A Bibliometric Analysis of Studies on Excellence in Education

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Abstract

The aim of this study is to conduct a bibliometric analysis of academic publications focusing on the theme of "excellence in education" between the years 2010 and 2024. Designed as a descriptive and network-based bibliometric study, this research is based on publications retrieved from the Web of Science (WoS) database using specific keywords, namely educational excellence, teaching excellence, academic excellence, instructional quality, and quality in education. The sample includes peer-reviewed articles written in English and Turkish within the field of educational sciences. Data analysis was carried out using the Bibliometrix R package, and various bibliometric dimensions were examined, including publication trends, prolific authors and institutions, collaboration networks, keyword clustering, and the most frequently cited publications. The findings indicate that the theme of "excellence in education" has gained particular prominence over the past 15 years, especially in the context of higher education. Among the most frequently encountered sub-themes are instructional quality, assessment processes, and quality assurance. It is also noteworthy that multi-authored and internationally collaborative publications tend to receive higher citation counts. This study aims to contribute to the formulation of educational quality policies and to provide a strategic roadmap for future research.

Keywords: Educational excellence, instructional quality, academic excellence, bibliometric analysis.

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Introduction

Education is a dynamic process through which individuals acquire knowledge, skills, and values, fostering both personal and societal development. One of the prominent contemporary educators, John Dewey, defines education as "not preparation for life, but life itself. Education is growth. Education is the continuous reconstruction of experience. Education is a social process" (Ersözlü, 2009). Education is comprehensive, multidimensional, dynamic, universal, and continuous, grounded in scientific research and findings. This process enables individuals to realize their intellectual, social, and emotional potential, while also contributing to the economic and cultural advancement of societies.

In contemporary discourse, education is closely associated with the concepts of quality and excellence. Particularly in the context of higher education, sub-themes such as instructional quality, assessment processes, and quality assurance are emphasized. The concept of excellence in education extends beyond academic achievement; it also encompasses the quality of learning environments, the effectiveness of instructional methods, and the satisfaction of stakeholders (Kırmızı & Duban, 2017). Excellence in education has emerged in the literature as a multifaceted concept aimed at enhancing the quality of both educational processes and outcomes. It includes various elements such as instructional effectiveness, learning environment quality, student success, and institutional quality assurance.In recent years, globalization and technological advancements have further underscored the importance of educational excellence. Higher education institutions, in particular, have intensified efforts to define and evaluate quality standards. In this context, educational excellence represents a continuous pursuit of improvement and innovation at both individual and institutional levels.

Excellence in education holds strategic importance in contemporary education systems in terms of teaching quality, quality assurance, and improving student achievement. Particularly in higher education, international rankings, accreditation processes, and quality standards compel institutions to develop excellence-focused policies. As emphasized in UNESCO's Global Education Monitoring Report, quality is a critical dimension that must be addressed not only in terms of access but also in terms of learning outcomes and sustainable development goals (UNESCO, 2015). Similarly, the World Bank highlights the importance of quality-focused approaches by drawing attention to the learning crisis in education (World Bank, 2018). However, there is limited comprehensive analysis in the literature on how this concept is addressed, the sub-themes around which it has taken shape, and how it has evolved over time. This creates a significant gap in both theoretical discussions and the direction of education policies. This research was conducted to fill this gap and systematically reveal the trajectory of the concept of excellence in education in the academic literature.

The concept of excellence in education represents not only an abstract ideal but also a multidimensional approach shaped through different theoretical paradigms. In this context, theoretical models developed on how the concept of quality is defined and measured are at the center of discussions on excellence. For example, the Total Quality Management (TQM) approach, pioneered by Deming, addresses quality in educational institutions at a managerial level by emphasizing continuous improvement, stakeholder participation, and process orientation. The SERVQUAL model, on the other hand, is based on the service quality scale developed by Parasuraman and colleagues and makes it possible to measure teaching quality based on the difference between students' expectations and perceptions. In addition, the Outcomes-Based Education (OBE) approach, developed under Spady's leadership, defines quality directly through students' learning outcomes and performance indicators. These theoretical models reveal that excellence in education is not only an institutional or pedagogical goal but also a measurable, assessable, and continuously developable process. Therefore, the theoretical framework of the study has been strengthened by building on widely accepted models such as TQM, SERVQUAL, and OBE, ensuring both conceptual integrity and the integration of findings with the international literature.

The term "bibliometrics" was first introduced by Alan Pritchard in 1969 (Zeren & Kaya, 2020). Pritchard defined bibliometrics as the application of mathematical and statistical methods to books and other communication media (Al & Coştur, 2007). The earliest bibliometric study in the

literature was conducted by Cole and Eales in 1917, while the first bibliometric research in Turkey was carried out by Özinönü in 1970 (Depren et al., 2018). Bibliometric methods aim to analyze the structure and evolution of a research field by examining publication trends, author and institutional collaborations, keyword clusters, and citation networks. Such studies play a crucial role in revealing the intellectual structure of a discipline, identifying trends and gaps in the literature, and guiding future research directions. One of the main advantages of bibliometric analysis is its ability to provide an overarching profile of a research field, which is highly valuable for identifying influential studies and major trends over time (Koçyiğit et al., 2023). In the field of educational sciences, bibliometric analyses are increasingly employed to explore the development of specific themes and to offer strategic insights to policymakers.

The most important data sources in bibliometric research are international citation indexes such as the Science Citation Index (SCI), the Social Sciences Citation Index (SSCI), and the Arts & Humanities Citation Index (A&HCI). Access to these indexes is provided through the Web of Science Core Collection database (Güzeller & Çeliker, 2017). WoS is a multidisciplinary and reliable database that indexes high-quality academic publications worldwide. It offers access to peer-reviewed articles in the field of educational sciences and provides comprehensive filtering options and citation analysis tools, making it an ideal platform for bibliometric studies.

While bibliometric methods are widely used in various areas of the social sciences, they have also gained increasing attention in the field of education. Despite the growing emphasis on the concept of excellence in education—especially in relation to efforts by higher education institutions to strengthen their quality assurance systems—bibliometric studies in this area remain limited. Existing research is often confined to specific geographic regions or levels of education, highlighting the need for a systematic and global investigation of the theme of educational excellence over an extended time frame.

The concept of excellence in education has become a strategic phenomenon at the center of both national and international education policies and academic debates in recent years. Globalization, international ranking systems, quality assurance mechanisms, and reforms aimed at improving student achievement have led to this concept coming to the fore in various contexts, from higher education to basic education. However, a comprehensive assessment of the sub-dimensions in which the concept of excellence is addressed, the academic and institutional actors who produce it, and the direction it has taken over time remains limited.

The main rationale for this research is to fill this gap in the literature and systematically map academic production on the theme of "excellence in education" between 2010 and 2024. The year 2010 marks one of the periods when the concepts of quality and "excellence" in the field of educational sciences began to gain prominence at the international level. In particular, the Bologna Process's requirement for quality assurance systems in higher education policies after 2010 led to a noticeable increase in the literature from this date onwards. Therefore, 2010 serves as a theoretical and historical turning point as the starting point for the analysis.

This examination, conducted through bibliometric analysis, aims not only to reveal the academic reflections of the concept but also to develop quality policies in education, determine strategic priorities related to teaching excellence, and establish a theoretical foundation that will guide future research. Furthermore, it seeks to contribute to the development of educational quality policies and to provide a strategic roadmap for future research. By examining the impact of multi-authored and internationally collaborative publications on citation performance, the study also aims to shed light on the dynamics of scholarly collaboration in the field of educational sciences.

Research Questions

This study aims to address the following research questions to understand the structure and development of the literature on the theme of educational excellence:

- How are academic publications on educational excellence distributed over the years?

- Who are the most prolific authors, institutions, and countries in this field?

- Which keywords stand out in the theme of educational excellence, and how are they clustered?

- What are the characteristics of the most frequently cited publications?

- How do multi-authored and internationally collaborative publications influence citation performance?

Method

Research Design

This study adopted a bibliometric analysis approach to systematically examine the academic literature on the theme of educational excellence. In this context, the research design combines descriptive and network-based bibliometric analyses. Descriptive analysis was employed to investigate basic bibliometric indicators such as publication trends, prolific authors, and institutions. Network-based analysis was applied to visualize and evaluate relational structures such as author collaborations, keyword clustering, and citation networks. This dual approach aims to provide a comprehensive understanding of both the overall trends and the underlying connections within the literature on educational excellence.

Data Source

The Web of Science (WoS) database was selected as the data source for this study. WoS was preferred because it is considered the "gold standard" for bibliometric analyses due to its high scientific validity, inclusion of journals indexed under rigorous criteria, standardized metadata, and integration with comprehensive tools for citation networks and trend analyses. Data integrity and standardized subject knowledge are critical in bibliometric analyses. WoS provides high selectivity and reliability, particularly in the field of education sciences, through its SCI, SSCI, and ESCI indexes (Mongeon & Paul-Hus, 2016). Although databases such as Scopus or Google Scholar have broader coverage, this breadth can also create issues of low selectivity and data accuracy. Therefore, the preference for WoS in this study is a conscious choice made to ensure data accuracy, the reliability of bibliometric indicators, and international comparability.

To access publications related to the theme of educational excellence, the following keywords were used: educational excellence, teaching excellence, academic excellence, instructional quality, and quality in education. Keywords were selected based on the principles of representativeness and validity (Zupic & Čater, 2015). First, the most frequently encountered concepts in the literature ("educational excellence," "teaching excellence," "academic excellence," "instructional quality," "quality in education") were examined, and then the search results in WoS were tested with pilot analyses. During this process, both the narrowing and broadening effects of the concepts were taken into account, and overly technical or rarely used terms were excluded. Therefore, the selected keywords were determined to cover both the central themes in the literature and the commonly used concepts in practice.

Sampling Criteria

The study sample consists of peer-reviewed articles indexed in the Web of Science under the Education and Educational Research category. The sample includes only articles published in English and Turkish, while other publication types—such as book chapters, theses, conference proceedings, and editorials—were excluded. The reason for selecting English and Turkish as the languages of the study is to analyze global-local interaction by including publications in English, the dominant language of the international literature, on the one hand, and Turkish publications representing the local context on the other. Publications in other languages have been excluded from the scope as they are both limited and restricted in terms of accessibility. Furthermore, the reason for selecting only the "Education and Educational Research" category is to focus the research primarily on depth within the field of educational sciences rather than on interdisciplinary breadth. This approach ensures that the findings contribute more directly to discussions on educational policies and teaching excellence. This

decision was made to focus the analysis specifically on scholarly production in academic articles and to ensure consistency across the dataset.

Data Analysis

For bibliometric analysis and visual mapping, the Bibliometrix package in the R programming environment was utilized. R is a software environment designed for statistical computing and graphical analysis and has become increasingly popular for data-driven analytical research (Aylan, 2021). Bibliometrix provides a comprehensive suite of tools for conducting bibliometric analyses and is integrated into the R environment as an open-source package.

The study examined annual publication counts and growth rates to evaluate the development of the theme over time. The most productive authors and institutions were identified, and their influence within the field was analyzed. National and international collaborations among authors and institutions were visualized and assessed using network analysis techniques. Keywords used in publications were analyzed to reveal thematic clusters and research foci. Additionally, the most frequently cited publications and citation networks were examined to evaluate influential works and knowledge flows in the field. Descriptive statistics and network visualizations were generated using the built-in functions of Bibliometrix. Data cleaning and preprocessing steps—including the removal of duplicate entries and ensuring data consistency—were meticulously conducted. Publications retrieved through the keyword search were systematically screened, and those not meeting the inclusion criteria were eliminated. Standard methods accepted in bibliometric analyses were used in the data cleaning process (Aria & Cuccurullo, 2017). First, different spellings of the same author (e.g., "Smith, J." and "Smith, John") were merged using the author name disambiguation method. Inconsistencies in institution names were corrected using the affiliation unification process, and duplicates were automatically removed based on article title and DOI number. Additionally, records with missing metadata were identified as a cleaning criterion. This detailed process was carried out in accordance with the principles of research reproducibility and data reliability. These procedures were implemented to enhance the reliability and comprehensiveness of the study.

By their very nature, bibliometric studies are methodologically oriented toward quantitative data analysis. The publication count trends, collaboration networks, citation analyses, and keyword co-occurrences conducted using the Bibliometrix R package constitute the quantitative dimension of the study. However, the absence of qualitative content analysis is considered a limitation. However, the aim of the study is not to discuss the concept's content but to reveal the production, impact, and network structures in the literature. Therefore, the methodological choice is justified as it is consistent with the aim and scope of the study. Future research should support these findings with thematic content analysis.

Findings

The articles analyzed within the scope of this study are evaluated based on several criteria, including their distribution by year, the most prolific authors, co-authorship networks, the most cited studies, the countries with the highest number of publications, the most frequently cited references, and the most recurring keywords. In addition, various network maps are presented to illustrate these findings.

a) General Bibliometric Indicators

This study covers 1,024 documents indexed in the Web of Science (WoS) database between 2010 and 2024. These documents were collected from 370 different sources (e.g., journals) and authored by 2,558 contributors. Table 1 summarizes the key bibliometric indicators of the study.

Table 1

Bibliometric Indicators of Studies on Educational Excellence (2010–2024)

Indicators	Value
Analyzed Time Frame	2010–2024

Total Number of Sources	370
Total Number of Documents	1024
Total Number of Authors	2558
Number of Single-Authored Documents	223
Number of Authors' Keywords (DE)	2934
Total Number of References	42,194
Average Document Age (years)	5.95
Average Citations per Document	15.75

As shown in Table 1, a total of 1,024 documents were published during the analyzed period, with an average document age of 5.95 years. The average number of citations per document is 15.75, indicating the influence of publications on educational excellence in the field. Moreover, with contributions from 2,558 authors, the proportion of single-authored documents is relatively low (223 authors), suggesting that the majority of the publications are multi-authored.

b) Distribution of Publications by Year

Figure 1 illustrates the annual scientific production in the field of educational excellence between 2010 and 2024.

Figure 1

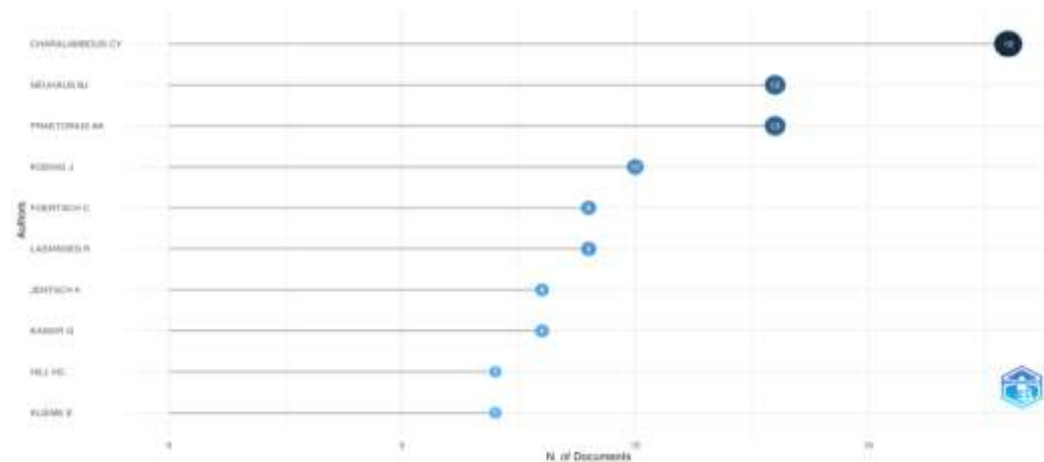*Trends in Publications Over Time*

An examination of Figure 1 reveals a significant upward trend in the number of publications. While approximately 25 articles were published in 2010, this number increased to nearly 110 by 2023. Although there was a noticeable decline in 2013, a sharp increase is observed from 2015 onward. After 2018, the growth rate slowed, resulting in a relatively stable trajectory. The peak was reached in 2023, reflecting heightened academic interest in topics such as educational quality, student achievement, and the development of instructional methods. The sharp decrease observed in 2024 may be due to incomplete data collection or the year not yet being finalized. Overall, the findings indicate that educational excellence has increasingly become a focal point of academic research.

c) Prominent Authors

The most prolific authors in the field are presented in Figure 2.
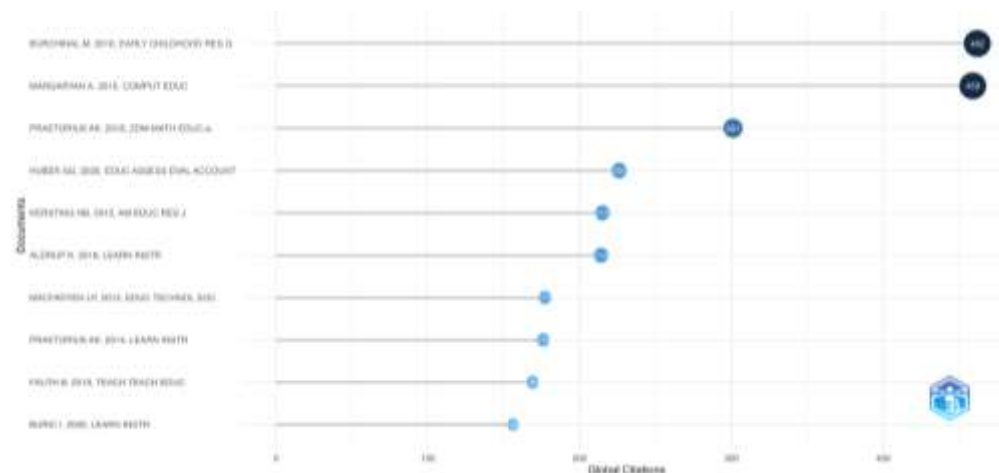
Figure 2

Most Prolific Authors

According to Figure 2, Charalambous C.Y. stands out as the most productive author with 18 publications. The prominent position of Charalambous C.Y. suggests that this author is one of the leading contributors shaping the field. Neuhaus B.J. and Praetorius A.K. share the second position with 13 publications each. Other highly productive authors include Koenig J. (10 publications), Foertsch C. (9 publications), and Lazarides R. (9 publications). These findings indicate that research on educational excellence is largely driven by a select group of leading scholars.

d) Most Cited Publications

The most highly cited studies are shown in Figure 3.
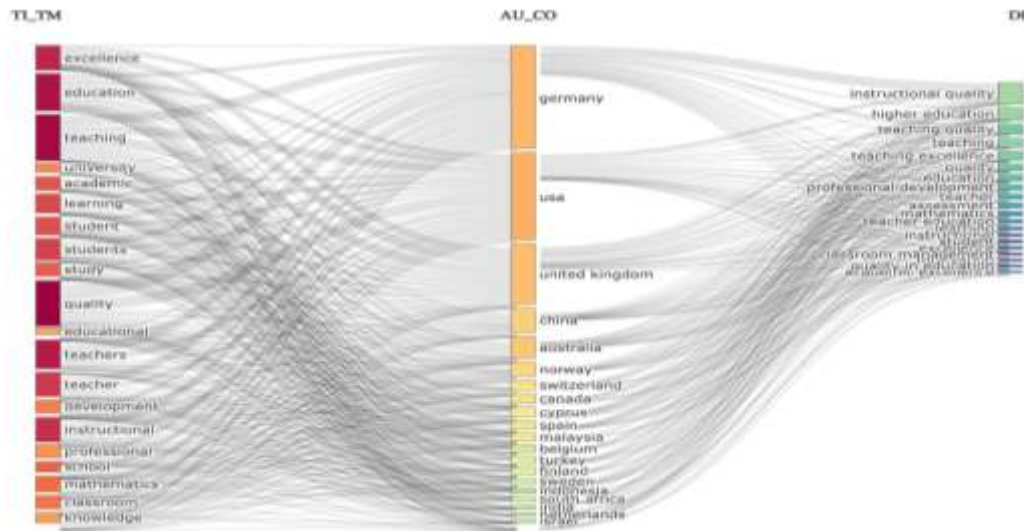
Figure 3

Most Cited Studies

As illustrated in Figure 3, the most highly cited publication is by Burchinal M. (2010) in Early Childhood Research Quarterly (462 citations). The study by Margaryan A. (2015) in Computers & Education ranks second with 459 citations. Other notable highly cited works include Praetorius A.K. (2018, 301 citations), Huber S.G. (2020, 226 citations), Kersting N.B. (2012, 215 citations), and Aldrup K. (2018, 214 citations). These findings suggest that certain studies have significantly shaped the literature on educational excellence and have therefore been widely cited. High citation counts also indicate that these works play crucial roles in forming theoretical frameworks, providing policy recommendations, and guiding future research.

e) **Three-Field Bibliometric Map**

Figure 4 visualizes the relationships among title terms, authors' countries, and keywords in publications on educational excellence between 2010 and 2024.

Figure 4

Three-Field Plot: Title Terms, Authors' Countries, and Keywords

An analysis of Figure 4 shows that the most frequently used title terms include "quality," "education," "teaching," "academic," "learning," "students," and "university." This indicates that educational excellence is closely associated with instructional quality, academic achievement, and learning processes. In terms of author countries, Germany, the United States, and the United Kingdom are the leading contributors. This dominance may be attributed to these countries' strong research focus on global education policies and higher education systems. Keyword analysis reveals frequent use of terms such as "instructional quality," "higher education," "teaching excellence," "teacher education," and "professional development."

Notably, Turkey's contributions are largely concentrated on teacher education and professional development but remain relatively limited in terms of international collaborations, indicating the need to enhance global engagement and promote English-language publications.

f) **Most Frequently Used Keywords**

The most frequently used keywords in educational excellence publications between 2010 and 2024 are displayed as a word cloud in Figure 5.
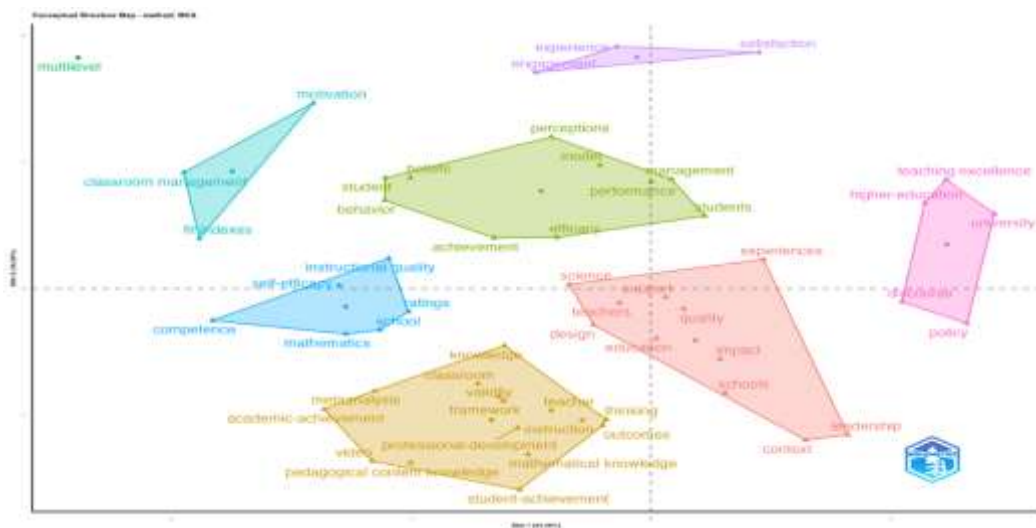
Figure 5

Word Cloud of Keywords

The word cloud reveals that "instructional quality" dominates the literature, clearly representing the central focus of these studies. Other frequently recurring keywords include "education," "achievement," "classroom," "knowledge," "teachers," and "students." Additional keywords such as "classroom management," "self-efficacy," "mathematics," "perceptions," "professional development," "pedagogical content knowledge," "performance," and "higher education" further indicate that research on educational excellence extends beyond instructional quality to encompass diverse variables such as teacher competencies, student perceptions, and classroom management.

g) Factor Analysis of Keywords

To explore the conceptual structures of the keywords identified through bibliometric analysis, a Multiple Correspondence Analysis (MCA) was conducted. The resulting clusters are shown in Figure 6.

Figure 6

Conceptual Map of Keywords (MCA)

The analysis identified seven key conceptual clusters:

- *Green Cluster (Student Behavior & Achievement):* Includes terms such as student, behavior, beliefs, performance, model, management, and efficacy, reflecting concepts related to students' beliefs, behaviors, and classroom management.

- *Blue Cluster (Mathematical Achievement & Instructional Quality):* Contains terms like mathematics, competence, self-efficacy, instructional quality, and school, emphasizing themes related to mathematics education and student self-efficacy.

- *Red Cluster (Teachers & Educational Context):* Includes education, teachers, support, impact, context, leadership, and quality, highlighting teacher support, leadership, and quality in education.

- *Pink Cluster (Higher Education & Policy):* Encompasses higher education, university, discourse, policy, and teaching excellence, addressing university-level instructional quality and policy issues.

- *Orange Cluster (Pedagogical Content & Professional Development*): Includes student achievement, framework, validity, instruction, and professional development, focusing on teacher education and pedagogical content knowledge.

- *Purple Cluster (Student Satisfaction & Engagement):* Contains satisfaction, experience, and engagement, addressing student participation, experiences, and satisfaction.

- *Dark Green Cluster (Classroom Management & Motivation):* Composed of fit indexes, motivation, and classroom management, emphasizing themes of classroom management and student motivation.
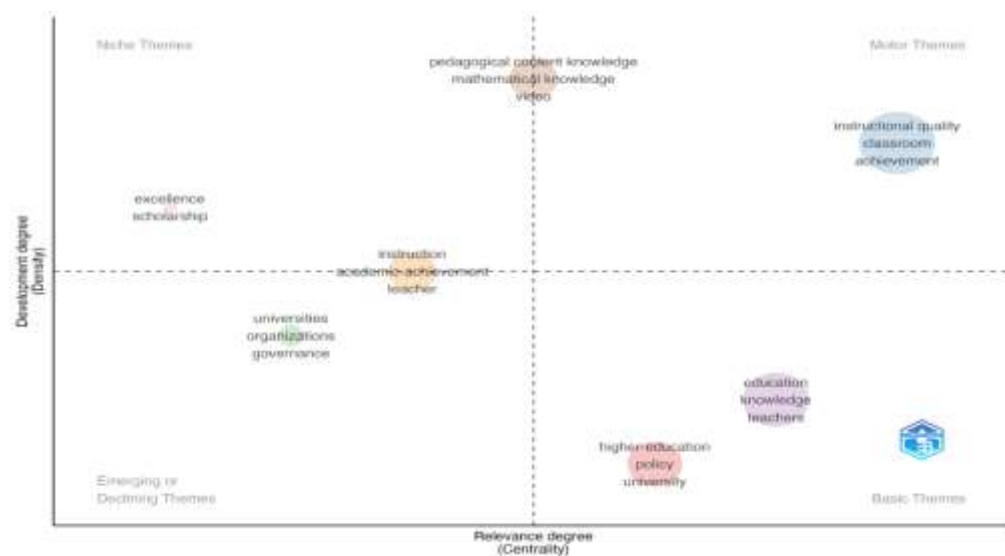
These findings demonstrate that the research areas related to educational excellence are multifaceted, covering themes from student behavior and achievement to higher education policies and teacher development.

h) Thematic Map: Motor, Niche, Basic, and Emerging Themes

The thematic map derived from the bibliometric analysis is shown in Figure 7.

Figure 7

Thematic Map

The map classifies themes based on centrality and density into four quadrants (Aras, 2023):

- The upper-right quadrant (Motor Themes) represents well-developed and central topics, with "instructional quality," "classroom," and "achievement" emerging as key themes.

- The upper-left quadrant (Niche Themes) includes specialized but less central topics such as "pedagogical content knowledge," "mathematical knowledge," and "video."

- The lower-right quadrant (Basic Themes) contains foundational but less developed themes such as "higher education," "policy," and "university."

- The lower-left quadrant (Emerging or Declining Themes) includes underdeveloped or marginal topics such as "universities," "organizations," and "governance."

Overall, the thematic map effectively illustrates the foundational, emerging, and specialized research directions in the field of educational excellence.

Discussion, Conclusion, and Recommendations

The findings of this study reveal that the number of publications on educational excellence increased from 25 in 2010 to 110 in 2023. This growth demonstrates that the concepts of quality and excellence in education have gained increasing significance in both academic literature and policy-making processes. Particularly, the centralization of goals such as improving instructional quality and enhancing student achievement within the field of educational sciences provides meaningful context for this expansion (Kayadibi, 2001). The trend indicates that education systems are not only focusing on academic outcomes but are also emphasizing the quality and sustainability of the learning process. In this regard, the rise in the number of publications reflects the active engagement of the academic community in the field—not only through theoretical contributions but also through practice-oriented recommendations.

The study identified Charalambous C.Y. as the most prolific author, with 18 publications, highlighting this scholar's central role in shaping knowledge production in the field. The contributions of other prolific authors, such as Neuhaus B.J. and Praetorius A.K., demonstrate that research on educational excellence is approached from a multidimensional perspective. Their productivity suggests that the topic is being studied through diverse disciplinary lenses rather than a single viewpoint. One of the most highly cited studies, Burchinal (2010), which focused on instructional quality in early childhood education, has provided a strong foundation for theoretical and practical discussions in the field. Such works reinforce the understanding that instructional processes should contribute not only to cognitive outcomes but also to the social and emotional development of students. Similarly, Margaryan's (2015) highly cited study on the integration of digital tools and technology illustrates how contemporary educational approaches have been embedded within the concept of educational excellence. This highlights the role of technological advancements as an essential factor supporting quality and accessibility in education.

One of the strengths of this study lies in its conceptual mapping of keywords based on factor analysis. The emergence of clusters such as "student behavior and achievement," "mathematical achievement and instructional quality," and "teacher support and educational context" underscores that educational excellence is not merely a performance indicator but a multidimensional construct shaped by the quality of instructional environments, teacher competencies, and student experiences. The inclusion of themes such as "student satisfaction and engagement" and "motivation and classroom management" further emphasizes the importance of a student-centered approach in determining educational quality. These findings make it clear that educational excellence cannot be reduced to academic performance alone; psychosocial factors are also integral components of the process. Consequently, the results suggest that redesigning instructional processes should account for student motivation, classroom dynamics, and teacher-student relationships as critical factors.

The thematic map analysis identified "instructional quality," "classroom," and "achievement" as motor themes, representing well-developed and central areas of research. This underscores that improving instructional quality and refining classroom practices remain at the core of the pursuit of

educational excellence. Conversely, niche themes such as "pedagogical content knowledge" represent highly specialized areas of research that require deeper expertise but have weaker central connections to the broader field. Basic themes like "higher education" and "policy" highlight the importance of systemic considerations, institutional strategies, and policies in shaping the field. In contrast, emerging or declining themes such as "universities" and "governance" suggest areas that are either underexplored or deprioritized, offering opportunities for future investigation.

Another noteworthy finding of this study is the role of international collaborations in advancing research on educational excellence. Countries such as Germany, the United States, and the United Kingdom have made significant contributions, reflecting their strong research cultures and institutional focus on global education policies and higher education. Meanwhile, Turkey's contributions are predominantly concentrated in teacher education and professional development. This indicates that increasing Turkey's visibility in international publications and expanding global collaborations could provide substantial momentum for the field. In particular, expanding the number of English-language publications would allow Turkey-based research to reach a broader audience and achieve greater impact.

This study has certain limitations. First, it exclusively analyzed English and Turkish-language articles indexed in the Web of Science database, thereby excluding research published in other languages or indexed in alternative databases (e.g., Scopus, ERIC). Additionally, the inclusion of only journal articles excludes potentially valuable contributions from book chapters and conference proceedings. Future research should address these gaps by incorporating diverse databases and expanding the scope of publication types. Furthermore, conducting comparative studies on conceptualizations of educational excellence across different cultural and geographical contexts would provide a more comprehensive understanding of global trends. Detailed analyses of international collaborations and the use of mixed-methods approaches (e.g., content analysis, interviews) could also strengthen the field by providing richer insights and more actionable recommendations for policymakers.

Overall, this study provides a comprehensive overview of the evolution and multidimensional nature of the concept of educational excellence. The findings highlight that instructional quality, student achievement, and institutional quality assurance are interrelated and should be considered as complementary components. Additionally, the factor analyses and thematic map interpretations offer a strategic roadmap for future research. In particular, student-centered approaches, teacher competencies, and classroom management emerge as priority areas for further investigation. In this regard, the study serves as a valuable guide for policymakers, educational leaders, and scholars aiming to enhance the quality and sustainability of educational practices.

Disclosure Statements

Contribution rate statement of the researchers:

Both authors contributed equally to this study.

Conflict of interest statement:

The authors declare that there is no conflict of interest.

CRediT Authorship Contribution Statement

Dilay TIĞLI, Mehmet Taha ESER: Conceptualization, methodology, data collection, data analysis, writing – review & editing.

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Ethical Declaration and Committee Approval

In this research, the principles of scientific research and publication ethics were followed.