. The first assumption is that each document in the corpus is a mixture of all topics. The second assumption is that each topic is a mixture of lexical terms. The interpretation that emerges from these two assumptions is that the topic variable in the model is selected repeatedly within each document, allowing the documents to consist of more than one topic. The researcher is at the forefront in determining the number of topics. That is, the decision is subjective and based on expert judgment (Bystrov et al., 2023). In order to account for possible subjectivity and to allow for a more standardized estimation procedure, several evaluation criteria have been developed to determine the optimal number of topics in LDA models. Some of them aim to minimize the similarity of different topics (Cao et al., 2009), maximize topic coherence (Mimno et al., 2011), or maximize the agreement between predicted and actual document term frequencies (Lewis & Grossetti, 2022). Accordingly, one of the methods for calculating the appropriate number of

topics is topic fit analysis. Topic Fit Analysis serves as an evaluation method for topic models designed to determine the ideal number of topics for LDA based content analysis (Alrayashi, 2023). Another method is the calculation of the perplexity value. The perplexity refers to a metric that gives the average uncertainty provided by the model to each word in the dataset (Tang et al., 2018). In general, the lower the model's perplexity score, the better the generalization performance. Before performing the topic modeling analysis, coherence and log perplexity values were calculated to determine the appropriate number of topics. The number of topics increased to 30 starting from 1. The obtained coherence and perplexity values are given in Table 2.

Table 2. Coherence and Log perplexity values of topic modeling analysis

Topic coherence	Log perplexity	Topic count
0.261	130.753	1
0.271	129.483	2
0.300	126.739	3
0.306	125.891	4
0.316	125.944	5
0.314	126.210	6
0.309	125.865	7
0.319	***125.927***	***8****
0.308	126.135	9
0.303	126.424	10
0.314	126.852	11
0.309	126.494	12
0.310	126.297	13
0.302	126.430	14
0.311	126.635	15
0.310	127.440	16
0.306	127.318	17
0.310	127.774	18
0.306	128.332	19
0.307	129.186	20
0.298	129.377	21
0.304	129.678	22
0.298	129.377	23
0.306	130.077	24
0.300	130.895	25
0.310	130.503	26
0.305	131.526	27
0.301	132.119	28
0.310	132.258	29
0.306	132.145	30

* Determined topic count

The highest coherence value (see Table 2) and one of the lowest log perplexity values are obtained when the number of topics is eight. By analyzing both these values and the resulting word clouds, the researchers reached a consensus that the number of topics should be eight.

Trend Analysis

The trends of topics may change over time. This allows researchers to focus on different topics in their field of study. The annual percentage of the number of articles on each topic reflects the degree of interest in that topic. The percentage data changes every year, and some changes fluctuate rapidly in the short term. A scatter plot of the topic's annual share data can reflect this change. We refer to the literature to obtain a relatively stable change trend of the topic based on the annual percentage data (Cho et al., 2017; Yin & Yuan, 2022). Accordingly, in the last part of the analysis, the distribution over time according to the topic weights obtained from the LDA model, the volumes of the topics over time (by years), the change trends of the topics, and the acceleration values of the topics relative to each other were calculated.

Results

In this section, following the order of research questions, we present the results of bibliometric analysis and topic modeling. We commenced the analysis by providing a general overview of the journal, including the number of keywords and references, and information about the authors of n=1,372 articles. Table 3 depicts that the annual growth rate of the Education and Science Journal is -2.73%. annual growth rate is negative. The average age of the articles published in the journal is 8.77 years. This shows that the journal is a young journal depending on the time it has been in the WoS database.

The average number of citations per article is 5.386 where n=4088 keywords and n=61,349 sources were used in the articles. Of these articles, n=421 were written by a single author and the total number of authors was n=2,077.

Table 2. Overview of articles published in the Education and Science Journal

General information		**Results**
Main information about data	Time interval	01/01/2007:31/07/2024
	Number of journals	1
	Number of articles	1,372
	Annual growth rate	%-2.73
	Average age of articles	8.77
	Average number of citations per article	5.386
Articles	Number of keywords	4,088
	Number of references	61349
Authors	Number of authors	2,077
	Number of single authors	421
	Co-authorship rate per article	2.06
	International authorship rate	%3.72

The rate of co-authorship per article is 2.06. Most of the articles have two authors. The international co-authorship rate is 3.72%. Accordingly, it is seen that the rate of foreign authors in the journal is low. The distribution of 1,372 articles in the journal between 2007 and 2024 is presented in Figure 3.

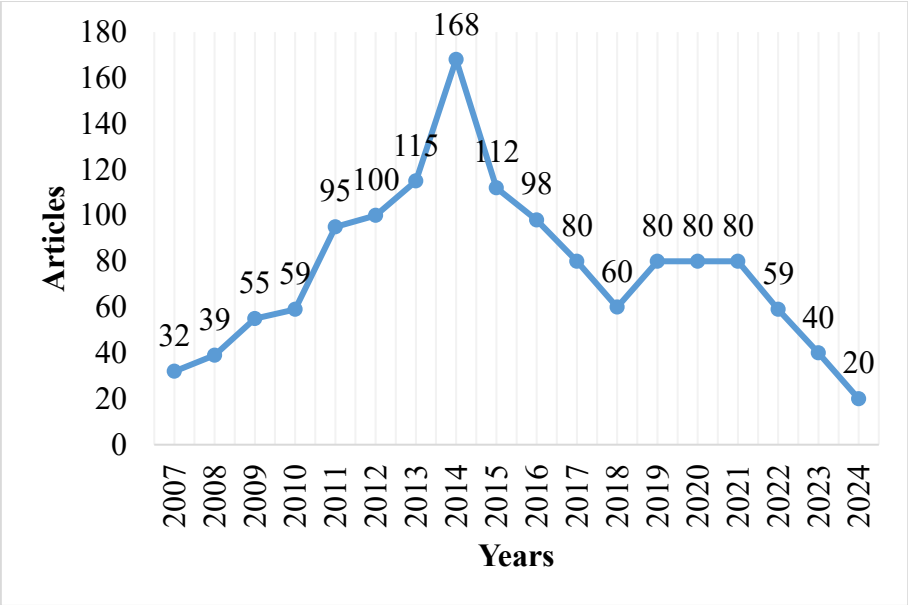


Figure 3. Distribution of articles according to years of publication

The highest number of articles was published in 2014 (n=168), while the lowest number of articles was published in 2024 (n=20). Since 2024 has not been completed yet, it is seen that the least number of articles was published in 2007 (n=32). The yearly average citation rates of articles are depicted in Figure 4.

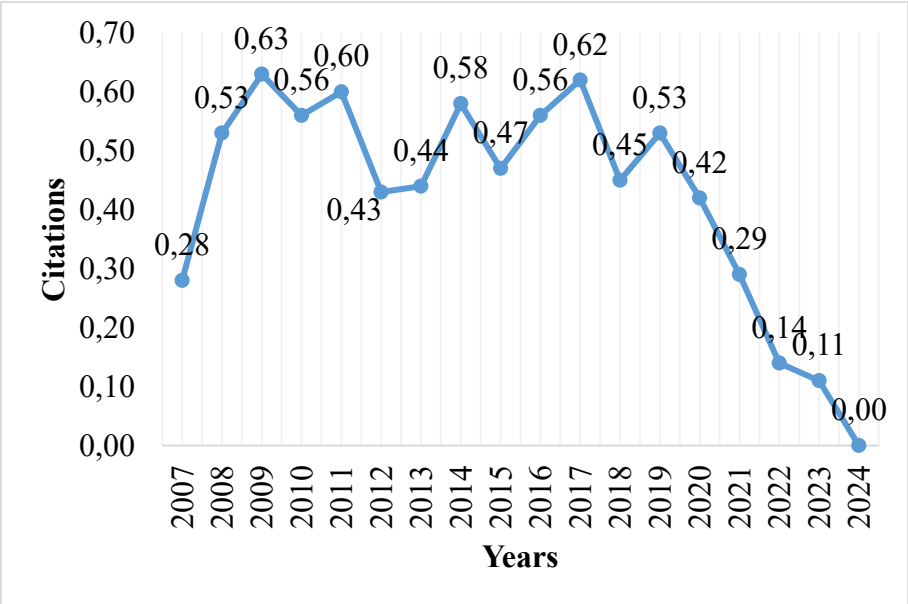


Figure 4. Citation averages of articles by year

The years with the highest average citation rates are 2009 and 2017 (c=0.63). A breakdown of the annual citation rates is presented in Table 4.

Table 3. Annual citation rate

Year	Mean Total Citations per Article	N	Mean Total Citations per Year	Citable years
2007	5.38	32	0.30	18
2008	9.54	39	0.56	17
2009	10.64	55	0.66	16
2010	8.97	59	0.60	15
2011	8.99	95	0.64	14
2012	6.03	100	0.46	13
2013	5.68	115	0.47	12
2014	6.96	168	0.63	11
2015	5.17	112	0.52	10
2016	5.64	98	0.63	9
2017	5.54	80	0.69	8
2018	3.60	60	0.51	7
2019	3.70	80	0.62	6
2020	2.55	80	0.51	5
2021	1.44	80	0.36	4
2022	0.58	59	0.19	3
2023	0.32	40	0.16	2
2024	0.00	20	0.00	1

Although most articles were published in 2014, the highest number of citations did not occur this year. Although 20 articles were published until the first half of 2024, there is no cited publication yet. When the average number of citations per year of the articles was analyzed, it was determined that the ratio was highest in 2017 and lowest in 2024. However, a gradual decrease was observed in the number of articles cited in the journal over the years. While older publications of the journal receive more citations, this number decreases for newer articles. The average number of citations per year between 2008 and 2020 has reached the highest values.

Who are the researchers that publish in the journal?

The number of articles and proportionally decimalized articles of the ten researchers who produced the most articles in the Education and Science Journal are given in Table 5.

Table 4. Ten researchers who produced the most articles in the Education and Science Journal

Authors	Articles	Articles Fractionalized
Nuri Doğan	10	5.00
Murat Özdemir	9	5.39
Ömer Geban	7	3.00
Hayati Akyol	6	2.70
Adnan Baki	6	2.75
Yüksel Göktaş	6	2.08
Ömer Kutlu	6	2.83
Semra Sungur	6	2.67
Ahmet Akın	5	3.50
Uğur Akın	5	2.83

The highest number of articles in the Education and Science Journal was written by researcher Nuri Doğan (n=10). Murat Özdemir (n=9) and Ömer Geban (n=7) are in second and third place respectively (see Table 5). The proportionally decimalized number of articles measures an author's contribution to a set of published articles. Accordingly, the researcher with the highest number of decimalized articles is Murat Özdemir (n%=5.39). Nuri Doğan (n%=5.00) ranked second and Ahmet

Akın (n%=3.50) ranked third. The ten researchers with the highest number of citations among the researchers who published articles in the Education and Science Journal are presented in Table 6.

Table 5. The ten most local cited researchers in the Education and Science Journal

Authors	Total citations
Selahattin Gelbal	15
Duygu Anıl	13
Mehmet Palancı	12
Veli Duyan	11
Cemal Ergin Ekinci	11
Deniz Melanlıoğlu	11
Hakan Dündar	10
Mehmet Kandemir	10
Ziya Selçuk	10
Eren Ceylan	9

The list of ten most cited researchers in the Education and Science Journal is presented Table 6. The three researchers who received the most local citations from the articles published in the Education and Science Journal are Selahattin Gelbal (n=15), Duygu Anıl (n=13) and Mehmet Palancı (n=12). Selahattin Gelbal has 5 articles published in the Education and Science Journal. Four of these articles are ranked first due to their high annual citation rates.

The distribution of the publications of the researchers who published articles in the Education and Science Journal according to the years is given in Figure 5. The points in the figure show the article production nodes. As the node size increases, the number of publications increases. As the node color gets darker, the number of citations increases.

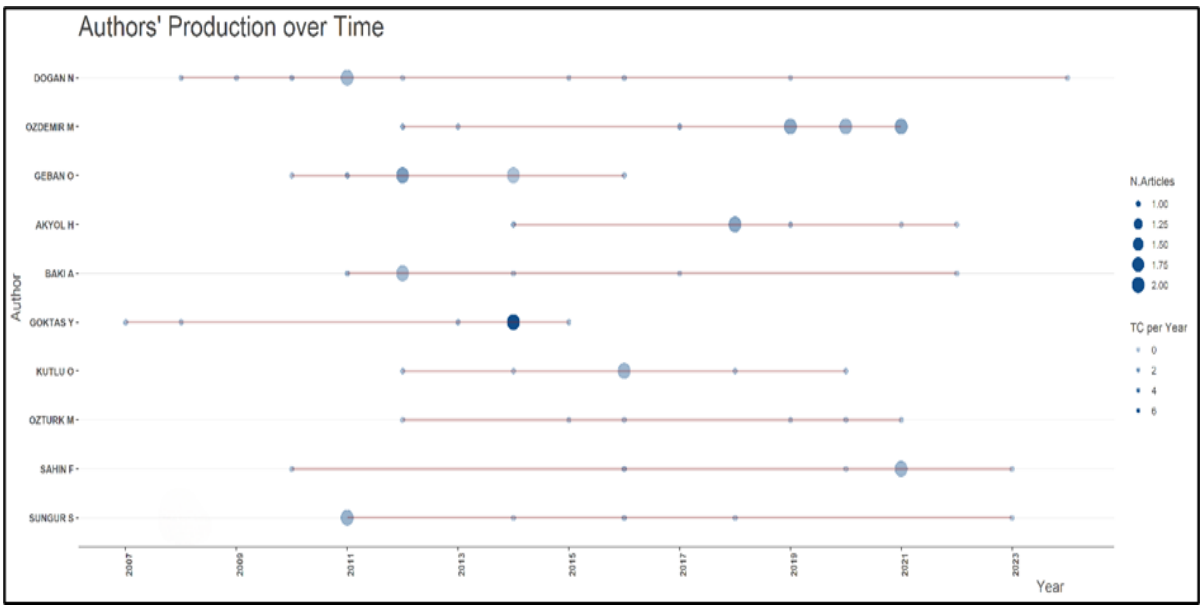


Figure 5. Distribution of the publications of researchers publishing in the Education and Science Journal according to years

Nuri Doğan is the most prolific contributor to the Education and Science Journal, both in terms of the total number of publications and the length of the time span across which these publications were produced. Murat Özdemir and Ömer Geban follow as the second and third most productive authors, respectively. Notably, Murat Özdemir published two articles in each of three consecutive years (2019, 2020, and 2021). Among the researchers with two publications, Yüksel Göktaş stands out with the highest total citation rate per year (see Figure 5).

The publication production rates of researchers publishing in the Education and Science Journal according to Lotka's Law are given in Figure 6. The graph of author productivity according to Lotka's law is a proportional graph showing how many publications authors contributing to a particular field have contributed. Also, this graph allows a quantitative prediction of the authors who will contribute to the relevant literature in the coming years.

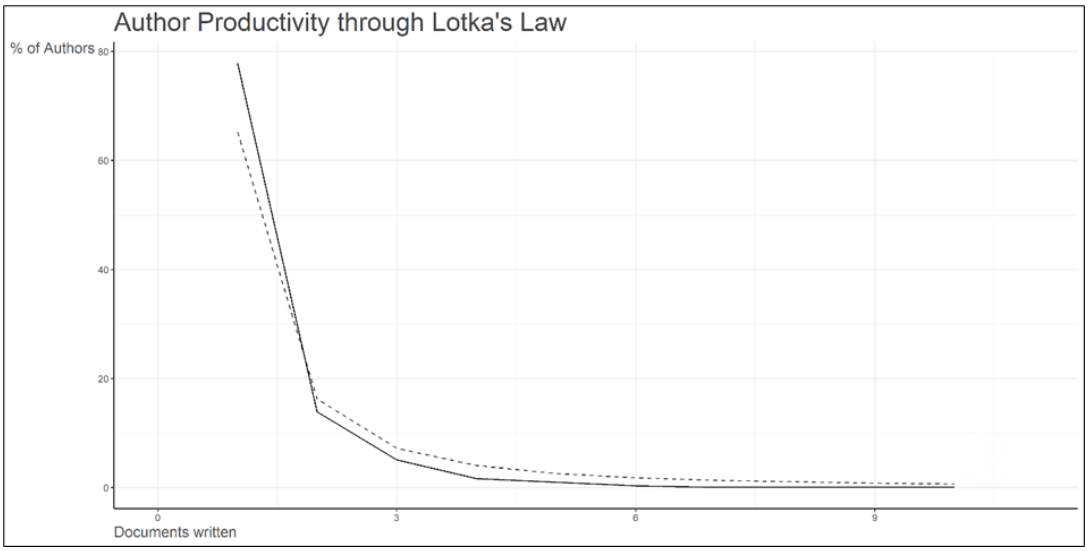


Figure 6. Proportion of researchers publishing articles in the Education and Science Journal producing publications according to Lotka's Law

Out of n=2,077 researchers who published in the Education and Science Journal, n=1,617 published only once. The rate of authors publishing a single article in the journal is approximately 80%, whereas n=289 researchers published two articles. The rate of these researchers is 14%. The remaining researchers published three or more articles (see Figure 6).

What topics and keywords emerge most frequently in the studies?

The ten most frequently used keywords in articles published in the Journal of Education and Science are shown in Figure 7.

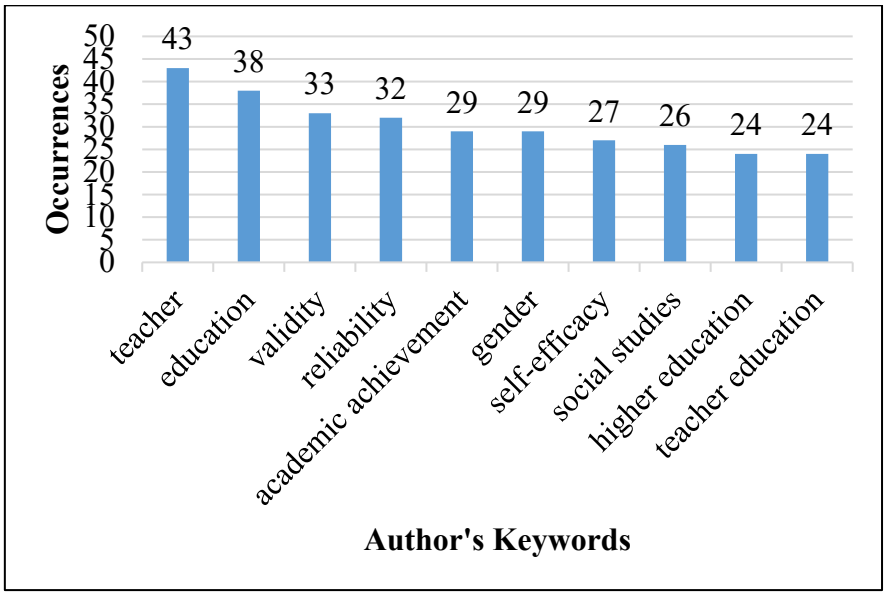


Figure 7. The ten most frequent author's keywords

The top ten most frequently keywords, depicted in Figure 7, include "teacher" (n=43), "education" (n=38), "validity" (n=33), "reliability" (n=32), "academic achievement (n=29)", "gender (n=29)", "self-efficacy (n=27)", "social studies (n=26)", "higher education (n=24)", "teacher education (n=24)". Accordingly, it is seen that most of the articles in the Education and Science Journal are related to the field of teaching. The word cloud consisting of these keywords is given in Figure 8.

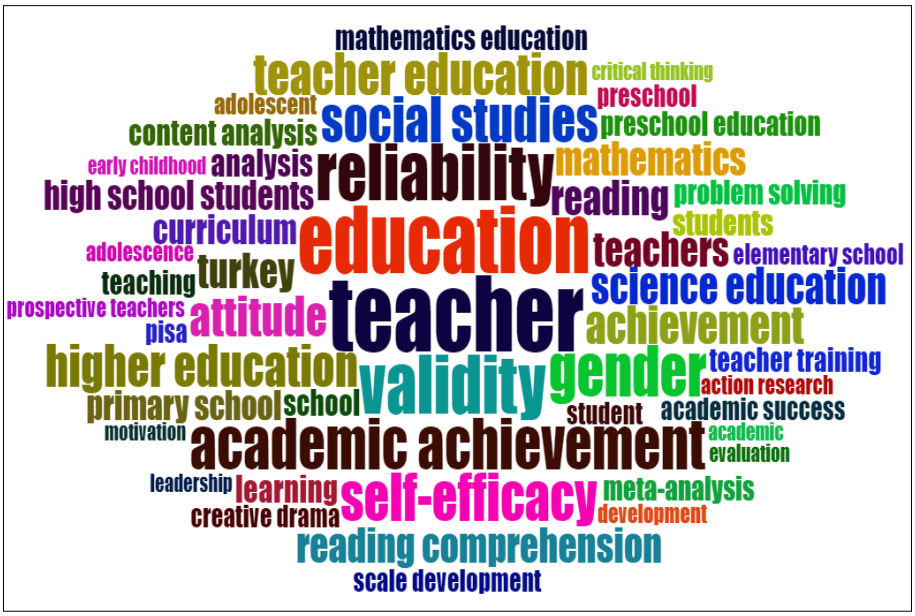


Figure 8. The most frequently used keywords in articles published in the Education and Science Journal

The word cloud in Figure 8 depicts just that. The concepts of "teacher" and "education" are frequently used as keywords in the articles in the journal. The change in the trending topics in the articles published in the Education and Science Journal by year is given in Figure 9.

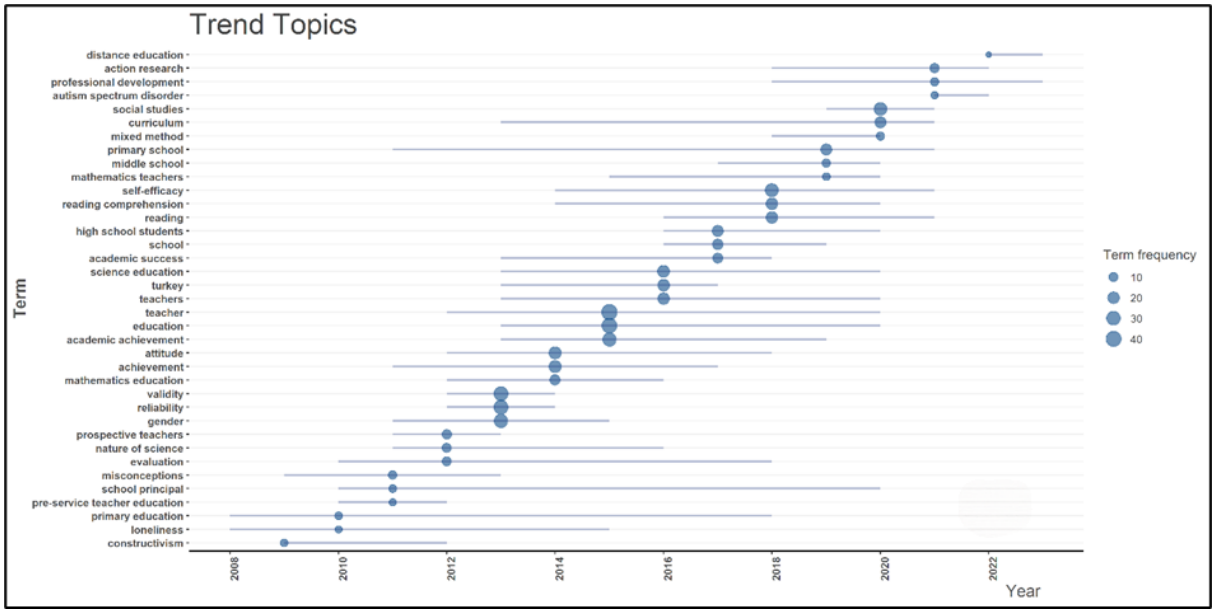


Figure 9. Changes in the trending topics used in articles published in the Education and Science Journal over the years

The temporal distribution of the trending topics used in the articles published in the Education and Science Journal is presented in Figure 9. The first topic used since 2008, when the journal was indexed in the WoS database, is the concept of "constructivism", which was frequently mentioned in education programs in those years. In recent years, the trending topical term due to the effects of the pandemic on the education and training process is the concept of "distance education". The most frequently used topics are the same as the keywords mentioned earlier. These are "teacher", "education", "academic achievement", "validity", "reliability", and "gender". These topics were found in 40 or more articles. According to the years, the topics with the longest lasting impact on the published articles are curriculum, primary school, school principal, and primary education. These topical areas show the dominant topics in the articles published in the Education and Science Journal.

Which institutions and countries are represented by researchers in articles published in the Education and Science Journal?

The top ten academic institutions and the number of articles published in the Education and Science Journal are presented in Table 7.

Table 6. Academic institutions and number of articles published in the Education and Science Journal

Authors' Institutional Affiliations	Articles
Hacettepe University	341
Ankara University	238
Gazi University	228
Anadolu University	109
Marmara University	75
Sakarya University	66
Abant Izzet Baysal University	59
Necmettin Erbakan University	58
Karadeniz Teknik University	56
Dokuz Eylül University	52

Table 7 depicts academic institutions and the number of articles published by their researchers. The highest number of articles in the Education and Science Journal is from Hacettepe University (n=341). Ankara University (n=238) ranked second, and Gazi University (n=228) ranked third. Because the contributions of these three universities to the field of education and their faculties of education have a long history, it is expected that these three universities come first. Many prominent educational scientists work in these universities. The distribution and co-authorship rates of the principal investigators who published articles in the Education and Science Journal according to their countries are given in Table 8.

Table 7. Distribution and co-authorship rates of articles published in the Education and Science Journal according to the affiliation countries of the principal investigators*

Country	Articles	Rate (%)	SCP**	MCP***
Türkiye	1,233	89.9	1,202	31
TRNC	13	0.9	10	3
USA	7	0.5	3	4
Canada	4	0.3	2	2
China	4	0.3	2	2
Malaysia	4	0.3	3	1
Serbia	3	0.2	2	1
Slovenia	3	0.2	3	0
Iran	2	0.1	1	1
Montenegro	2	0.1	1	1

*The table includes only the top ten countries. **Single Country Publications. ***Multiple Country Publications

The researchers responsible for publishing articles in the Education and Science Journal are mostly from Turkey (see Table 8). Almost 90% of the articles were written by researchers from Turkey. Accordingly, it is determined that Turkey is the dominant country in the journal. This is an expected situation since the journal is a publication originating from Turkey. Thirty-one of these articles were made with co-researchers from different countries. Turkey is followed by the TRNC with n=13 articles and the USA with n=7 articles. There are n=4 articles from Canada, China and Malaysia, n=3 articles from Serbia and Slovenia, and n=2 articles from Iran and Montenegro. The inter-country collaboration network of articles published in the Education and Science Journal is given in Figure 10.

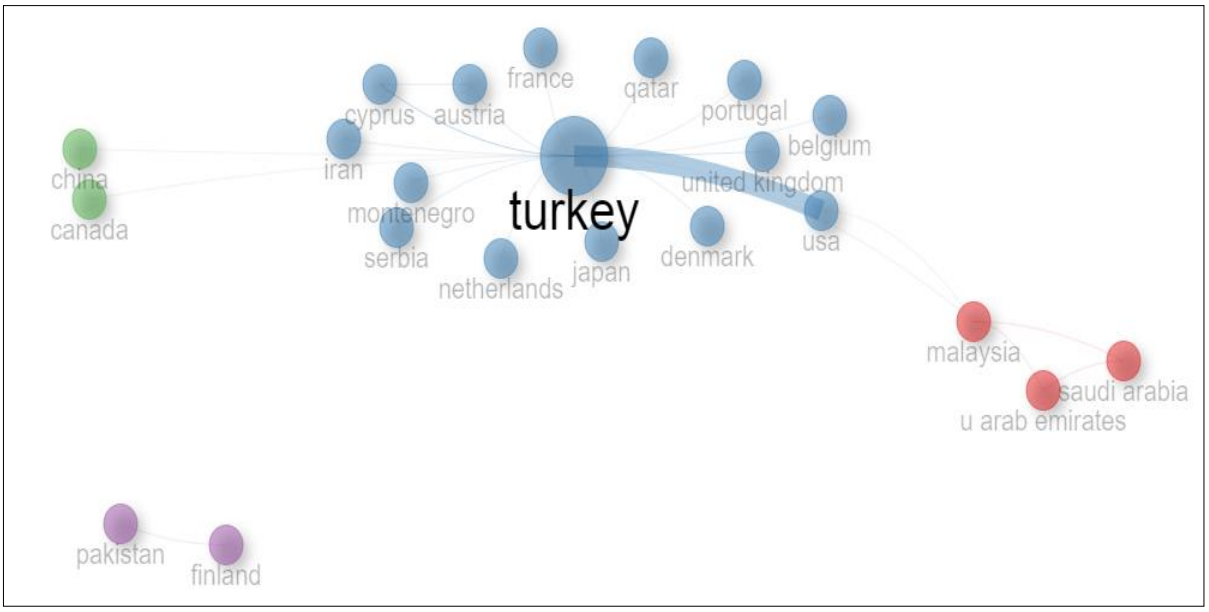


Figure 10. Cross-country collaboration network for articles published in the Education and Science Journal

Most of the articles published in the Education and Science Journal are jointly published between Turkey and the USA (see Figure 10). Turkey has produced articles with 16 other countries. These countries are TRNC, Iran, Montenegro, Serbia, the Netherlands, Denmark, Japan, the United Kingdom, Belgium, Portugal, Qatar, France, Austria, Canada, China, and Malaysia. There are also articles co-published by China and Canada, Pakistan, Finland, Malaysia, Saudi Arabia and the United Arab Emirates. This highlights the journal's commitment to international engagement in its publication practices.

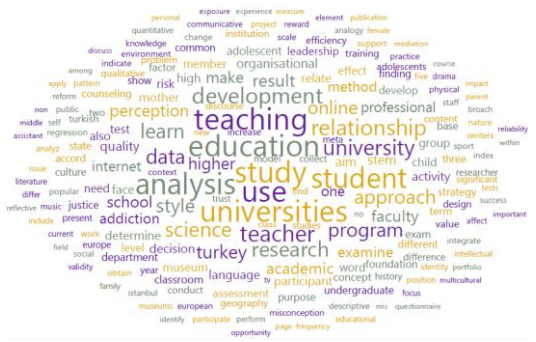
Topic Modeling Using Latent Dirichlet Allocation

The key topics in the articles published in the Education and Science Journal and the changes of topics over time were examined through topic modeling. Based on coherence and log perplexity values, the researchers reached a consensus on eight main topics. The subject terms that were a factor in determining these topics are given in Table 9.

Table 8. Main topics, topic terms and topic weighting ratios resulting from topic modeling

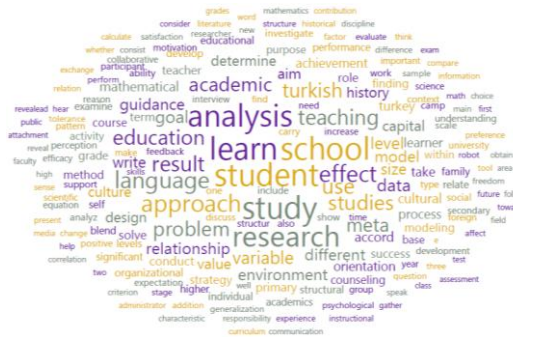
#	Topic name	Topic terms	Rate (%)
1	Education and Management in Higher Education	Study, use, education, universities, teaching, analysis, student, teacher, development, relationship	3.92
2	Innovative Approaches in Teacher Education and Teaching Skills	Teacher, education, student, working, using, teaching, self, service, skills, data	6.24
3	Language Teaching and Learning Approaches	Student, learning, study, school, analysis, research, approach, impact, language, use	6.40
4	Psycho-social Dynamics and Organizational Structures in the Educational Environment	Teacher, study, use, school, student, scale, analysis, data, research, results	7.49
5	Inclusion in Education and Education Policies	Education, teacher, study, student, school, use, research, data, child, inclusion	13.53
6	Enhancing Early Childhood Education and Skills	Study, reading, child, group, student, test, use, skills, teacher, education	18.39
7	Interdisciplinary Pedagogical Approaches	Student, study, teacher, use, research, group, science, data, school, analysis	20.72
8	The Effects of Psychological Factors on Student Success in Education	School, student, teacher, study, self, use, scale, analysis, data, success	23.31

The topics presented in Table 9, constitute the focus of the topic terms. There are eight different main topics created according to the topic terms. However, the weight ratios of the topics indicate the relative importance of the articles published in the Education and Science Journal. Accordingly, "The Effect of Psychological Factors in Education on Student Achievement" has the highest weight rate. The main focus of the Education and Science Journal is the articles within the scope of this topic. One of the most frequently used keywords in the bibliometric findings of the study is "academic achievement". These two findings are consistent with each other. The second most important topic was "Interdisciplinary Pedagogical Approaches" and the third was "Early Childhood Education and Enhancing Skills". "Innovative Approaches in Teacher Education and Teaching Skills" is the last topic in the relative importance order of the journal. In the light of these findings, it can be said that in the relative importance order of the articles published in the Education and Science Journal, student academic achievement emerges first, followed by studies related to teaching skills. The word clouds that are effective in the formation of these main topics are given in Figure 11.



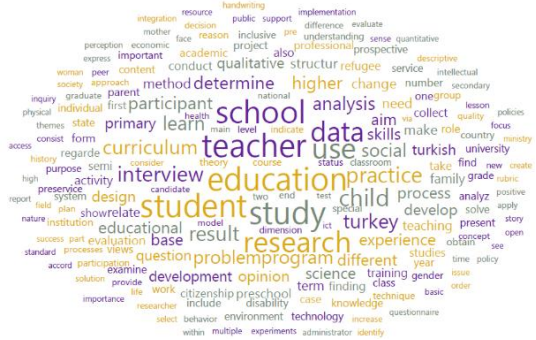
Topic 1: Education and Management in Higher Education

Topic 2: Innovative Approaches in Teacher Education and Teaching Skills



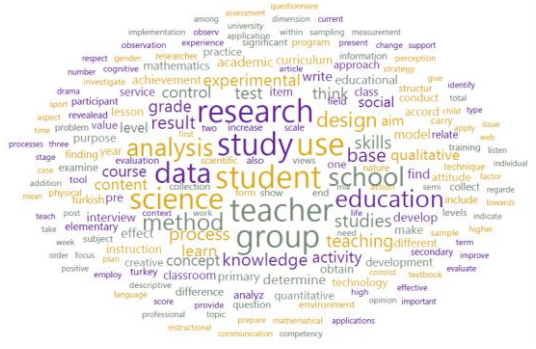
Topic 3: Language Teaching and Learning Approaches

Topic 4: Psycho-social Dynamics and Organizational Structures in the Educational Environment

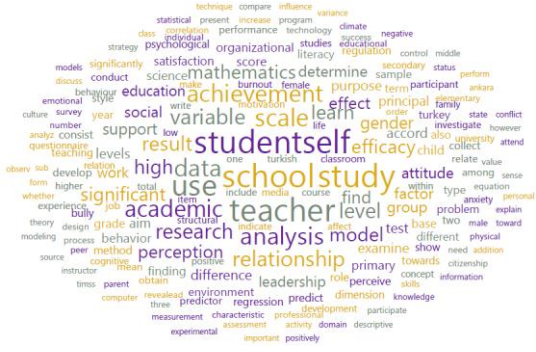


Topic 5: Inclusion in Education and Education Policies

Topic 6: Enhancing Early Childhood Education and Skills



Topic 7: Interdisciplinary Pedagogical Approaches



Topic 8: The Effects of Psychological Factors on Student Success in Education

Figure 11. Word clouds for main topics

Figure 11 depicts the keywords that define the composition of topic headings. The relative size and position of the keywords are determined by their frequency in the word cloud; the topic is named

based on the ten most frequent keywords. Five examples of articles with the highest weight in the relevant main topics are presented in Table 10. These articles can be accepted as evidence for the validity of the topics formed as a result of topic modeling.

Table 9. The imprint information of the articles published in the Education and Science Journal and collected under the main topics

Topic names	Articles' imprints
Education and Management in Higher Education	Dimici et al. (2016), Selekler-Gökşen et al. (2016), Uslu (2016), Üstünlüoğlu (2016), Zhou and Wu (2016)
Innovative Approaches in Teacher Education and Teaching Skills	Demirtaş et al. (2011), Erten (2022), Gündoğdu (2011), Temli et al. (2013), Ursavaş et al. (2014)
Language Teaching and Learning Approaches	Bican and Demir (2018), Indriyani et al. (2023), Genç (2014), Karababa and Karagül (2013), Mirici et al. (2010)
Psycho-social Dynamics and Organizational Structures in the Educational Environment	Ağaoğlu et al. (2012), Akman and Özdemir (2018), Buyruk and Akbaş (2021), Büyükşahin Çevik (2017), Kılınç (2014)
Inclusion in Education and Education Policies	Aslan (2021), Demir Başaran (2020), Gültekin Toroslu (2013), Şirin (2010), Zayimoğlu Öztürk (2021)
Enhancing Early Childhood Education and Skills	Gür et al. (2017), Özgün et al. (2020), Polat (2021), Tozduman Yaralı and Güngör Aytar (2020), Ünal and Aral (2014)
Interdisciplinary Pedagogical Approaches	Baran and Ata (2013), Kavacık et al. (2015), İlhan and Oruç (2019), Susar Kırmızı (2015), Uzun et al. (2022)
The Effects of Psychological Factors on Student Success in Education	Acar Güvendir (2014), Arslan (2016), Atik and Özer (2020), Hotaman and Yüksel-Şahin (2010), Ünsal Özberk et al. (2018)

Table 10 shows the topics under which the articles published in the Journal of Education and Science are grouped. These are the articles with the highest weight in the relevant main topics. At the same time, these articles can be accepted as evidence of the validity of the topics formed as a result of topic modeling.

What trends are observed in the number of citations over the 18-year period (2007-2024)?

The results suggest that there is no notable change in the distribution of articles across the topics. While there is an increase in the number of articles in some topics in certain years, there is a decrease in some years. However, when the total number of articles produced in the topics are analyzed, it is concluded that the highest number of articles are on "The Effects of Psychological Factors in Education on Student Success". This is followed by "Interdisciplinary Pedagogical Approaches" and "Early Childhood Education and Increasing Skills". The fewest number of articles in the journal are on "Education and Management in Higher Education". The distribution of the topics formed by the articles published in the Education and Science Journal over time is presented in Table 11.

Table 10. Distribution of the topics of the articles published in the Education and Science Journal

Topics	Years																		
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**Total**
Innovative Approaches in Teacher Education and Teaching Skills	3	2	6	7	7	5	9	15	8	9	4	0	4	2	4	2	2	1	90
Psycho-social Dynamics and Organizational Structures in the Educational Environment	0	1	2	3	5	10	12	16	6	6	7	5	9	2	8	6	3	0	101
Inclusion in Education and Education Policies	8	6	10	7	12	10	20	12	19	8	10	5	8	6	17	9	9	4	180
Interdisciplinary Pedagogical Approaches	12	13	12	13	15	17	19	22	29	19	18	10	17	27	16	14	10	6	289
The Effects of Psychological Factors on Student Success in Education	4	12	13	13	31	26	21	45	21	26	13	17	15	18	15	15	9	1	315
Education and Management in Higher Education	0	0	0	2	2	5	5	5	5	12	3	2	2	4	2	3	1	0	53
Enhancing Early Childhood Education and Skills	5	1	6	10	20	21	25	37	14	14	20	14	18	17	15	10	4	8	259
Language Teaching and Learning Approaches	0	4	6	4	3	6	4	16	10	4	5	7	7	4	3	0	2	0	85
Total	32	39	55	59	95	100	115	168	112	98	80	60	80	80	80	59	40	20	1372

The results suggest that the Education and Science Journal gives more importance to articles on increasing the academic achievement of students and different methodological approaches that serve this purpose, as well as articles related to early childhood, which are thought to affect academic achievement. The volumetric changes and trends of the topics of articles published in the Education and Science Journal over time are depicted in Figure 12.

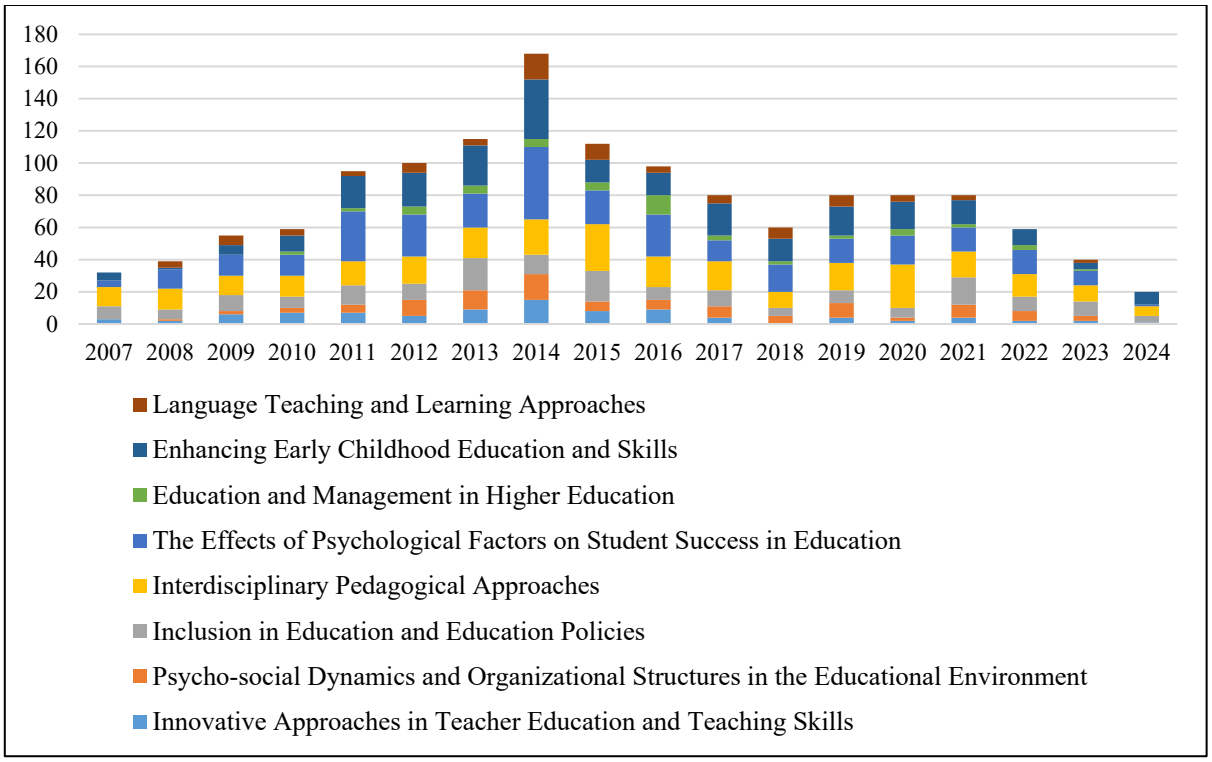
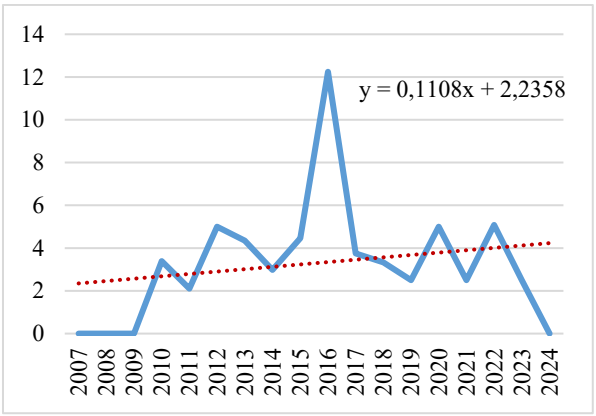
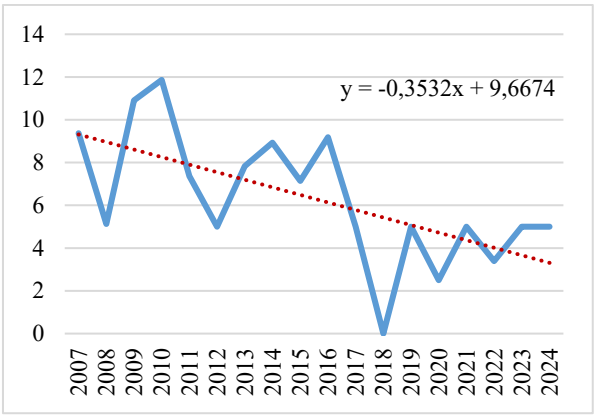


Figure 12. Distribution of the topics of the articles published in the Education and Science Journal

The volume of the topics in the Education and Science Journal has increased at some times and decreased at other times, especially between 2010 and 2015, when there was a significant increase in the number of articles in all topics (see Figure 12). When the trend lines of the topics are analyzed, it is seen that they remain constant horizontally. However, despite the temporal change in the Education and Science Journal, there is no change in terms of topic headings. Trend changes of the topics in the Education and Science Journal are given in Figure 13.



Education and Management in Higher Education



Innovative Approaches in Teacher Education and Teaching Skills

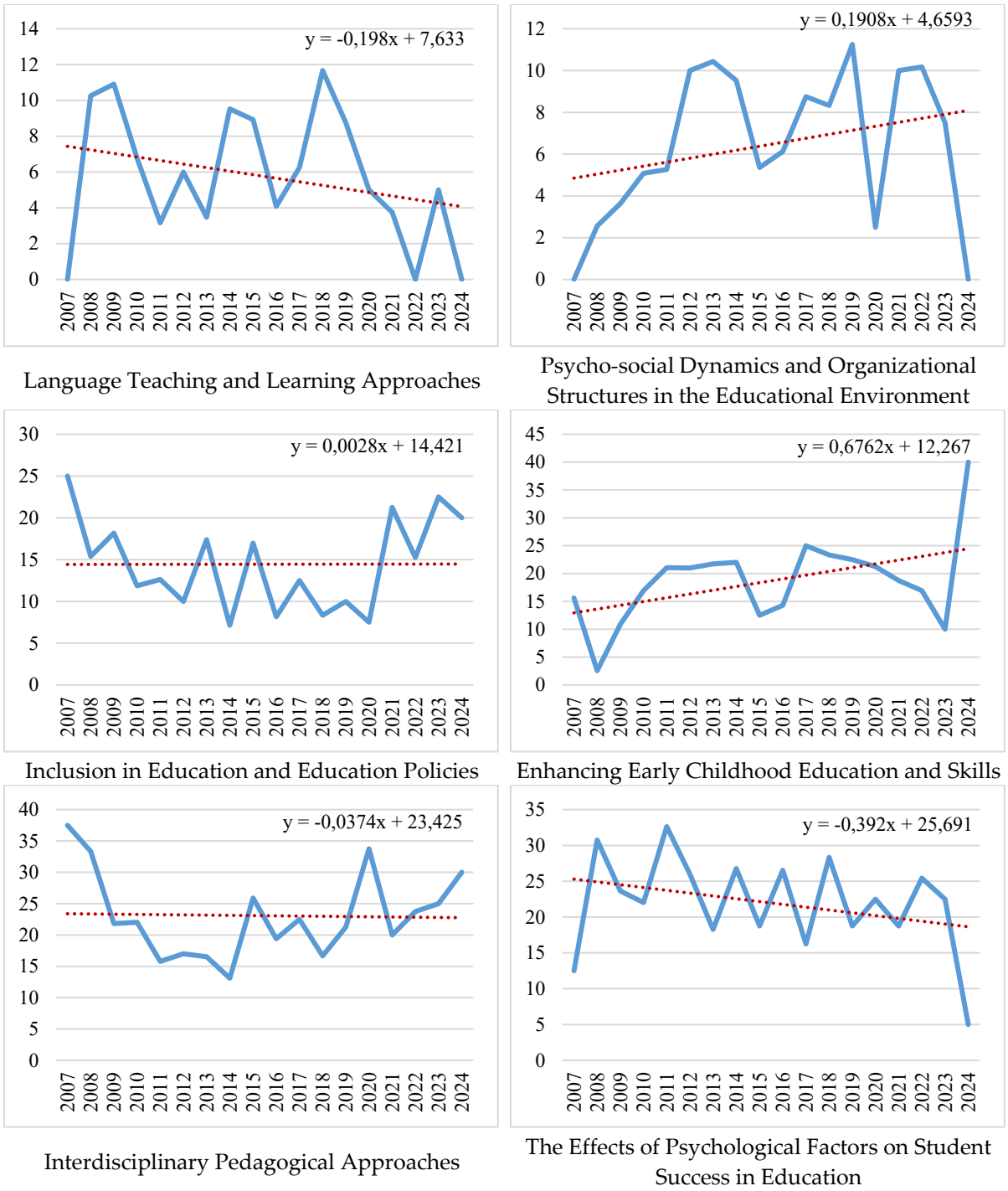


Figure 13. Trend changes in the topics covered by the articles published in the Education and Science Journal

Figure 13 depicts the trend changes in the topics over time. The trends of the topics in the Education and Science Journal either decrease, remain constant or increase over time. The trend slopes of the topics "Innovative Approaches in Teacher Education and Teaching Skills", "The Effects of Psychological Factors on Student Achievement in Education" and "Language Education and Learning Approaches" decrease; "Inclusion and Educational Policies in Education" and "Interdisciplinary Pedagogical Approaches" remain stable, while the topics "Psycho-social Dynamics and Organizational Structures in the Educational Environment", "Education and Management in Higher Education" and "Early Childhood Education and Increasing Skills" increase. However, when the slope graphs are analyzed, it cannot be said that the decreases or increases are very rapid.

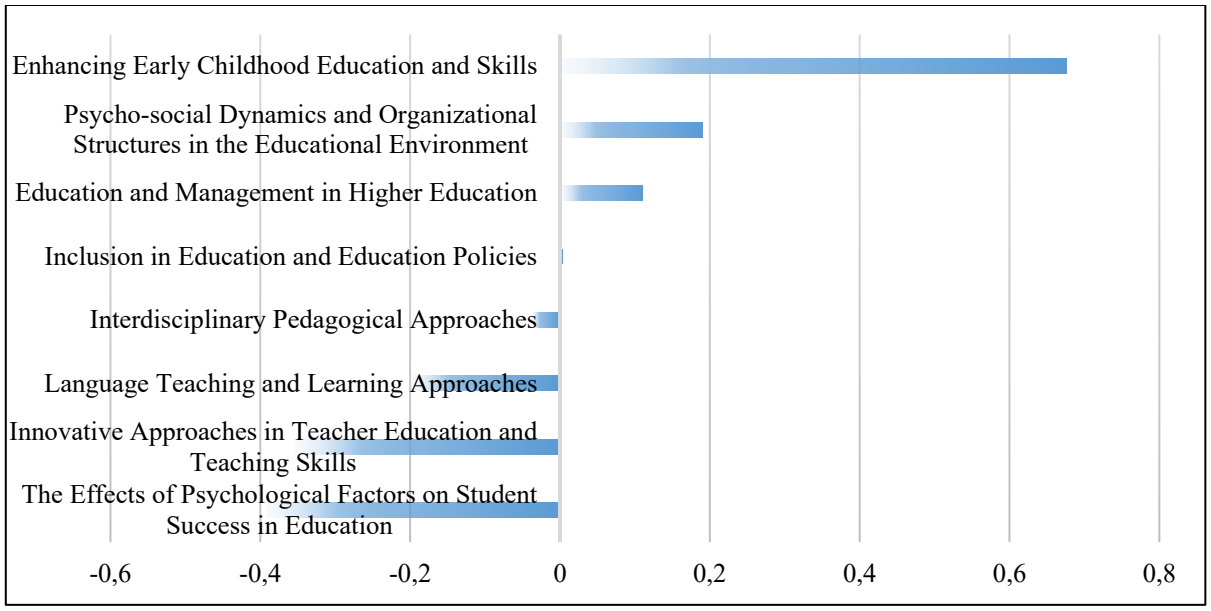


Figure 14. Momentum changes of the topics in the Education and Science Journal

Figure 14 highlights the changes in each topic in the Education and Science Journal compared to other topics. "Early Childhood Education and Increasing Skills", "Psycho-social Dynamics and Organizational Structures in the Educational Environment" and "Education and Management in Higher Education" have positive momentum values. Accordingly, it has been determined that these topics have gained relative importance compared to other topics. The acceleration value of "Inclusion in Education and Educational Policies" is close to zero. It cannot be said that there has been an increase or decrease in the importance of this topic. On the other hand, "Interdisciplinary Pedagogical Approaches", "Language Teaching and Learning Approaches", "Innovative Approaches in Teacher Education and Teaching Skills" and "The Effects of Psychological Factors in Education on Student Achievement" have negative values in terms of acceleration. It can be said that these topics have relatively lost their importance in the journal.

Discussion

In the previous section, we reported the results of comprehensive bibliometric analysis and topic modeling of articles published in the Education and Science Journal between 2007 and 2024 and answered the four research questions. In the following paragraphs, we summarize the results and highlight key insights. The sample size of n=1,273 articles are comparable to that of Altunışık (2023), who examined n=1,270 articles and Gülmez et al. (2021), who examined n=1,041 articles. It is also notably higher than Selçuk et al.'s (2014) analysis of n=492 articles and Doğan and Tok's (2018) study of n=181 articles published in the Education and Science Journal. As the most recent study, it integrates and confirms some earlier findings.

Compared to other journals in the field of educational research (Arici et al., 2019; Karagöz & Koç Ardıç, 2019; Karagöz & Şeref, 2019; Kutluca & Demirkol, 2016; Ünal, 2022) the Education and Science Journal publishes a higher-than-average number of articles, which allows it to be positioned as a significant contributor to educational research. However, due to a fluctuation in the annual article publication rates, the annual growth rate of the Education and Science Journal was found to be -2.73%. The analysis points to a decrease in the number of articles published by the Education and Science Journal in the recent period, which highlights an opportunity for improvement. The average age of the articles published in the journal is 8.77 years; it has been cited 7,390 times since being indexed by WoS. While the journal is mature and well-established at the national level, it is still emerging internationally. The fact that it is included in the Q4 (2024) /Q3 (2025) quartile in WoS denotes just that.

We identified Hacettepe University as the institution that publishes the most articles in the journal. Our results tally with those of Altunışık (2023), Doğan and Tok (2018), Gülmez et al. (2021), Selçuk et al. (2014), and Ünal (2022). These consistent results suggest that Hacettepe University is the leading institution in Turkey in the field of educational research. This may be attributed to the fact that Hacettepe University is a well-established institution. The results further highlighted two researchers from Hacettepe University who work in the field of measurement and evaluation in education. We have further noted the increased interest in articles in the field of measurement and evaluation. Moreover, in contrast to a study by Altunışık (2023), which identified Murat Özdemir from Hacettepe University as the most active researcher in the field, this finding was not confirmed by other studies including those by Doğan and Tok (2018), Gülmez et al. (2021) and Selçuk et al. (2014). However, the journal is primarily in demand from institutions in Turkey, as fewer papers are published by international institutions. This should be seen as part of the journal's ongoing improvement process, presenting a growth opportunity in pursuit of its vision to become a global leader.

Our analysis of the keywords also differed from that reported by Altunışık (2023). The most frequently used keywords in our sample were "teacher", "education", "validity", "reliability", "academic achievement", "gender", "self-efficacy", "social research", "higher education", and "teacher education". The infrequent use of terms such as "early childhood", "critical thinking", "leadership", "motivation", and "action research" suggests limited research on these topics. While there is some overlap in the keywords between Altunışık's (2023) paper and the present study, their frequencies were different. For example, the most frequently used keyword in Altunışık's (2023) study was "academic achievement" followed by "reliability, validity, teacher, gender, pre-service teachers, self-efficacy, higher education and structural equation modeling". In another analysis of the Education and Science Journal conducted by Ünal (2022), the most frequent keywords were "pre-service teacher, Covid-19, teacher, distance education, secondary school students and scale development". The variance may be attributed to the different methods used and changes in sample composition.

With respect to the countries represented by researchers in articles published in the Education and Science Journal; our results indicate that Turkey ranked first. This finding is consistent with that of Altunışık's (2023) and noted by Merigó et al. (2015). The result should not come as a surprise, as one would expect many researchers to prioritize journals published in their own language and country. However, international collaborations with Turkish co-authorship have been observed in our data. The country with the highest number of Turkish co-authors is the USA. The United States generally leads in educational science publications due to its extensive higher education system, research funding, and robust academic publishing infrastructure. The 2018 study titled "Scientific Publication Performance in Educational Sciences: G-20 Countries and Turkey," identifies the USA as the leading producer of educational science publications among G-20 nations (Selvitopu, 2018). Therefore, researchers tend to collaborate more with American colleagues.

The results of topic modeling similarly point to differences across studies. The most important topics identified in this study are teachers, education, academic achievement, validity and reliability, and gender. In a study by Selçuk et al. (2014), the key topics were the field of curriculum development and educational administration. In contrast, the most important topic identified by Altunışık (2023) was teacher opinions, followed by academic achievement, student perception, reading skills, teaching-learning conceptions and learning methods. Topic modeling conducted by Özcan and Akar (2024), though analyzing data from a different educational journal, identified educational sciences and administration as the main topics.

Topic modeling further identified eight topics. These include innovative approaches in teacher education and teaching skills, psycho-social dynamics and organizational structures in the educational environment, inclusion in education and education policies, interdisciplinary pedagogical approaches, the effects of psychological factors on student success in education, education and management in higher education, enhancing early childhood education and skills, and language teaching and learning approaches. These eight topics overlap with the focus and scope of the Journal of Education and Science, which aims to publish studies that contribute to educational activities at all levels, from pre-school education to higher education, and supports the professional development of teachers and academics (Eğitim ve Bilim, 2024). Researchers prefer the Journal of Education and Science due to its broad topical scope. The emerging topics align with the themes and key concepts discussed in the studies by Selçuk et al. (2014) and Altunışık (2023). In Turkey, teacher training and the continuous improvement of teaching skills are the responsibility of education departments affiliated with universities. We argue that it is important to discuss issues related to teacher education and the enhancement of teachers' professional skills in the Education and Science Journal.

The role of educational administration is critical not only for designing educational frameworks and drafting policies but also for maintaining the quality and effectiveness of the educational system. It is a key department in graduate programs at faculties of education, with the second-highest number of academics compared to other education fields (Council of Higher Education [CoHE], 2024). As a result, studies in educational administration offer valuable insights into how educational policies are developed and implemented, from the top levels of government to schools and classrooms. For educational administration to become a relevant discipline, it should strive to develop original approaches to a variety of managerial problems (Eacott, 2015). Studies in this field should take a pragmatic stance and address practical problems by considering the unique economic, political, cultural, and social characteristics and challenges of society, rather than repeating popular slogans (Takmak, 2019). The high ranking of educational administration research in the journal is likely a result of the number of publications in the field.

Inclusive education has emerged as an important topic and can be defined as a process that ensures all children receive education aligned with their developmental, sociocultural, and individual needs. The journal Education and Science (2024) also aims to promote inclusion in education. The inclusion of articles on this topic in the Education and Science Journal underscores the importance of inclusive education as an issue requiring urgent solutions. Increasing children's accessibility and fostering participation, while reducing potential discrimination are among the main goals of inclusive education according to (Ministry of National Education [MoNE], 2024). Furthermore, it has been repeatedly stressed that childhood experiences have a lasting impact on individuals' cognitive abilities, personalities, and social behaviors (Bredekamp, 2015; UNICEF, 2003). Some have noted that it is important to continuously renew assessment methods and tools to ensure the needs of child development are met (Tunçeli & Zembat, 2017).

Perhaps many of these issues could be addressed by employing interdisciplinary pedagogical approaches, identified as a topic in our analysis. Today, programs are no longer designed around a single subject area but rather combine multiple disciplines with the aim of providing hands-on experience. This is evident in recent curricula prepared by MoNE (2024), which emphasizes STEM and STEAM-based program and activity proposals (Özcan, 2021a; 2021b; 2023a; 2023b) and promotes a holistic education approach (Altan & Yıldırım, 2022). In particular, STEM applications have become a cornerstone of modern science education. Teaching STEM requires one to adopt an interdisciplinary approach, which enables its use across different ages and academic levels, from primary school to university (Özcan & Koca, 2019). The Journal of Education and Science notably lacks interdisciplinary studies. We argue that the inclusion of studies prepared with an interdisciplinary approach in the Education and Science Journal will increase the impact of the journal in literature.

Language education—an interdisciplinary field—cultivates both communicative competence and intercultural awareness. Communication-based approaches emphasize meaning-making over grammatical structure in language teaching (Richards, 2006). Furthermore, language education should not be confined to the narrow path of learning foreign languages. Turkey has developed several foreign language learning strategies (Soner, 2007), and the teaching of Turkish as a second language has gained increasing interest. Research into strategies for enhancing reading comprehension, a key issue identified in international assessments, should be addressed within the broader context of language learning. For this reason, the Journal of Education and Science should include not only studies on foreign language teaching, but also those that emphasize the importance of pedagogical content knowledge in language teaching, as well as studies that evaluate Turkish as a foreign language. Recognizing the importance of language education, the Journal of Education and Science features language teaching and learning approaches, helping to bridge a potential gap in interdisciplinary studies.

One may argue that higher education plays an important role in shaping a country's future by providing opportunities for personal growth and fostering its human potential. To develop a skilled and effective workforce, higher education policies must be designed with utmost care, proactively addressing challenges and providing opportunities for continuous improvement. To ensure success in global competition, higher education has gained increasing importance. This has led to rapid growth in the number of institutions, a trend seen in Turkey, where higher education has expanded significantly. Aydın et al. (2017) caution that an increase in quantity does not always lead to improved quality, and if the rise in quantity is not accompanied by quality, it can result in new problems. A quick search reveals that there are many academic journals in the field of educational sciences in Turkey. Although the exact number varies depending on the criteria and search period, one may estimate that there are approximately between 25 and 33 such journals (Danişman et al., 2016). Only one of these journals, Education and Science, is included in an internationally recognized index (WoS-SSCI). Other journals in the field are expected to be included in international indexes by following similar policies and publishing articles on a variety of topics.

Our findings also suggest that there are topics not covered by the Journal of Education and Science. These include lifelong learning, informal learning, artificial intelligence and the use of generative AI in education, pedagogical content knowledge, TPACK, educational comics, formative assessment and evaluation practices, educational policies developed at national and international level, and innovative education in the androgogy and gerontology process. We consider the absence of discourse on these topics as potential gaps that would be beneficial for the journal to address. Expanding the scope and inviting articles on these topics would contribute to the "focus journal" approach outlined in the journal's purpose statement.

Conclusion

In the previous sections we outlined the results of a bibliometric analysis and topic modeling (2007-2024) of n=1,372 papers published in the Education and Science Journal (Eğitim ve Bilim); a leading peer-reviewed journal published by the Turkish Education Association. It is the only journal in Turkey indexed in the SSCI category of the WoS, which publishes educational research in both Turkish and English languages. However, the journal is primarily engaged with by Turkish academics, rather than by researchers from other countries, although some international collaborations have been noted. This may explain the recent decline in the citation rate of the journal. We argue that the journal should take note and reposition itself as a global education journal rather than a national one.

As well, there are other reasons why it is the only journal from Turkey included in the WoS SSCI index. The wide range of topics covered in the journal's publication purpose and scope is seen as a reason for researchers to prefer it over others. The eight topics that emerged in the publication trend are an indication of this. Moreover, the journal's rigorous peer-review process, which ensures high-quality scholarship, undoubtedly contributes to its prestigious standing. The editorial board, composed of internationally recognized experts in their respective fields, further bolsters the journal's credibility and attracts submissions. Its commitment to publishing original research that advances knowledge, coupled with its accessibility to a broad audience, solidifies its position as a leading source of scholarly work and likely factors into its unique inclusion in the WoS SSCI index from Turkey.

To be indexed in the Social Sciences Citation Index (SSCI) by Clarivate Analytics, a journal must pass a rigorous evaluation (Clarivate Analytics, 2023). While the Journal of Education and Science has successfully completed this process, further improvements are needed to meet international standards and enhance its standing. To reduce bias and encourage submissions from new researchers and international scholars, the journal's publication policy should be updated with revised criteria, aims, and scope.

To mitigate the journal's limited growth rate, we suggest expanding its scope and publishing special issues on topics that are currently underrepresented, in order to increase the number of articles. We anticipate that this will effectively elevate the journal to a position where it can engage with educational issues on a global scale.

Limitations

The scope of the research, the database selected as the sample, the analyses performed, and the programs used in performing these analyses constitute the limitations of this study. The study was limited only to the articles indexed in WoS and published between the specified dates. Since the Education and Science Journal is still in the process of publication, new articles are being produced. With the inclusion of these articles in the study, the findings obtained may vary and the topics may differ. In addition, the use of the Bibliometrix package written in the R programming language in the bibliometric analysis part of the study and the application of the LDA technique in the topic modeling analysis are also limitations of this study in terms of analysis methods. Because the basic method in bibliometric analysis and topic modeling studies is to create models based on the frequency of words. It should be taken into consideration that the algorithms in these analysis programs do not always give complete and reliable results. The LDA technique for topic modeling analysis has recently been seen as important and up-to-date and has been popularly used in many studies. Its use in this study can be seen as a limitation. Therefore, different topic modeling techniques should be used, and the results should be compared.

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