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A Bibliometric Analysis: Development of Elementary School Research in 2019-2023:

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Abstrak: *This study aims to explore research trends that are developing in elementary schools. This study uses Scopus search analysis and VOSviewer software. Based on 42,017 article documents from 2019-2023 taken from Scopus indexed journals on 3 July 2023, co-authorship, co-citation, co-occurrence, and content analysis were carried out. The results of the quantitative analysis show that there are very many publications at the elementary school level, namely social science, psychology, and computer science. The literature on research in elementary schools has explored several hot themes over the last five years, including: covid-19, mental health, anxiety, bullying, qualitative research, educational computing, motor skills, online learning, and virtual reality. The bibliometric study carried out provides a thorough and complete picture of the development of research in elementary schools which may be valuable for researchers who are interested in developing research in elementary schools in the future. So, the researchers suggest exploring this trending research topic.*

Keywords*: research, elementary school, VOSviewer*

INTRODUCTION

Education is one of the important sectors and is a priority in the country's development process. The state has a great responsibility towards education as an effort to form the next generation of the nation. A few educational policies and programs continue to be implemented and fought for so that the education sector continues to develop and improve. Quantitatively, the implementation and fulfilment of the right to obtain education for citizens can almost be realized. This can be seen by the continued increase in school enrolment rates in formal education and gross enrolments rates. The enrolments rate for ages 7 to 12 years has reached 98%, ages 13–15 years 94.79%, and ages 16–18 years 70.68%. This shows that at school age 7 to 15 years almost all of them have attended formal education which in this age range is Elementary School (SD) and equivalent, and Junior High School (SMP) and equivalent (Alawiyah, 2017).

SD and Madrasah Ibtidaiyah (MI) or other similar forms and SMP and Madrasah Tsanawiyah (MTs) or other similar forms are basic educational institutions. In basic education there will be the laying of the foundation of human development because basic education is education that provides knowledge and skills, fosters the basic attitudes needed in society, and

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prepares students to attend secondary education. Basic education is organized to provide the basic provisions needed to live in society in the form of developing basic attitudes, knowledge and skills (Saúd & Sumantri, 2003).

However, the task of the education sector is not only to achieve the quantity of education, equity in education, or fulfilment of the right to education, more than that the quality of its implementation must also be considered. The problem is the achievement of fulfilling the quantity has not been compared with the achievement of the quality of education. Currently education in Indonesia is still unable to compete with other developed countries. This is shown by the results of the 2018 PISA (Program for International Student Assessment) study, Indonesia is ranked 70th out of 78 countries (Chyalutfa et al., 2022) Even globally, Indonesia is in 108th position in the world with a score of 0.603 (Alawiyah, 2017). This fact indicates that there are weaknesses in the implementation of education and is a big challenge for the country to continue to improve the standards of education delivery so that it can compete with other countries (Putri et al., 2022).

Apart from being a challenge for the country, this is also an important task for teachers as one of the key components (Suratmi & Sopandi, 2022) in improving the quality of education and overcoming very basic weaknesses including the low creativity and innovation of teachers in developing their skills (Ritonga et al., 2022). The role of the teacher is very important in creating an effective learning environment and having a positive impact on student development. For example, providing effective learning, creating a positive learning environment, supporting social and emotional development, paying attention to the needs and potential of students, providing feedback and evaluation, increasing motivation and independent learning, and so on. To be able to do this, the teacher must know the conditions of the students and their learning environment, one of which must be through research. Through research teachers can improve the quality of learning and develop professional careers (Tulung et al., 2022).

This study aims to conduct a bibliometric study to thoroughly describe how research in elementary schools has become a trend over the last five years, internal relationships between articles, existing country collaboration networks, the evolution of research and hot topics related to this research using the Scopus database. By using scientific mapping methods through the structure of intellectual, conceptual, and social networks as well as the evolution and performance of the various studies studied. This study contributes to the presentation of quantitative data and qualitative analysis for the evolution and current trends of research in elementary schools as a reference for further research. In other words, this study seeks to address the relationship between the themes, the possibility of further research, the novelty of the research, and the gaps between the studies by considering the publication (Novia et al., 2022, Novia et al., 2021) that have been published in Scopus indexed journals between 2019 and 2023.

METHODS

This study used bibliometric analysis using the five standards of Zupic and Cater, namely study design, data collection, data analysis, visualization, and interpretation (Zupic &

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Čater, 2015). The bibliometric analysis method is used to describe the mapping of knowledge, concepts or topics as a whole and shows research trends and the process of evolution of a field of knowledge (Cipta et al., 2023). The bibliometric approach used in this study uses modern technology in information engineering, database management and statistics by combining VOSviewer software. The research steps can be seen in Figure 1.

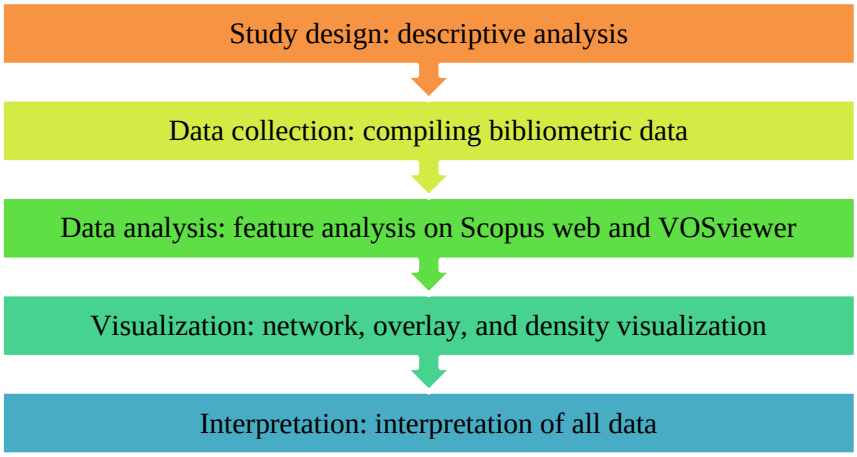

Figure 1. Zupic & Cater Standard Workflow

First, study design. This step analyses descriptively the relevant information regarding various studies in elementary schools so that the researcher gets an overview of evolutionary metrics from this study. *Second*, data collection. This step is carried out by compiling bibliometric data to build data and determine research sources from the Scopus database. The selection of Scopus was based on the consideration that the Scopus database is widely known and widely used for the analysis of reputable scientific articles. Scopus is a database of abstracts and citations for peer-reviewed literature and is also part of SciVerse provided by Elsevier as described in the previous section and is also based on the same database as Science Direct (Franceschini et al., 2016). The keyword used to search for documents is elementary school. These keywords make it easier to find documents that match the problems of this research. The search results obtained 42,017 documents, then after specifying the 2019-2023 range, type of article document, and conference paper, final publication stage, search type of journal and conference proceedings and in English, based on this selection, the existing database totalled 953 documents.

Third, data analysis. This step was carried out by analysing the data using the feature application on the Scopus web, and VOSviewer software version 1.6.15.0. *Fourth*, Visualization. This step is carried out with the visualization provided by the VOSviewer software, namely network visualization, overlay visualization and density visualization. This step is used to facilitate understanding and interpretation of research conducted on research data in elementary schools. *Lastly*, Interpretation. This step is carried out by interpreting all the data obtained in this bibliometric study. The purpose of this step is to obtain a summary and conclusion of the various findings in this study.

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RESULT AND DISCUSSION

The results of the documents from the Scopus database that have been specified in this study are as many as 953 documents. The research trend in elementary schools from 2019 to 2023 based on publications published annually on the Scopus dataset can be seen in Figure 2 which shows that the research trend in elementary schools increased from 2019 to 2020 as many as 39 further documents from 2020 to 2021 decreased by 19 documents and rose again from 20 21 to 2022 as many as 5 documents. Furthermore, from 2022 to 2023 it is not certain whether it will increase or decrease because 2023 has not ended. Hopefully this research will motivate researchers and lecturers to conduct research in elementary schools and publish their research results in Scopus indexed journals so that the number of research publications in elementary schools will increase in 2023. Meanwhile, the number of citations to research documents in elementary schools from 2019 to 2023 will increase.

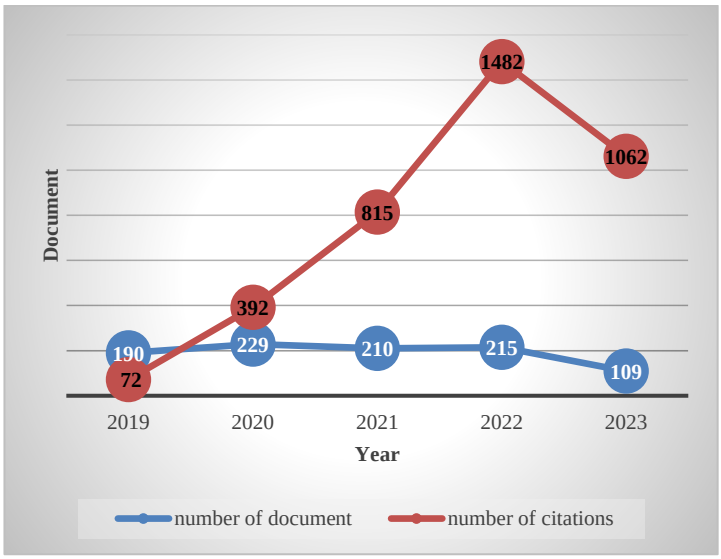

Figure 2. The Development of Publication and Citation in Elementary School Research

Furthermore, situation analysis, this analysis is used to analyse the relationship between publications by identifying the most influential publications (Donthu et al., 2021). Based on the type of documents obtained, it can be seen based on direct analysis from the Scopus web that the country that contributed the most was the United States with the highest number of citations, namely 1,565. Table 1 shows the 10 countries that have contributed the most to primary school research.

Table 1. 10 Top Countries Research Publications in Elementary Schools

Country	Documents	Citations
United States	259	1.565
Indonesia	238	534

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Germany	49	403
Japan	37	102
Canada	35	150
Spain	29	216
Brazil	27	72
Israel	23	107
United Kingdom	23	157
China	22	133

Source: analyze result Scopus

The next analysis is an analysis of the search results for the top 10 authors, which can be seen in Table 2. This data shows that among the authors mentioned in Table 2, research in elementary schools allows for authors who have fewer publications but have more citations, or preferably. In addition, the large number of publications indicates the regularity of contributions on the topic in the period 2019 to 2023.

Table 2. 10 Top Author of Research Publications in Elementary Schools

Country	**Documents**	**Citations**
Suryana, D.	7	8
Rachmadtullah, R.	6	19
Caldarella, P.	5	72
Gunarhadi	5	38
Herwin, H.	5	35
Wills, H.P.	5	72
Banner, I.	4	3
Einav, Y.	4	3
Friman, H.	4	3
Nunez, J.C.	4	43

Source: analyze result Scopus

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To find out the conceptual structure of research in elementary schools, co-word analysis was carried out which was mapped and grouped into co-occurrence as shown in Figure 3, which shows that each node represents one keyword. So, the larger the node size indicates the greater the frequency of these keywords. Then, we can also see that each node in Figure 3 is connected by links. The wider the link, the greater the link between the two keywords, the image only contains a maximum of 300 nodes with the highest degree to represent keywords (Wang & Chai, 2018).

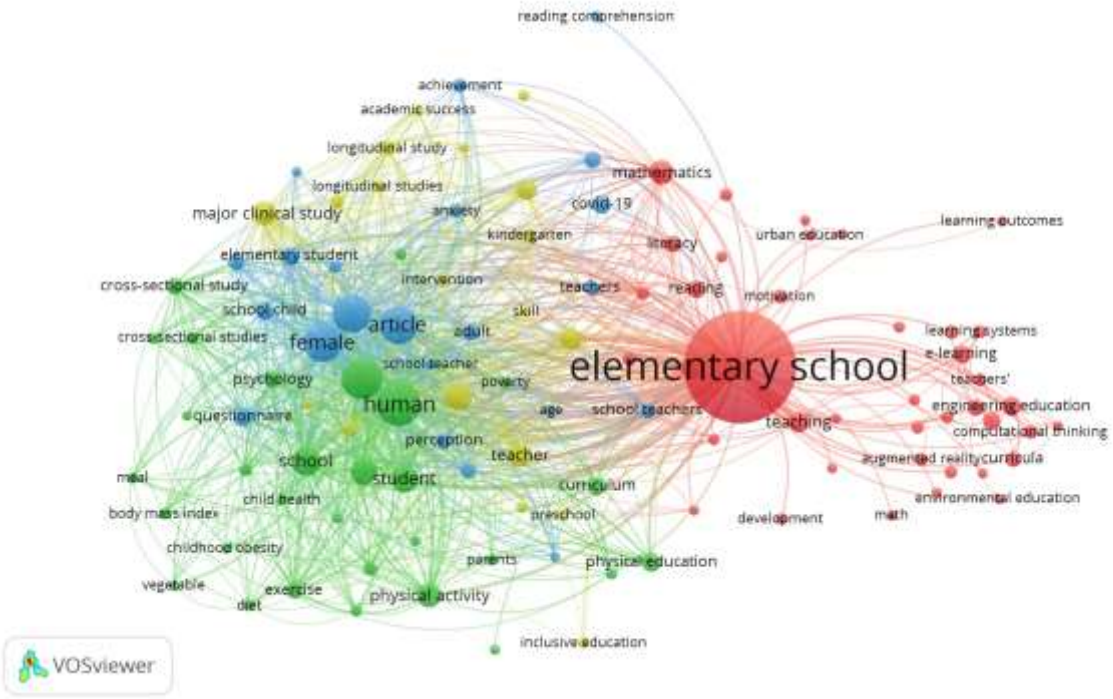

Figure 3. The Network Visualisation of Emerging Keywords on Elementary School

Figure 3 illustrates that the biggest note in this study is elementary school, this indicates that elementary school is the most popular keyword. In addition, other major nodes namely human, child, article, female, and male are other popular keywords after elementary school. Figure 3 also shows that the widest link is elementary school with mathematics, learning, teacher, and student which shows its connection with elementary schools, so that research on these keywords can be studied in more depth for further research.

Figure 3 also shows 4 different colors, this shows that there are 4 clusters identified in the results of the analysis using VOSviewer, including cluster 1 in red which is the most popular consisting of 40 keywords. The keywords that appear most often are mathematics and engineering education. Green cluster 2 consists of 30 keywords. The keywords at the top of the sequence are child, school, and controlled study. Cluster 3 in blue consists of 22 keywords with the top keywords being article, male and female. Cluster 4 in yellow has 19 keywords, with the terms learning, experiment, teacher, and academic achievement being the top keywords. The keywords in these various clusters show the research relationship between one term and another related to research in elementary schools. For example, cluster 1 which connects research that

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has been conducted in elementary schools on the subject area of mathematics regarding literacy or the subject area of mathematics regarding learning outcomes.

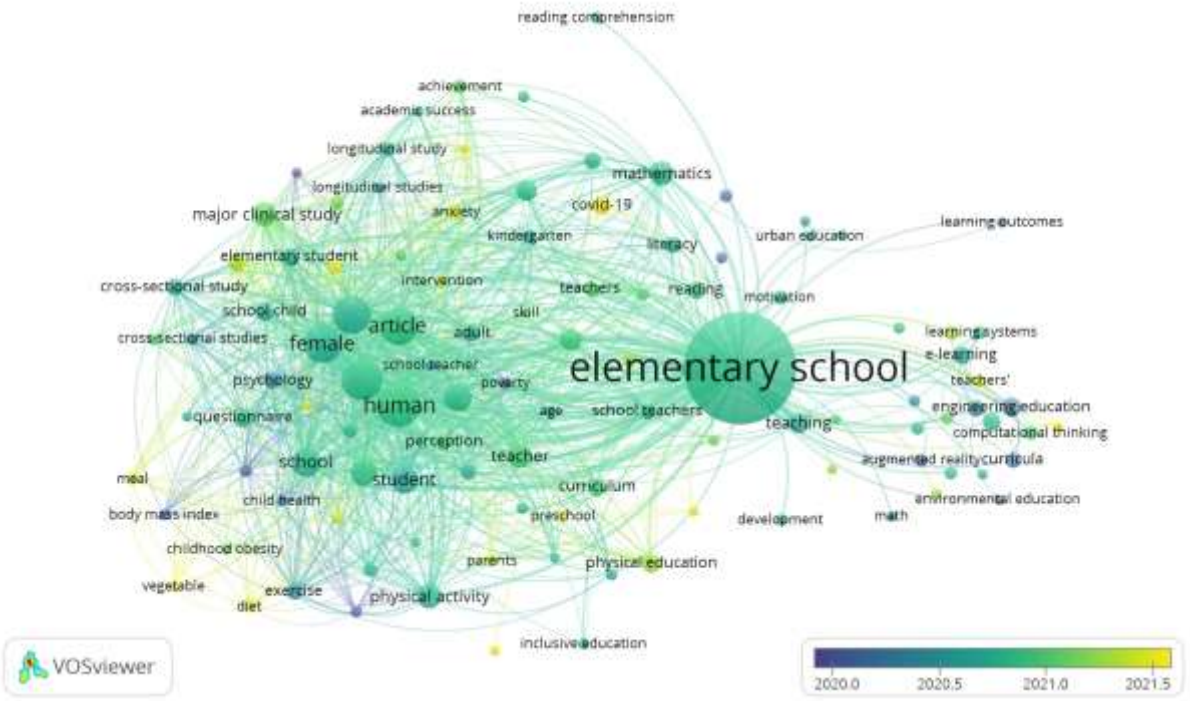

Figure 4. The Overlay Visualisation of Emerging Keywords on Elementary School

The results of the overlay visualization on VOSviewer show various keywords that indicate the latest research with light green to yellow indications in the period 2021 to 2023. Based on the results of the overlay visualization in Figure 4, it can be shown that several terms clearly appear new and are the latest research trends that related to this study include covid-19, mental health, anxiety, bullying, qualitative research, educational computing, motor skills, online learning, and virtual reality. So, it can be concluded that research in elementary schools is still very relevant to do because it is included in new research trends even though it has been carried out since the past until now such as data from Scopus and the results of analysis of studies that have been obtained. Research in elementary schools is still very relevant because elementary schools are the initial stage of the next school. If problems at the elementary school level can be solved, it is likely that problems at higher schools will not overlap. This is in line with the statement that a solid foundation in education is important for children's long-term academic success (Schaeffer et al., 2021) and schools influence the hierarchical arrangement of education (Noyes, 2012).

CONCLUSIONS

This study conducted a bibliometric analysis of 953 selected documents from the Scopus web related to research in elementary schools using Zupic and Cater's work standards and the

VOSviewer application. The results of this study reveal that several topics that have become recent research trends and are related to this study include studies on *covid-19, mental health, anxiety, bullying, qualitative research, educational computing, motor skills, online learning, and virtual reality*. The bibliometric study conducted can provide a thorough and complete picture of research in elementary schools which is valuable for researchers for the development of future research in this field.

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