Okul etkililiği araştırmalarına yönelik bibliyometrik bir analiz

A bibliometric analysis of school effectiveness research

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ÖZ

Okul etkililiği araştırmaları yarım asırdan fazla bir süredir araştırmacılardan dikkate değer bir ilgi görmektedir. Söz konusu ilginin bir ürünü olarak da alanyazında oldukça zengin bir bilgi birikimi ortaya çıkmıştır. Bununla birlikte, detaylı bir alanyazın taraması neticesinde bu bilgi birikimini bibliyometrik bir yöntemle ortaya koyan bir çalışmaya rastlanmamıştır. Alanyazındaki mevut boşluğu doldurmak amacıyla mevcut araştırma 1981-2021 yılları arasında Web of Science Core Collection veri tabanında indekslenen dergilerde okul etkililiği konusunda yayımlanan makaleleri çeşitli bibliyometrik göstergeler açısından incelemektedir. Veri tabanında tarama "school* effectiv*", "effectiv* school*", "effectiv* of school*", "effectiv* in school*" terimleri ile aralarında "or" kullanılarak yürütülmüştür. Analize sadece İngilizce dilinde yayımlanan makaleler dahil edilmiştir. İlk tarama neticesinde 3089 çalışmaya ulaşılmış ancak araştırmanın ölçütleri ile örtüşmeyen çalışmalar hariç tutulduğunda analiz 1102 çalışma üzerinde yürütülmüştür. Bu bağlamda, araştırma bulguları araştırmaların genel görünümünü, 40 yılı aşkın bir süreçte yıllar içerisinde makalelerin yıllık frekans dağılımını, makale sayısı bağlamında en üretken araştırmacıları, dergileri, ülkeleri, toplam atıf sayısı bağlamında en etkili makaleleri, en sık tekrar eden yazar anahtar kelimelerini, anahtar kelimelerin birlikte görünürlüğünü, ortak yazarlık ağlarını ve ülkeler arası iş birliğini ortaya koymaktadır. Elde edilen bulguların okul etkililiği konusunda yürütülen araştırmaları ilgili göstergeler bağlamında yapılandırarak araştırmacıların konuya yönelik daha derin ve ayrıntılı bir bakış açısı geliştirmelerine yardımcı olacağı öngörülmektedir. Ayrıca, elde edilen bulgular temelinde gelecekte yürütülecek araştırmalara yönelik bazı öneriler getirilmiştir.

Anahtar Sözcükler: okul, etkililik, bibliyometrik

ABSTRACT

School effectiveness research has received considerable attention for over half a century, resulting in abundant literature. However, there is a gap in the literature in terms of presenting this knowledge base through a bibliometric analysis. To fill this gap, the current study examines the articles on school effectiveness published in journals indexed in the Web of Science Core Collection (WoS) database between 1981 and 2021. The search was conducted using the terms "school* effectiv*", "effectiv* school*", "effectiv* of school*", "effectiv* in school*" and "or" between them. Only articles published in the English language were included in the analysis. The initial search yielded a total of 3089 articles, but when the studies that did not satisfy the study's inclusion criteria were excluded, a total of 1102 studies remained. The research findings include the general profile of the articles, the annual frequency distribution of the articles by year, the most productive researchers, journals, and countries by the number of articles, the most influential articles in terms of the number of citations, the most frequently occurring author keywords, and their co-occurrence pattern. The findings also reveal co-authorship and cross-country collaboration patterns. The findings are anticipated to provide substantial implications for researchers to develop a deeper and more detailed insight into school effectiveness as a research field by structuring the existing literature. Additionally, some suggestions were made based on the findings.

Keywords: school, effectiveness, bibliometrics

INTRODUCTION

School effectiveness is a term used to describe educational research investigating the differences within and between schools. It primarily aims to provide information about the relationships between "explanatory" and "output" elements using appropriate models. It examines the average differences between schools by considering an outcome such as exam scores. Researchers are interested in the differences between schools and how factors such as students' social backgrounds or the curriculum arrangement are influential (Goldstein, 1997). School effectiveness research focusing on what and why works in education (Creemers & Reezigt, 2005) has largely emerged from the backlash of studies on equality of opportunity in education by Coleman et al. (1966) and Jencks et al. (1972) in the United States of America. These studies made inferences that the role of the school in students' achievement is not significant and suggested that a very small part of the variance in student achievement, especially considering factors such as family and talent, was related to school-related factors (Creemers et al., 2010). However, it has become globally accepted that schools affect student development, that some observable practices create added value, and that education policies must develop schools in general and less effective schools in particular (Reynolds et al., 2003), which brought about school effectiveness research. The most distinctive feature of effective school research is that it attempts to open the "black box" of schools by investigating the characteristics of schools in terms of organization and content (Scheerens et al., 2005). School effectiveness research aims to propose a conceptual framework, define the variables that are expected to affect education at the school and classroom level, present implications for how education policies can enhance school effectiveness, review existing studies in terms of the association between success in education and factors affecting success, present those who can contribute to school effectiveness in practice by examining theoretical models, and make suggestions on how education planners can benefit from the knowledge revealed by effective school research in practice (Scheerens, 2000).

There was a drastic increase in school effectiveness research in the 1980s, and they became very influential in that many countries sought to design their education systems based on their findings (Townsend, 2019). Studies conducted by Edmonds (1979) and Rutter et al. (1979) are considered the beginning of effective school research (Luyten et al., 2005). However, the "First International Congress of School Effectiveness and Improvement," which was held in London in January 1988, and the "School Effectiveness and School Improvement Journal," which published its 1st volume in 1990, played a substantial role in the growing interest in school effectiveness research (Coe & Fitz- Gibbons, 1988). School effectiveness research focused on the "most" and "least" contributors to effectiveness (Scheerens, 2000) and passed through four phases in the United States, where it originated (Reynold et al., 2003). These phases can be briefly explained as follows: The first phase covers the period from the 1960s to the early 1970s and is characterized by the input-output paradigm focusing on the impact of the school's human and material resources on outputs. The second phase covers the period from the early to the late 1970s, when "effective school research" emerged. It is also the phase during which a series of in-school processes and outcomes are examined in more detail. The third phase is the period from the late 1970s to the mid-1980s. There were efforts to include effective school-related factors in research through various school improvement programs. The fourth and final phase can be expressed as a period in which more complicated methods and contextual factors were included in the research. On the other hand, Burušić et al. (2016) summarized the evolution in school effectiveness research as of the 1980s. The researchers suggested that the 1980s could be characterized by attempts to prove the influence of schools and teachers on student achievement; the 1990s by the attempts to reveal the variables related to school effectiveness and the characteristics of effective schools. The 2000s is the period in which effective school models were developed that include factors at the level of students, teachers, classes, and schools. More recently, research has focused on exploring the dynamic nature of school effectiveness.

School Effectiveness

In the most general terms, school effectiveness refers to the level of attainment of goals. While the most common criteria for the effectiveness of schools is average achievement scores at the end of a particular program, criteria such as being able to respond to the needs of society and teachers' satisfaction can also be considered (Scheerens, 2015). There are various definitions of school effectiveness in literature. It can be defined as the impact of school-level factors such as the school's teaching policy, school climate, and school mission on students' cognitive and affective performance (Creemers et al., 2010) or the school's capacity to be effective with different student groups (Kyriakides, 2004). On the other hand, Slater and Teddlie (1992) defined effective schools as those where student achievement is above the level that can be predicted by only examining the parents' socioeconomic characteristics. Cheng (1996) pointed out the functions of schools and defined school effectiveness as the capacity of the school to maximize its functions or the degree to which the school performs its functions when a certain input is provided. Accordingly, Cheng suggested six school functions: technological, economic, social, political, cultural, and learning. These functions can also be considered in terms of school effectiveness.

On the other hand, the five-factor theory of effective schools dominated the literature for a long time. The model suggested that effective schools can be characterized by strong educational leadership, a focus on the acquisition of basic skills, an orderly and safe school environment, high expectations from students, and frequent assessment of student progress (Creemers, 1994; Reynolds et al., 2004; Scheerens & Creemers, 1989; Scheerens et al., 2005). Until the 1990s, these factors guided school effectiveness research, but later, the view that the effectiveness of schools should be evaluated based on contextual factors prevailed in the literature (Townsend, 2007). Accordingly, Acker-Hocevar et al. (2012) suggested that the effectiveness of schools was associated with the processes within the school, and it was the school's ability to determine factors that would work best, leading to effectiveness. Therefore, it can be said that the factor that leads to effectiveness in one school might not work for another, rather than a generalizable formula for all schools.

In the literature, various characteristics of effective schools are listed. These are effective leadership and instruction, improving and developing teaching focus, creating a positive school culture, setting high and appropriate expectations, emphasizing students' rights and responsibilities, monitoring student progress, improving employee skills, enhancing productive and appropriate parent involvement, learning organization, shared vision and goals, decentralization, instructional leadership, low employee rotation, learning organization, a planned and purposeful curriculum, support from the district (Edmonds, 1979; Purkey & Smith, 1983; Reynolds & Teddlie, 2003; Sammon et al., 1995).

It is difficult to evaluate the schools' effectiveness without employing a model to define, interpret and determine the effectiveness criteria. Thus, the literature provides various models of school effectiveness (Balcı, 2014). Cheng (1997) described these models as the goal model, focusing on the achievement of goals; the resource-input model focusing on needed resources and inputs; the process model focusing on healthy and smooth organizational processes; the satisfaction model focusing on the satisfaction of all stakeholders; the legitimacy model focusing on successful, legitimate marketing activities that must be carried out for the school to survive; the ineffectiveness model focusing on the absence of indicators of ineffectiveness in school; organizational learning model focusing on adaptation to organizational barriers and changing environmental conditions and total quality management focusing on the total management of the school's internal stakeholders and processes to satisfy the strategic needs of the stakeholders.

School effectiveness research has more than 50 years of history, and abundant literature has accumulated. When the keyword "school effectiveness" is searched on the internet, it yields about 5 million results in half a second on Google Scholar and over 75,000 on Education Research Center (ERIC). Such a great body of literature may cause some challenges for researchers to develop a general perspective on and a deeper insight into the issue (Cretu & Morandau, 2022). To present

the knowledge on school effectiveness in a systematic and organized manner, there are various attempts in the literature, such as systematic review (Polatcan & Cansoy, 2018), literature review (Gilleece & Clerkin, 2020; Luyten et al., 2005; Reynolds et al., 1994; Wang et al., 1993) and meta-analysis (Mitchell, 2015; Scheerens, 2016; Scheerens et al., 2013). However, a rigorous literature review demonstrated no bibliometric analysis of school effectiveness research. The bibliometric analysis provides researchers with opportunities to evaluate the progress that should be made in any field, identify the most reliable scientific publications and leading scholars in the field, establish a theoretical basis for evaluating new developments, and develop bibliometric indicators that can be used to evaluate academic outputs (Gutierrez-Salcedo et al., 2018). According to Holden et al. (2012), analyzing large data sets through a bibliography facilitates the investigation of the sociology of science, trends in various subject areas, as well as between individuals or journals, and decision-making processes regarding individuals, institutions, or organizational issues. To exploit these advantages, the researchers showed a growing interest in bibliometric analysis in educational sciences as well as in other disciplines (Bozdoğan, 2020; Dilekçi & Manap, 2022; Gong et al., 2019; Gülmez et al., 2021; Xie et al., 2016; Zang et al., 2020). However, a large body of research on school effectiveness lacks a bibliometric study. This study aimed to fill this gap in the literature by employing bibliometric analysis and sought answers to the following questions:

Research Questions

1. What is the frequency distribution of articles on school effectiveness over the years?
2. Who are the most productive scholars by the number of articles published in WoS?
3. What are the most productive journals by the number of articles published in WoS?
4. Which countries are the most productive by the number of articles published in WoS?
5. What are the most frequently cited articles by the total number of citations?
6. What are the most recurring author keywords in school effectiveness research?
7. What is the co-occurrence pattern of author keywords?
8. What is the co-authorship pattern of school effectiveness research?
9. What is the collaboration pattern between the countries?

METHOD

Search Strategy

The data were retrieved from the Web of Science (WoS) database. This database was preferred because it enabled refining the search on education and educational research. Additionally, Wang and Waltman (2016) revealed that the WoS journal classification system had a higher accuracy than the Scopus database. The scanning process was carried out on May 5, 2022.

The search was carried out in the "topic" area, which includes the title, abstract, author keywords, and keyword plus. The search was carried out using the terms "school* effectiv*", "effectiv* school*", "effectiv* of school*", "effectiv* in school*". Using these terms and "OR" between them, the researcher aimed to reach all possible concept variants. The first search yielded 3089 results. Firstly, "Review" and "Early Access" articles were excluded, and 2780 articles remained. Secondly, the publications in 2022 were also excluded, and 2759 articles remained. Thirdly, excluding non-journal articles yielded 2150, and refining the Education and Educational Research category yielded 1251 articles. When the language of the articles was refined to English, there was a total of 1112 articles to analyze. Lastly, the researcher checked the data set; ten articles published in 2022 were identified and excluded, resulting in 1102 articles to be analyzed.

Data Analysis

Data analysis was carried out employing the Biblioshiny plugin of RStudio. The data analysis followed the five-step process suggested by Zupic and Cater (2015). These stages are (1) deciding

on the research design (research question and choosing the appropriate bibliometric method for the research question), (2) compiling the bibliometric data (selecting the database, filtering, and downloading), (3) visualization, (4) analysis (selecting the appropriate software and cleaning the data), and (5) interpreting the findings (identification and interpretation of findings).

The basic procedures of performance analysis and science mapping were employed in data analysis (Noyons et al., 1999). Performance analysis evaluates individuals' and institutions' publications and research performance, while science mapping aims to reveal the structure and dynamics of scientific fields and disciplines (Zupic & Cater, 2015). Within the scope of performance analysis, the frequency distribution of "school effectiveness" research by years, the most productive authors, journals, and countries by the number of articles, the most frequently occurring author keywords, and the most influential articles by the number of citations were presented. On the other hand, within the scope of science mapping, the co-occurrence of author keywords, co-authorship, and cross-country collaboration patterns were revealed.

Research Ethics

All the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed in the entire process from the planning, implementation, data collection to the analysis of the data. None of the actions specified under the second section of the Directive, "Scientific Research and Publication Ethics Actions" have been carried out.

During the writing process of this study, scientific, ethical, and citation rules were followed; no falsification was made on the collected data, and this study was not sent to any other academic media for evaluation.

Research ethics committee approval information

Since this study retrieved the data from an open-access database and it is not included in the group of studies that require Ethics Committee Permission. Therefore, Ethics Committee Permission was not declared.

FINDINGS

Table 1 below presents the main information about the data. Accordingly, the study investigated 1102 journal articles published in 233 sources between 1981-2021. As the table shows, the average number of citations per article is 22.03, and the average number of citations per year per article is 1.62. There are 1845 author keywords. The number of authors in single-authored articles is 329, and 1579 in multi-authored articles. The number of single-authored articles is 399, and the number of articles per author is 0.58. Authors per article are 1.73, and co-authors per article are 2.2. Lastly, the collaboration index is 2.25.

Table 1
Main Information about the Articles

Description	Results
Timespan	1981-2021
Sources	233
Documents	1102
Average citations per document	22.03
Average citations per year per document	1.62
Author's Keywords (DE)	1845
Authors of single-authored documents	329
Authors of multi-authored documents	1579
Single-authored documents	399
Documents per author	0.58
Authors per document	1.73
Co-authors per document	2.2
Collaboration index	2.25

Graphic 1 depicts the frequency distribution of articles by year. The number of publications between 1981-2021 is 1102. The timespan covers nearly 40 years. The number of articles published between 1981-1990 is 78, accounting for approximately 7% of the total production. 1985 was the most productive year, with 20 articles within this timespan. On the other hand, between 1991 and 2000, 165 articles were published, accounting for 15% of the total. As for 2001-2010, 284 articles were published, accounting for 26% of the total. Lastly, between 2011-2020 the number of articles published was 520, accounting for 47% of the total production. In this context, 2011-2020 is the most productive period in school effectiveness research. Additionally, 55 articles were published in 2021, indicating a growing research volume. The findings suggested a regular increase in the number of school effectiveness research over the years.

Graphic 1
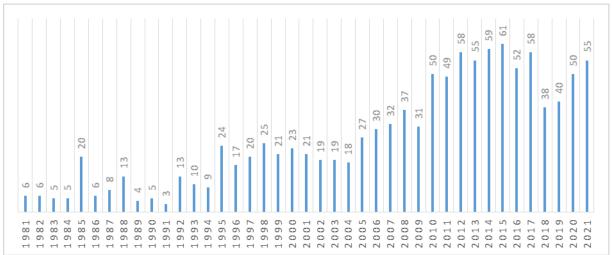*Frequency Distribution of Articles by Year*

Table 2 shows the ten most productive authors and the findings suggested that only six authors (0.31%) published ten or more; 31 authors (1.63%) 5 to 9; 57 authors (3%) 3 to 4 articles. Most of the authors (%95) published one or two articles on school effectiveness. As shown in the table, L. Kyriakides is the most productive author with 24 articles; B.P.M Creemers is the second most productive author with 18 articles, and P. Hallinger is the third with 17 articles. As for the number

of citations, the three most productive authors also have the most citations. However, P. Hallinger is the most influential author by the number of citations (n=2060).

Table 2
The Ten Most Productive Authors by the Number of Articles

Author	Articles (f)	Citations (f)
Kyriakides, L.	24	893
Creemers, B.P.M.	18	696
Hallinger, P.	17	2060
Teddlie, C.	11	369
Scheerens, J.	10	261
Van Damme, J.	10	461
Reynolds, D.	9	407
Gorard, S.	8	209
Levine, D.U.	8	52
Murphy, J.	8	233

As Table 3 shows, the articles in the data set were published in 233 different journals. The number of journals that published ten or more articles on school effectiveness is 29. Table 5 presents the most productive ten journals by the number of articles published. These journals published 389 articles in total and accounted for 35.23% of the total publications, implying that a considerable amount of school effectiveness research was published in the journals listed in the table. On the other hand, School Effectiveness and School Improvement is a leading journal with 137 articles (12.43%) and the most cited journal with 4601 citations. Educational Administration Quarterly follows it with 43 articles (3.90%) and 2756 citations. The third most productive journal is School Leadership & Management, with 38 articles (3.45%) and 587 citations. The number of publications in the first three sources is 218, accounting for nearly %20 of the total. Based on these findings, it can be said that School Effectiveness and School Improvement, Educational Administration Quarterly, and School Leadership & Management are the most influential journals on school effectiveness research.

Table 3
The Ten Most Productive Sources by the Number of Articles

Source	Articles (f)	Citations (f)
School Effectiveness and School Improvement	137	4601
Educational Administration Quarterly	43	2756
School Leadership & Management	38	587
Journal of Educational Administration	31	512
Educational Management Administration & Leadership	29	448
Journal of School Health	28	558
Urban Education	22	191
British Educational Research Journal	21	722
Oxford Review of Education	21	561
PHI Delta Kappa	19	204

Table 4 presents the top 10 most productive countries by the number of articles. The findings suggest that the United States is the first, with 137 articles accounting for 56.71% of the total production, implying that an American scholar authored or co-authored more than half of the publications. The UK ranks second with 245 articles (22.23%), and Australia with 115 articles (10.43%). Other leading countries are the Netherlands (n=112; 10.1%), China (n=69; 6.26%),

Canada (n=52; 4.72%), South Africa (n=50; 4.54%), Israel (n=45; 4.10%), Belgium (n=39; 3.54%) and Southern Cyprus (n=38; 3.45%).

Table 4
The Ten Most Productive Countries by the Number of Articles

Country	Articles (f)	%
The United States of America	625	56,71
United Kingdom	245	22,23
Australia	115	10,43
The Netherlands	112	10,16
China	69	6,26
Canada	52	4,72
South Africa	50	4,54
Israel	45	4,10
Belgium	39	3,54
Southern Cyprus	38	3,45

Table 5 presents the top 10 most cited articles on school effectiveness. The findings indicate that the most cited article is by Pfeffer & Fong (2002) and has 973 citations. The second most-cited article is by Hallinger & Heck (1998), with 512 citations, and the third most-cited article is by Hallinger & Heck (1996), with 481 citations. The table shows that the ten most cited articles were published in eight journals. Three of the most cited articles appeared in the Educational Administration Quarterly, and each of the other articles was in different journals. P. Hallinger is the author or co-author of the three most cited articles. The articles were published between 1996 and 2008. Considering the timespan of articles analyzed, the ten most cited articles were published in the second and third decades of the period.

Table 5
The Most Cited Ten Articles

Title	Author(s)	Journal	Citations (f)
The end of business...	(Pfeffer & Fong, 2002)	Academy of Management Learning and...	973
Exploring the principal's...	(Hallinger & Heck, 1998)	School Effectiveness and School Improvement	512
Reassessing the principal's...	(Hallinger& Heck,1996)	Educational Administration Quarterly	481
Resources, instruction, and...	(Cohen et al.2003)	Educational Evaluation and Policy Analysis	370
Instructional leadership and...	(Hallinger, 2005)	Leadership and Policy in Schools	301
Dropping out of high school...	(Lee & Burkam,2003)	American Educational Research Journal	281
How teachers experience...	Wahlstrom & Louis, 2008)	Educational Administration Quarterly	255
Reform, standards, and...	(Day et al.2005)	Teaching and Teacher Education	222
Linking leadership to...	(Leithwood & Jantzi, 2008)	Educational Administration Quarterly	222
The distribution of dropout...	(Rumberger & Thomas, 2000)	Sociology of Education	209

Figure 1 below depicts the most frequently occurring author keywords in school effectiveness research. The findings suggest that 1845 different terms were used as author keywords. The term "school effectiveness (f=187)" is the most frequently occurring author keyword which is followed by "school improvement (f=75)". "Leadership (f=47)", "school leadership (f=27)", and "principals (f=24)" are other frequently occurring author keywords. Other frequent author keywords are "schools (f=23)", "educational policy (f=22)", "professional development (f=21)", "student

achievement f=21)", "accountability (f=20)", "effectiveness (f=20)", "management (f=19)", "school climate (f=16)", "effective schools (f=15)", "educational change (f=14)", "educational effectiveness (f=14)", "instructional leadership (f=14)", "school reform (f=14)", "teacher effectiveness (f=14)" and "teachers (f=14)", respectively.

Figure 1
The Most Frequently Occurring Author Keywords

Figure 2 illustrates the co-occurrence of author keywords. As a criterion, a minimum of 2 co-occurrences of the keywords was considered, and analysis was carried out on 46 keywords. The analysis yielded six clusters. In the first cluster, the red one, there were 20 keywords which were "school effectiveness, school improvement, educational policy, accountability, school climate, educational effectiveness, school reform, teacher effectiveness, academic achievement, urban education, multilevel analysis, school effects, education policy, primary school, school culture, secondary schools, educational effectiveness research, educational reform, poverty, school self-evaluation". In the second cluster, the green one, there were 14 keywords which were "school leadership, principals, schools, student achievement, instructional leadership, teachers, school management, educational leadership, school principals, trust, principal, educational administration, principal leadership, secondary education". In the third cluster, the orange one, there were four keywords which were "evaluation, assessment, effectiveness, education". The fourth cluster, the blue cluster, contains the keywords "leadership, effective schools, management, educational change". The fifth cluster, the purple one, consists of the keywords "professional development, distributed leadership" and, the sixth cluster, the brown cluster, consists of the keywords "teacher education, learning".

Figure 2

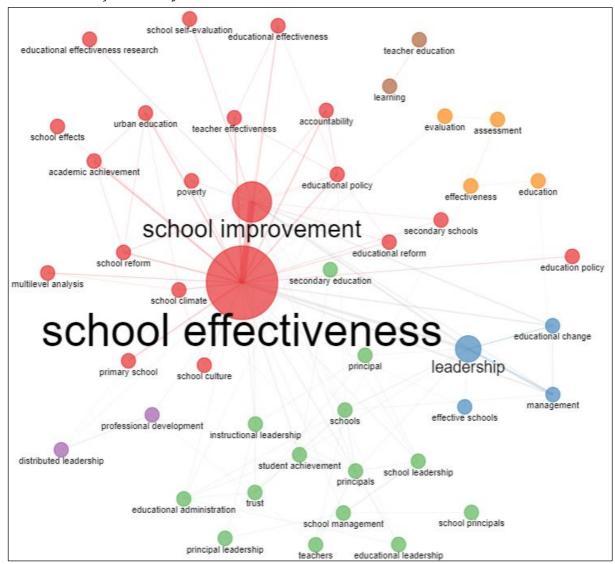*Co-occurrence of Author Keywords*

Figure 3 illustrates the network of co-authorship. As the figure shows, seven clusters emerged. Of these clusters, red, purple, and green are connected, and four (orange, brown, pink, and blue) are isolated. There are 14 authors in the red, purple, and green clusters. In the center of the red cluster are L. Kyriakides, J.V. Damme in the purple cluster, and S. Stringfield in the green cluster. Orange, brown, pink, and blue clusters, which are isolated, do not have a central knot.
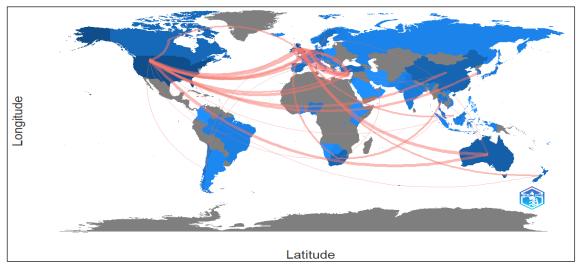
Figure 3
Network of Co-authorship

Figure 4 below illustrates the collaboration network between countries. As the figure shows, the United States of America, the United Kingdom, Southern Cyprus, and the Netherlands are the leading countries collaborating with other countries. The findings suggest 130 matches between countries and a total of 268 collaborations in these matches. The most frequently collaborating countries are the Netherlands and Southern Cyprus (f=16), the United States of America and the United Kingdom (f=11), the United Kingdom and Southern Cyprus (f=9), and the United Kingdom and the Netherlands (f=9).

Figure 4
The Collaboration Network between Countries

DISCUSSION and CONCLUSION

The current study reveals the bibliometric profile of research on school effectiveness published between 1981 and 2021 and indexed in the Web of Science database. The bibliometric indicators in the study are the frequency distribution of the articles over the years, the most productive researchers, journals, and countries by the number of articles, the most influential articles by the number of citations, the most frequently occurring author keywords, the co-occurrences of the keywords, network of co-authorship and cross-country collaborations.

The first research question dealt with the frequency distribution of school effectiveness research over the years. The findings indicate that there has been a regular increase in the volume of research for the last forty years with a drastic increase since the mid-1990s. However, the most striking increase occurred between 2010-2020, when more than half of the articles were published. Reynolds (2010) suggested that school effectiveness did not attract much attention as a research field and was not influential on educational sciences because it was not investigated in a multifaceted manner until the mid-1990s. As of the mid-1990s, school effectiveness research recorded significant intellectual and practical progress. On the other hand, International Congress for School Effectiveness and Improvement was held for the 20th time in January 2007. Every year, the congress sought ways to make schools more effective by bringing together leading researchers, practitioners, and policymakers in the field of educational sciences in various parts of the world (Townsend, 2007). Additionally, affiliated with the congress, a journal specific to school effectiveness and improvement began to be published in 1988 (Coe & Fitz-Gibbon, 1988). It can be stated that these two factors have an important role in the increase in school effectiveness research during this period.

The second research question addressed the most productive authors on school effectiveness by the number of articles. Leonidas Kyriakides, Bert P.M. Creemers, and Philip Hallinger stand out as the top three most productive scholars. Additionally, they rank in the top three by the number of citations, implying that their research is also influential.

The third research question investigated the most productive journals by the number of articles published. The determining parameters of scientific journals provide information on the development/effect of any discipline or field individually and the journal's impact on the academic environment. Academic journals publicly record scientific findings; and make the contribution, prestige, and recognition of authors, institutions, editors, countries, and disciplines visible, functions as mediating the dissemination of information (Ball, 2018). The findings show that the School Effectiveness and School Improvement Journal is the most productive source since it was specifically established to publish research on school effectiveness and improvement. It is followed by Educational Administration Quarterly and School Leadership & Management. The number of articles published in these three journals corresponds to approximately 20% of the total number of publications. In this context, it can be stated that these three journals contributed most to school effectiveness and its recognition as a research field.

The fourth research question addressed the most productive countries. The findings reveal that the United States of America, the United Kingdom, Australia, and the Netherlands are the most productive countries. Researchers from the United States of America contributed to more than half of the articles reviewed. School effectiveness studies emerged primarily in the United States of America and the United Kingdom (Creemers, 1996; Teddlie & Stringfield, 2007); then spread to the Netherlands and Australia and developed very rapidly in these two countries (Creemers, 1996; Reynolds et al., 2003) which shows that the spread of field was parallel to the productivity. On the other hand, the fact that the journal of School Effectiveness and School Improvement, which is the most productive source, is of UK origin can be considered a factor in this finding. The Congress for School Effectiveness and Improvement was held twice (Melbourne, 1994 and Sydney, 2003) in Australia, and key stakeholders in education, such as policymakers, practitioners, and researchers, actively participated in the congress (Caldwell, 2007). In addition to this, school effectiveness research in Australia, especially since the early 1990s, arose from the

need to justify some ongoing change efforts in the education system by governments (commonwealth and state governments), and large-scale research projects on school effectiveness were conducted with the commission and support of governments (Townsend, 1996). These might have contributed to the development of school effectiveness research in Australia. As for the Netherlands, school effectiveness research started with the replication of studies conducted in the United States to confirm similar results or provide empirical evidence for the five-factor model and gained momentum since the 1990s (Scheerens & Creemers, 1996). Similarly, in a bibliometric analysis of leadership research in higher education, it was determined that the United States, the United Kingdom, and the Netherlands were among the most productive countries (Esen et al., 2018).

Within the fifth research question, the study investigated the most influential articles by the number of citations. Findings suggest that "The end of business schools? Less success than meets the eye" (Pfeffer & Fong, 2002) is the most cited article. This study examined the effectiveness of business schools in terms of career success and revealed that the schools did not significantly affect graduates' career success (Pfeffer & Fong, 2002). The second most cited article is "Exploring the principal's contribution to school effectiveness: 1980-1995" by Hallinger & Heck (1998). In this study, Hallinger and Heck (1998) reviewed the studies published between 1980-1985 investigating the association between student achievement and the leadership behaviors of school principals. The findings revealed a significant relationship between the leadership behaviors of school principals and school effectiveness, development, and student success (Hallinger & Heck, 1998). The third most influential article is "Reassessing the principal's role in school effectiveness: A review of empirical research, 1980-1995" by Hallinger & Heck (1996). In this study, the researchers reviewed the empirical literature on the role of school principals in school effectiveness and focused particularly on theoretical models and research methods. In particular, the studies conducted by Hallinger and Heck (1996, 1998) are literature reviews, and they might have been frequently cited thanks to research agenda propositions. On the other hand, three-quarters of the articles were published as of 2000. In this respect, the fact that the first three most cited articles were published in this period might be the reason for this finding.

The sixth research question addressed the most frequent author keywords. The concept of "keyword" refers to important words in any text or culture (Stubbs, 2010). The findings showed that the most frequently occurring terms other than the term "school effectiveness" were "school improvement," "leadership," "school leadership," and "principals." School improvement and school effectiveness have different origins. While school effectiveness focuses on "what works in education and why," school improvement is practice and policy-oriented and aims to change the school in the desired direction. The two concepts have much in common regarding focusing on output, input, processes, and context in education (Creemers, 2002). Besides, the two paradigms are of great importance to each other. When considering school improvement practices, it is clear that there is a need for information on school and classroom elements that need to be changed to improve outputs and processes. School effectiveness research provides this information. Similarly, school improvement and the resulting changes in class and school level can provide a testing ground for theories of school effectiveness (Reynolds & Stoll, 1996). These relationships between the two paradigms might have brought the term school improvement to the fore in school effectiveness research as the second most frequently occurring keyword. On the other hand, in studies conducted in different cultural contexts, it is stated that one of the most basic characteristics of effective schools is school principals who contribute significantly to the effectiveness of employees and student learning (Hallinger & Heck, 1998). Thus, other frequently occurring keywords are related to school management and leadership.

Another bibliometric indicator discussed in this study is the co-occurrence pattern of the keyword. At least 2 keywords co-occurrences were considered, and analysis was conducted on 46 keywords. The analysis yielded six clusters of keywords. In the first cluster, the red one, the co-occurring keywords are "school effectiveness", "school improvement", "educational policy(ies)", "accountability", "school climate", "educational effectiveness", "school reform", "teacher

effectiveness", "academic achievement", "urban education", "multi-level analysis", "school effects", "primary school", "school culture", "high schools", "educational effectiveness studies", "poverty" and "school self-evaluation". In the second cluster, the green, there are the concepts of "school leadership", "school principals", "school(s)", "student success", "instructional leadership", "teachers", "school management", "educational leadership", "trust", "educational administration", "school principal leadership" and "secondary education". In the third cluster, the orange, "evaluation", "assessment", "effectiveness" and "education" were the co-occurring keywords. "Leadership", "effective schools", "management" and "educational change" are the keywords in the fourth cluster, the blue. In the fifth cluster, the purple, "professional development" and "distributed leadership" and lastly, in the sixth cluster, the brown, "teacher education" and "learning" emerge as co-occurring keywords. In the first cluster, which is the largest one, there are concepts related to education policies and organization; in the second cluster, to school management and leadership; and in the third cluster, there are evaluation-centered concepts.

The eighth research question addressed the co-authorship pattern of school effectiveness research. In this sense, seven clusters emerged. While three of these clusters (red, purple, and green) are connected; four clusters (orange, brown, pink, and blue) are isolated. There are 14 authors in the red, purple, and green clusters that are connected. In the center of the red cluster, L.Kyriakides, J.V. Damme in the purple cluster, and S. Stringfield in the center of the green cluster. The authors are mostly from the same countries in the clusters, indicating low cross-country collaboration.

The last research question revealed the collaboration pattern between the countries. Since the late 1970s, the WoS database systematically contains the full addresses of all authors, thus allowing to measure the evolution of international collaboration (Gingras, 2014). The findings show that the Netherlands, Southern Cyprus, the United States of America, and the United Kingdom are the most collaborating countries. There are most collaborations between The Netherlands and Southern Cyprus, the United States of America and the United Kingdom, the United Kingdom and Southern Cyprus, and the United Kingdom and the Netherlands, respectively. These findings suggest that collaborations are mostly between the most productive countries of school effectiveness research, and there is limited collaboration between countries. The fact that research conducted in the human and social sciences mostly focuses on the results of national academic output (Ball, 2018) may be influential in this finding. Similarly, in a study investigating the collaboration between countries in the articles published in four different disciplines in the WoS database between 1980 and 2014, it was shown that the increase in international collaborations in social sciences and human sciences remained at a relatively lower level compared to the collaborations in natural sciences and engineering and biomedical fields (Gingras, 2014). On the other hand, cultural context and language differences are among the most important obstacles to international collaborations (Francisco, 2015). Similarly, this study reveals that international collaborations are relatively more common between English-speaking countries.

To conclude, this study reveals that there is a huge body of literature on school effectiveness, and the interest in the field has increased regularly in the last 40 years. On the other hand, the study reveals a need to improve international collaboration between countries and authors. The current research made a significant contribution to the literature in terms of revealing leading actors, resources, and articles in school effectiveness research.

Limitations of the Study

Although it has significant implications, the present study is without limitations. The data was retrieved from the WoS database and included the period between 1981-2021. In this context, a similar search could be conducted within the scope of the Scopus database. Journal articles were included in the analysis and were limited to English. Further research can expand the scope of the findings by including different publication types and languages in the analysis. Current research findings are limited to search terms used in the study. It should be considered that more

comprehensive findings can be reached by diversifying the terms. In addition, the bibliometric indicators used in the current research are limited. By using more complex bibliometric analyses such as topic modeling, the themes addressed in school effectiveness research can be revealed. In addition, co-citation analyses can be conducted.

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Statement of Contribution Rate

The whole process of the research was carried out by the sole declared author of the article.

Declaration of Conflict of Interest

As the author of the study, I declare no conflict of interest.

Statement of Publication Ethics

All the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed in the entire process, from the planning, implementation, data collection to the analysis of the data. None of the actions specified under the second section of the Directive, "Scientific Research and Publication Ethics Actions" have been carried out.

During the writing process of this study, scientific, ethical, and citation rules were followed; no falsification was made on the collected data, and this study was not sent to any other academic media for evaluation.

Research ethics committee approval information

Since this study retrieved the data from an open-access database and it is not included in the group of studies that require Ethics Committee Permission. Therefore, Ethics Committee Permission was not declared.

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GENİŞLETİLMİŞ ÖZ

Giriş

Tarihsel süreç içerisinde 50 yıldan uzun bir geçmişe sahip okul etkililiği araştırmaları oldukça zengin bir bilgi birikimine sahiptir. Google Scholar'da "school effectiveness" anahtar kelimesi ile arama yapıldığında yarım saniyede yaklaşık 5 milyona yakın; bir diğer önemli veri tabanı olan Education Resources Information Center (ERIC)'da ise aynı anahtar kelime ile 75 binin üzerinde sonuç listelenmektedir. Bu durum araştırmacılara sağladığı kolaylıklar yanında araştırmacıların okul etkililiği konusuna yönelik genel bir bakış açısı geliştirmeleri ve konuyu daha açık anlamaları noktasında bazı zorluklara neden olabilir (Cretu & Morandau, 2022). Nitekim, bu zorluğun üstesinden gelebilmek adına alanyazında okul etkililiğine yönelik sistematik derleme (Polatcan ve Cansoy, 2018), alanyazın taraması (Gilleece ve Clerkin, 2020; Luyten vd., 2005; Reynolds vd., 1994; Wang vd., 1993) ve meta-analiz (Mitchell, 2015; Scheerens, 2016; Scheerens vd., 2013) çalışmalarına rastlamak mümkündür. Bununla birlikte, mevcut araştırma kapsamında yürütülen detaylı alanyazın taraması neticesinde okul etkililiğine yönelik bibliyometrik bir araştırmaya rastlanmamıştır. Bibliyometrik analiz araştırmacılara herhangi bir alanda kaydedilmesi gereken ilerlemeyi değerlendirme, en güvenilir bilimsel yayınları tanımlama, yeni gelişmeleri değerlendirme amaçlı akademik bir temel oluşturma, önde gelen bilimsel aktörlerin tanımlanması, akademik çıktıların değerlendirilmesinde kullanılabilecek bibliyometrik indeksler geliştirme gibi imkanlar sunmaktadır (Gutierrez-Salcedo vd., 2018). Holden ve diğerleri'ne (2012) göre ise bibliyometrik analiz yönteminin büyük veri setlerinin, bilimin sosyolojisinin; çeşitli konu alanlarındaki ve ayrıca bireyler veya dergiler arasındaki yönelimlerin incelenmesini ve bireysel, kurumsal veya örgütsel meselelere yönelik karar verme süreçlerini kolaylaştırmaktadır. Sözü edilen avantajlardan ötürü diğer alanlarda olduğu gibi eğitim bilimleri alanyazınında da bibliyometrik yöntemi esas alan çalışmaların giderek arttığı görülmektedir (Bozdoğan, 2020; Gong vd., 2019; Gülmez vd., 2021; Dilekçi ve Manap, 2022; Xie, 2022; Yalçın ve Yayla, 2016; Zang vd., 2020). Bu doğrultuda, mevcut araştırma ile bibliyometrik analiz yönteminin yukarıda sözü edilen avantajlarından okul etkililiği konusu özelinde yararlanılması ve alanyazında mevcut boşluğun giderilmesi amaçlanmaktadır. Bu araştırma aşağıdaki sorulara yanıt aramaktadır:

1. Okul etkililiği araştırmaları yıllar içerisinde nasıl bir frekans dağılımı göstermektedir?
2. Okul etkililiği konusunda makale sayısı bağlamında en üretken araştırmacılar kimlerdir?
3. Okul etkililiği konusunda makale sayısı bağlamında en üretken dergiler nelerdir?
4. Okul etkililiği konusunda makale sayısı bağlamında en üretken ülkeler hangileridir?
5. Okul etkililiği konusunda toplam atıf sayısı bağlamında en sık atıflanan makaleler nelerdir?
6. Okul etkililiği araştırmalarında en sık tekrar eden yazar anahtar kelimeleri nelerdir?
7. Okul etkililiği araştırmalarında en sık tekrar eden yazar anahtar kelimelerinin birlikte görünürlüğü nasıldır?
8. Okul etkililiği araştırmalarında ortak yazarlık örüntüsü nasıldır?
9. Okul etkililiği konusunda en sık iş birliği hangi ülkeler arasında yürütülmektedir?

Yöntem

Araştırma kapsamında veriye Web of Science Core Collection (WoSCC) veri tabanından ulaşılmıştır. Bu veri tabanının tercih edilme sebebi taramanın eğitim ve eğitim araştırmaları (education and educational research) ile sınırlandırma imkanın olmasıdır. Ayrıca, Wang ve Waltman (2016) WoS dergi sınıflandırma sisteminin Scopus veri tabanına göre daha sağlıklı olduğunu ortaya koymuşlardır. Tarama işlemi 5 Mayıs 2022 tarihinde gerçekleştirilmiştir.

Tarama "topic" alanında, "school* effectiv*", "effectiv* school*", "effectiv* of school*", "effectiv* in school*" anahtar kelimeleri ile yürütülmüştür. Terimler arasında "or" kullanılarak kavramın olası bütün türlerine ulaşılması hedeflenmiştir.

İlk tarama neticesinde 3089 sonuca ulaşılmıştır. "Review" ve "Early Access" makaleler analiz dışı tutulduğunda 2780; 2022 yılına ait makaleler çıkarıldığında ise 2759 makale kalmıştır. Dergi makalesi olmayanlar hariç tutulduğunda 2150; "Education Educational Research" kategorisi ile

kısıtlandığında ise 1251 makale kalmıştır. Son olarak yayın dili İngilizce ile kısıtlandığında 1112 makale kalmıştır. Bu aşamadan sonra veri seti araştırmacı tarafından kontrol edilmiş 10 makalenin yayım yılının 2022 olduğu belirlenmiş ve bu makaleler de analiz dışı tutulmuştur. Böylece veri analizi 1102 makale üzerinden yürütülmüştür.

Veri analizi RStudio Biblioshiny eklentisi ile yürütülmüştür. Veri analizinde Zupic ve Cater (2015) tarafından önerilen beş aşamalı süreç takip edilmiştir. Söz konusu aşamalar araştırma desenine (araştırma sorusu ve araştırma sorusuna uygun bibliyometrik yöntemin seçilmesi) karar verilmesi, bibliyometrik verinin derlenmesi (veri tabanının seçimi, bibliyometrik verinin filtrelenmesi ve indirilmesi), analiz (uygun yazılımın seçimi, verinin temizlenmesi) ve bulguların yorumlanması (bulguların tanımlanması ve yorumlanması) şeklindedir.

Veri analizinde performans analizi ve bilimsel haritalama olmak üzere iki temel prosedürden yararlanılmıştır (Noyons vd., 1999). Performans analizi bireylerin ve kurumların yayın ve araştırma performansını değerlendirmeyi; bilimsel haritalama ise bilimsel araştırma alanlarının yapısını ve dinamiklerini ortaya koymayı amaçlamaktadır (Zupic & Cater, 2015). Performans analizi kapsamında "okul etkililiği" araştırmalarının yıllara göre frekans dağılımı, makale sayısına göre en üretken yazarlar, h indeksi temelinde en etkili yazarlar, makale sayısına göre en üretken dergiler, h indeksi temelinde en etkili dergiler, makale sayısına göre en üretken ülkeler, en sık kullanılan yazar anahtar kelimeleri, toplam atıf sayısına göre en etkili makaleler belirlenmiş; bilimsel haritalama kapsamında ise anahtar kelimelerin birlikte görünürlüğü ve ülkelerarası işbirliği ortaya konmuştur.

Bulgular

1981-2021 tarihleri arasında 233 kaynakta yayımlanan 1102 dergi makalesi incelenmiştir. Elde edilen bulgular araştırmaların niceliğinde düzenli bir artış kaydedildiğini göstermektedir. On yıllık periyotlar halinde incelendiğinde, özellikle 1990'lı yılların ortalarından itibaren önemli bir artış olduğu; bununla birlikte, en önemli artışın 2010-2020 yılları arasında kaydedildiği ve araştırma kapsamında incelenen makalelerin yarısından fazlasının bu süreçte yayımlandığı anlaşılmaktadır. Leonidas Kyriakides, Bert P.M. Creemers ve Philip Hallinger en üretken ilk üç araştırmacı olarak göze çarpmaktadır. Öte yandan, bu araştırmacılar atıf sayısı bağlamında da ilk üç sırada yer almaktadır. Elde edilen bu bulgular, araştırmacılar tarafından ortaya konulan bilimsel üretimin hem nitelik hem de nicelik bakımından üst düzeyde olduğunu göstermektedir. Makale sayısı bağlamında "School Effectiveness and School Improvement", "Educational Administration Quarterly" ve "School Leadership & Management" ilk üç sırada yer almaktadır. En üretken ülkeler olarak Amerika Birleşik Devletleri, Birleşik Krallık, Avustralya ve Hollanda ön plana çıkmıştır. "School effectiveness" teriminin ardından en sık tekrar eden yazar anahtar kelimeleri "school improvement", "leadership", "school leadership" ve "principals" olarak belirlenmiştir. Anahtar kelimelerin birlikte görünürlük ağı incelendiğinde altı küme oluşmuştur. Son olarak, araştırma bulguları Hollanda, Güney Kıbrıs Rum Kesimi, Amerika Birleşik Devletleri ve Birleşik Krallık gibi ülkelerin iş birliği konusunda ön plana çıktığını göstermektedir.

Sonuç

Araştırma sonucunda, alanyazında okul etkililiği konusunda önemli bir bilgi birikimin oluştuğu ve araştırma alanına olan ilginin son 40 yıllık süreç içerisinde düzenli bir artış gösterdiği tespit edilmiştir. Okul etkililiği araştırmalarına katkı sunan yazar ve ülkelerin kısıtlı olduğu ifade edilebilir. Araştırma sonuçları konu alanına katkı sunan yazar ve ülkeler arasında iş birliğinin artması gerekliliğine işaret etmekte; okul etkililiği konu alanında önemli aktörleri, kaynakları ve makaleleri ortaya koyması açısından konuya ilgi duyan araştırmacılar açısından önemli içerimler barındırmaktadır.