

Bibliometric Analysis of Teacher Self-Efficacy in Primary Education

Aulia Wulandari¹, Sukarno², Matsuri³

¹ Universitas Sebelas Maret, Indonesia; aulia_s032108001@student.uns.ac.id

² Universitas Sebelas Maret, Indonesia; sukarno57@gmail.com

³ Universitas Sebelas Maret, Indonesia; matsuri@staff.uns.ac.id

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ABSTRACT

Teacher self-efficacy is the ability to believe in controlling or mastering certain situations. The level of self-efficacy of elementary school teachers will affect their work. This study aims to uncover study trends related to primary school teacher self-efficacy over the last three decades by using bibliometric analysis. The Scopus database was used to collect articles that matched the criteria, eventually yielding 164 articles from 1994–2022. The results showed that "self-efficacy" was the most widely used keyword in article publications, while the researchers focused on teacher self-efficacy in elementary schools. Turkey, Australia, and China are the countries that produce the most publications in this field. The journals that produce the most publications are the International Journal of Inclusion and Egitim ve Bilim. Betoret f.d, Palmer d, and De Veve d are the authors with the highest number of citations. Based on the results of this analysis, it shows that "self-efficacy, teacher self-efficacy, and inclusive education" are the most recently used keywords in the article. The results of this study indicate that in addition to well-known countries that discuss teacher self-efficacy in primary school education, this study also needs to be carried out in other developing countries. It is suggested that developing countries can develop research in this area and that teacher self-efficacy should be more focused on teacher self-development and teacher confidence when teaching.

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Corresponding Author:

Aulia Wulandari

Universitas Sebelas Maret; aulia_s032108001@student.uns.ac.id

1. INTRODUCTION

The ability of teachers to manage emotional intelligence is considered very important. Each teacher has different characteristics and psychological factors that affect teacher performance (Fathi & Derakhshan, 2019). Self-efficacy is a person's confidence in being able to carry out behaviour in order to get results (Bandura, 1977). Self-efficacy beliefs have consistently had an effect on achieving achievement

goals (Chang, Hall, Lee, & Wang, 2022). A previous study has revealed that self-efficacy is a very important aspect in helping teachers achieve teaching goals and optimize teacher performance (Ramdani, Tae, Prakoso, & Luanganggoon, 2021). Furthermore, teacher self-efficacy can be predicted through job satisfaction (Burić & Kim, 2021). Teachers with high self-efficacy are more open to using new learning methods; setting new goals that are more challenging; and having a better level of planning and organizing things (Lazarides & Warner, 2020).

The Teachers must be able to manage themselves when dealing with the environment because it will greatly affect their performance. A teacher is, of course, involved in several activities that require social interaction in the school environment (Atmaca, Rızaoğlu, Türkdoğan, & Yaylı, 2020; Ismayilova & Klassen, 2019). So it is important for teachers to have personal abilities, especially self-efficacy, which will be useful as internal psychological directors and social aspects so that learning can be carried out professionally (Marschall & Watson, 2019, 2022). The number of factors that can affect teacher self-efficacy often causes teachers to be less aware of their self-efficacy. As an important role in the classroom, the teacher should have confidence that they are able to provide encouragement to other individuals to be able to do and achieve something.

Developing teacher relationships and a healthy work environment is the focus of the current study (Chang et al., 2022; Fackler, Malmberg, & Sammons, 2021; Fernet, Trépanier, Austin, & Levesque-Côté, 2016). Teachers with various characteristics and psychological conditions are one of the reasons that affect teacher performance when teaching (Fathi & Derakhshan, 2019). Several facts suggest that teacher self-efficacy is a key factor in improving the quality of teaching and teacher performance (Baluyos, Rivera, & Baluyos, 2019; Burić & Moè, 2020; Perera et al., 2021). In line with this, teacher confidence also increases student achievement and motivation when learning. Positive emotions that teachers have will improve teaching, support the well-being and instructional behavior, and cognitive, emotional, and motivational outcomes of students (Burić & Kim, 2020; Granziera & Perera, 2019; von Suchodoletz, Jamil, Larsen, & Hamre, 2018).

It is not uncommon for teachers to feel less confident when teaching students (Ryan & Mathews, 2022). Teachers have a very crucial role in teaching activities through teaching and shaping the mindset of students. Thus, teachers with negative behaviour can negatively influence students during teaching (Muhonen, Pakarinen, Rasku-Puttonen, & Lerkkanen, 2021; Shukla, Kuril, & Chand, 2020). The interaction between a teacher and the school environment when viewed from a theoretical perspective (Bandura, 1977). The first is the relationship between teacher self-efficacy and teacher behavior during teaching. It is not clear that the relationship between a teacher's self-efficacy is generalized to the level of school organization. Second, there is still a lack of discussion regarding individual teachers and their co-workers. So that a teacher will have low or high self-efficacy when working with his colleagues. Third, the need to provide resources for teacher instruction. The balanced relationship between a teacher's self-efficacy beliefs and the characteristics of the school (Holzberger, Maurer, Kunina-Habenicht, & Kunter, 2021; Holzberger & Prestele, 2021).

This study looks at the development of publications related to teacher self-efficacy, especially in primary education. In the development of teacher self-efficacy publications, it is known that there are differences in teacher self-efficacy in ordinary primary schools and inclusive primary schools. These differences, of course, come from challenges, pressures, and differences in attitudes and behaviours of students, which result in differences in the level of teacher self-efficacy when teaching (Finch, Akhavein, Patwardhan, & Clark, 2023; Gkontelos, Vaiopoulou, & Stamovlasis, 2023; Jōgi, Aulén, Pakarinen, & Lerkkanen, 2022; Primahardani, 2022). Therefore, researchers are interested in examining teacher self-efficacy in primary education using bibliometric analysis. The use of this method is considered to see the results of the study through a broader perspective on past studies. This unique opportunity is created in theoretical and practical study through bibliometrics because many journals and scholars have published articles from various disciplines that have an impact on the use of bibliometrics to study changes in various fields and emerging trends (Gureyev & Mazov, 2022; Mukherjee, Lim, Kumar, & Donthu, 2022; Wagner, Whetsell, & Mukherjee, 2019).

Based on the explanation described above, research on teacher self-efficacy has been widely carried out, especially in primary schools. This study aims to map and see existing research results through bibliometric analysis in the form of a year of publication, most frequently used keywords, country, and publication with the most citations. This bibliometric analysis seeks to identify gaps and provide explanations regarding future research needs. The research questions from this research are as follows:

- 1) How is the distribution of publications based on year, country, affiliation, and document type on the Scopus website?
- 2) How are bibliographic coupling (co-occurrence, source, and document) and co-occurrence analysis derived from VOSviewer mapping?

2. METHODS

The study that uses bibliometric methods is used to present research results related to the self-efficacy of elementary school teachers. Thus, this study offers an opportunity to look at the dynamics from a broader perspective. The process of data collection and analysis is shown below.

Bibliometric Analysis Data Collection Process

This study aims to conduct a bibliometric analysis of the characteristics of publications and research trends in the field of teacher self-efficacy and primary school education. There was a significant increase in research, so the bibliometric method was chosen in order to analyze data and filter studies through statistical analysis of publications such as authors, subjects, citations, publication-related information, and citing sources. The keywords "teacher self-efficacy" and "primary school" were used in the data collection process. A search through the database was conducted on 18.06.2022 on the Scopus website to collect documents. From the search results, the oldest research using these keywords that appeared in the title, abstract, and keywords was published in 1994. A keyword search was carried out to find the appropriate data set, namely: (TITLE (teacher* AND self-efficacy*) AND TITLE-ABSTRACT (primary* AND school*)). The use of an asterisk (query) is used to make it easier to search for data through keywords so that similar keywords are not missed. From the search data obtained from as many as 164 documents (1994–2022). The data that has been obtained through the Scopus website is exported as a CSV file type so that later it can be read on the VOSviewer application.

Data analysis

The bibliometric analysis and its visualization were carried out through the VOSviewer software. The software used is VOSviewer (version 1.8.16), which can be used for free by downloading via (<https://www.vosviewer.com>). In the process of using this software, it can directly display interpretations and data maps. The use of VOSviewer software can visualize a network of journals, researchers, or publications according to citations, bibliographic or author relationships according to keywords contained in the document (Aktoprak & Hursen, 2022; Hernández-Torrano & Ibrayeva, 2020). The display of items in this software becomes a very interesting object and represents the author, country, and keywords. Items and links that appear together form a network and a cluster. The size of the displayed item represents the number of times that item appears, and the colour represents the cluster. The thicker the colour line indicates the strength between the items, which reveals the relationship between the items.

3. FINDINGS AND DISCUSSION

3.1 Distribution of Publications by Year, Country, Affiliation, and Document Type

3.1.1 Distribution of publications by year

Based on the results of an analysis of the distribution of publications on teacher self-efficacy, there will be an increase in the number of publications in 2021. These findings reveal an increase in interest in teacher self-efficacy. The results of the distribution of publications by year can be seen in Figure 1.

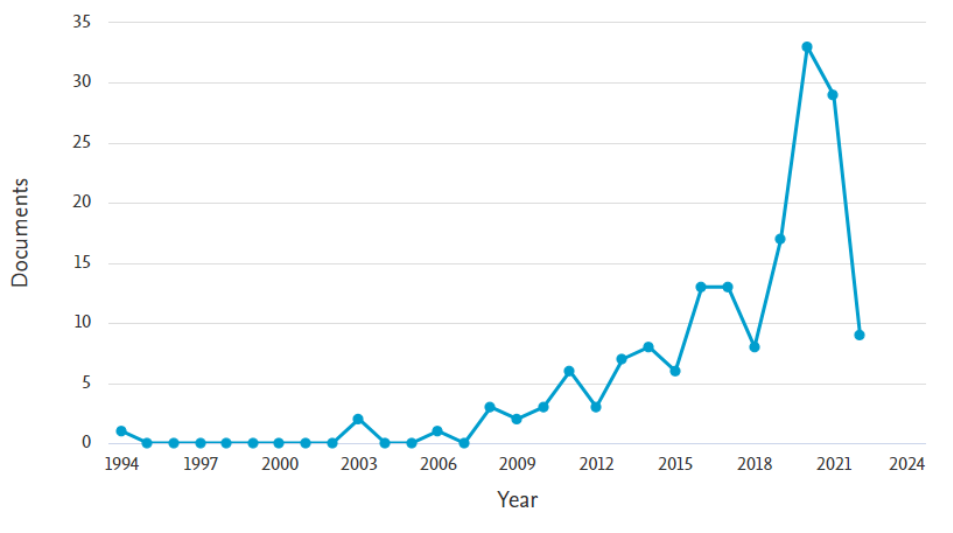


Figure 1. Distribution of Publications by Year

The Scopus database records the first published articles in 1994. It can be observed that only 1 to 4 articles were published between 1994-2009. Furthermore, there was a significant increase in 2011.

3.1.2 Distribution of Publications by Country

The results of the distribution of publications by country are presented in Figure.2.

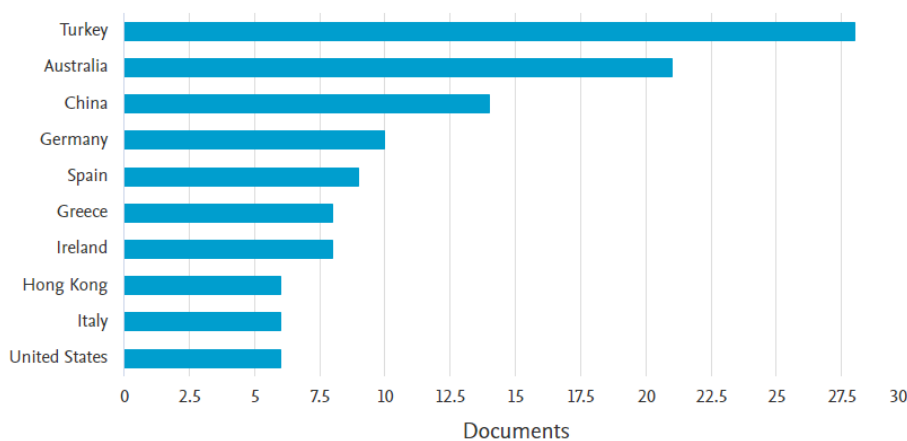


Figure 2. Distribution of Publications by Country

Based on the findings, there are 10 countries that have more publications than other countries. Turkey became the first country to have the highest publication, followed by Australia, China, Germany, and so on.

3.1.3 Distribution of Publications by Affiliation

The results of the distribution of publications by affiliation are presented in Figure 3.

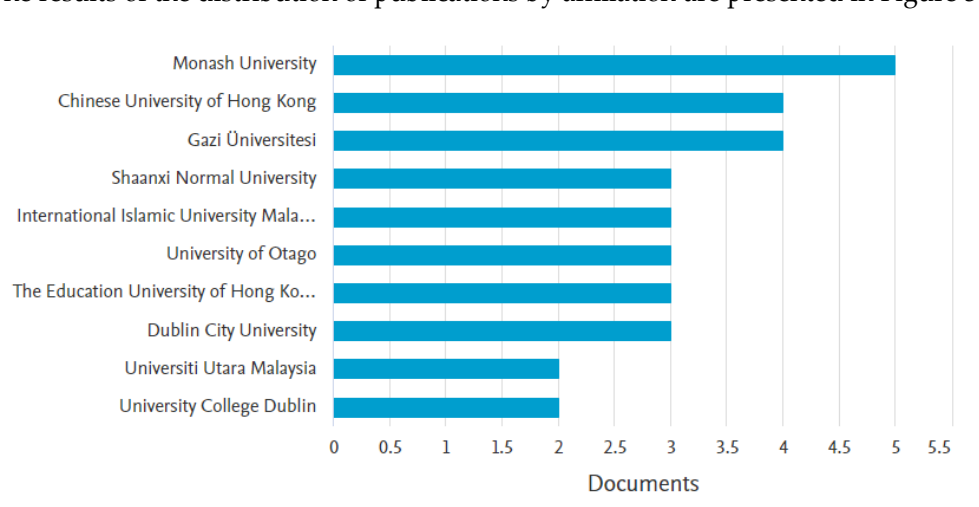


Figure 3. Distribution of Publications by Affiliation

The 10 most popular universities in publishing fields and research interests on teacher self-efficacy are presented. Monash University is the university with the most publications, with 5 publications, followed by the Chinese University of Hong Kong and Gazi Üniversitesi with 4 publications each, and so on.

3.1.4 Distribution of Publications by Document Type

The results of the distribution of publications by document type are presented in Figure 4.

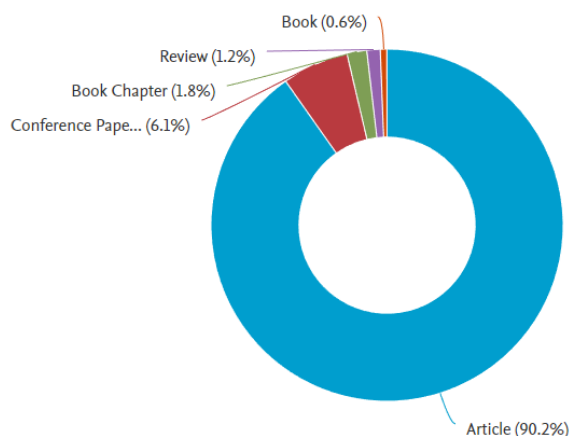


Figure 4. Distribution of Publications by Document Type

Of the several types of documents displayed, the most widely used document types in publications are articles with a percentage of 90.2%, conference papers (6.1%), book chapters (1.8%), reviews (1.2%), and books (0.6%).

3.2 Bibliographic Coupling (Co-occurrence, Source and Document) and Co-occurrence Analysis

The author presents the relationships between countries that have the most widely used relationship links, sources, documents, and keywords.

3.2.1 Country Bibliographic Coupling

The findings of the analysis reveal the similarity of publications from several countries. From the results of the bibliographic mapping, each country that is an item has its own colour and gets a cluster according to the colour of that country. The country that has the strongest relationship will be seen by the thickness of the link color on the map. In the results of the analysis, the number of publications, at least from a country, is determined to be 2, with a total of 46 countries and only 30 countries that meet the category. Only the countries with the strongest link relationships are selected. The total link strength of the bibliographical links by country was calculated. The first country seen in Turkey, with 28 published documents with 169 citations and 3977 link strengths. Color differences indicate that there are different clusters and they are connected to each other. This means that countries that are in the same cluster more often quote each other. Countries that are interconnected include the first, Turkey, Greece, Switzerland, Italy, Indonesia, the Netherlands, Norway, Pakistan, and Peru. The two are China (Hong Kong, Malaysia, South Korea, Taiwan, Thailand, and the USA. Cyprus, Ireland, Jordan, New Zealand, and UK activities fourth are Belgium, Germany, India, and South Africa. Australia, Chile, and Spain. Finally, there are the Czech Republic and Slovakia.

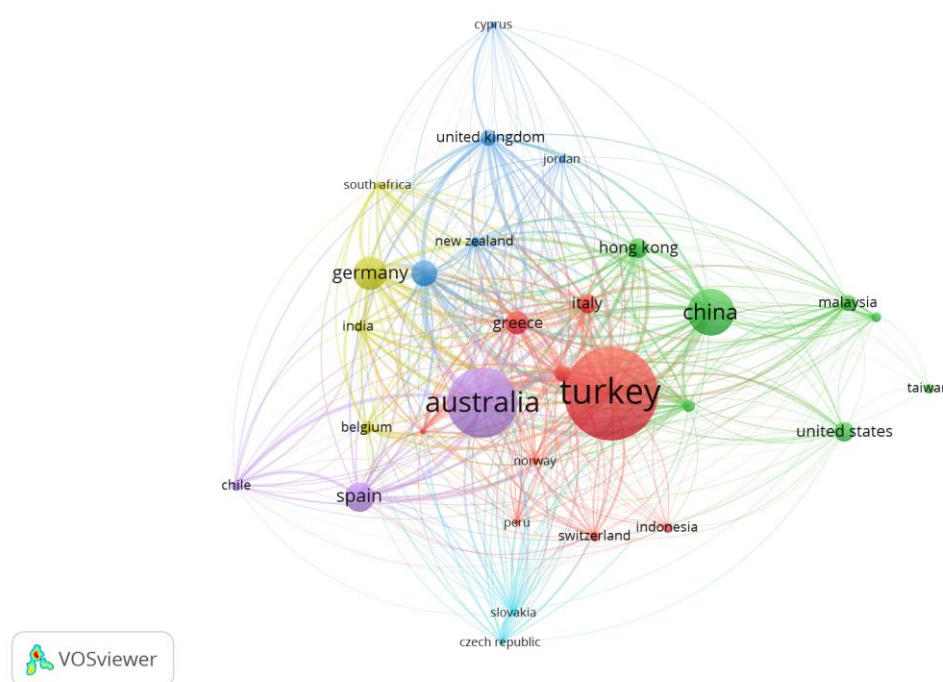


Figure 5. Bibliographic Coupling by Countries (Network Visualization)

3.2.2 Source-Based Bibliographic Coupling (Journal)

The main sources of publications on teacher self-efficacy in primary schools and visualization overlays along with the connecting links are presented in Figure 6. The findings reveal that bibliographic coupling, according to this source can be a guide for researchers on where to look for sources that match the self-efficacy of elementary school teachers. The criteria for selecting data by choosing the least number of publications on a source are determined to be 4. With a total of 116 sources, there are 13 journals that meet the category. According to known journals, the total strength of bibliographic coupling is that the International Journal of Inclusion and Egitim ve Bilim have the highest related link strength.

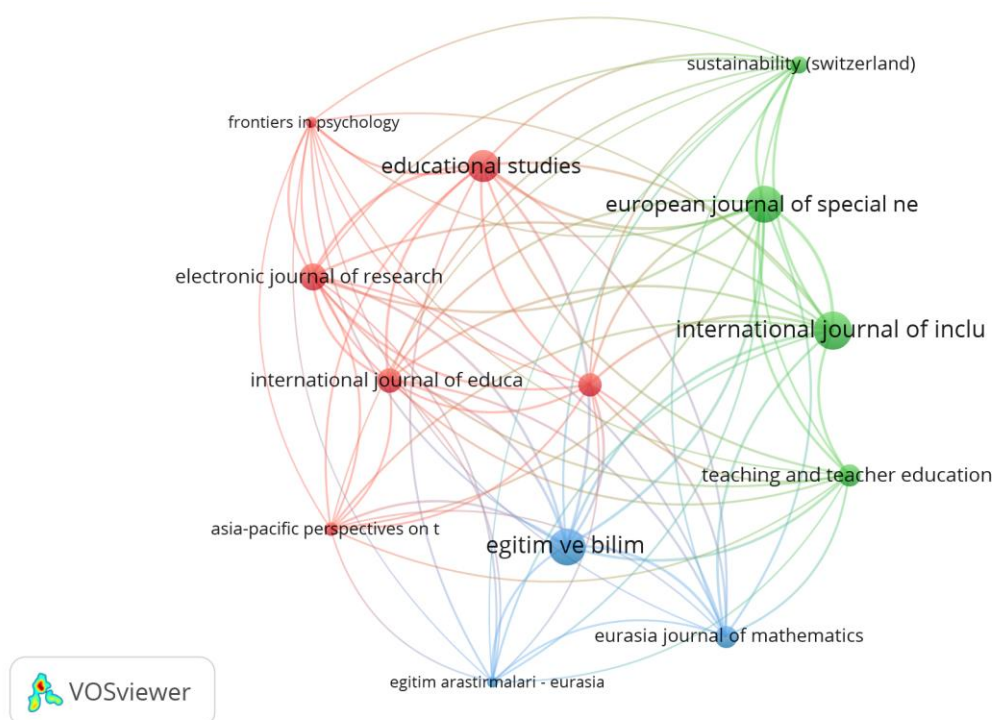


Figure 6. Bibliographic Coupling by Sources (Network Visualization)

3.2.3 Bibliography coupling by document

The bibliographic relationship by document shows readers the relationship between the numbers of documents that other researchers have used. In other words, how high is the usage of the document when it is combined with the other documents presented in Figure 7? The search criteria that have been determined are that the minimum number of citations in a document is 4. Based on 164 documents, it is known that 83 documents meet the criteria. Based on the results of visual mapping, the number of citations and the number of the strongest links have been calculated for each document. The publication with the most citations, with a total of 132 citations and a total link strength of 42 (Betoret, 2009). Furthermore, the second publication with the most citations, with a total count of 102, has a link strength of 82 (Palmer, 2006). (De Neve, Devos, & Tuytens, 2015) became the publication with the most link strength, namely 213 and citations of as many as 83.

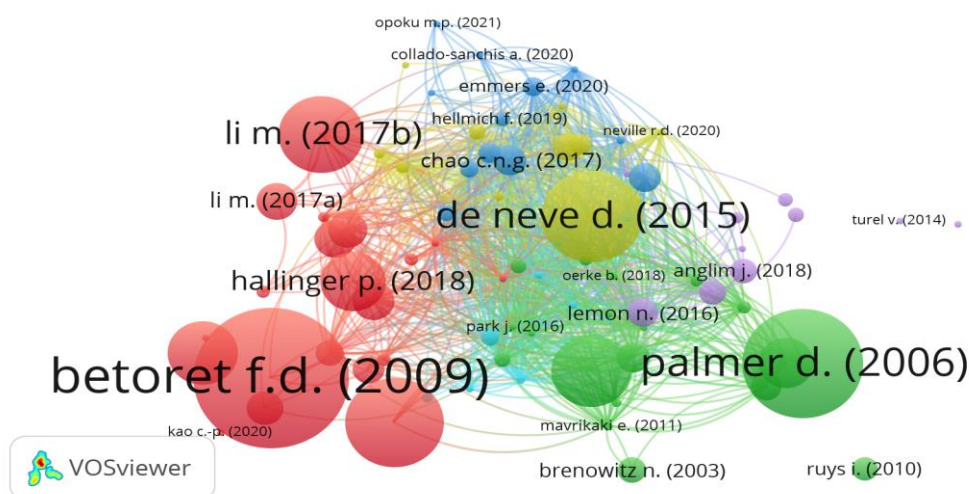


Figure 7. Bibliographic Coupling by Document (Network Visualization)

3.2.4 Co-occurrence Analysis of the Author's Keywords

In this last section, the analysis related to the use of keywords is included in the bibliography of the analysis. In Figure. 8, you can see a map visualization that displays keywords from the most widely used author in a publication. With the criteria of the minimum number of keywords used, it is determined to be 5. From the 443 keywords that appear, there are 17 keywords that meet the category. Of all the keywords, self-efficacy became the most popular keyword, with 69 co-occurrences and a total link strength of 58.

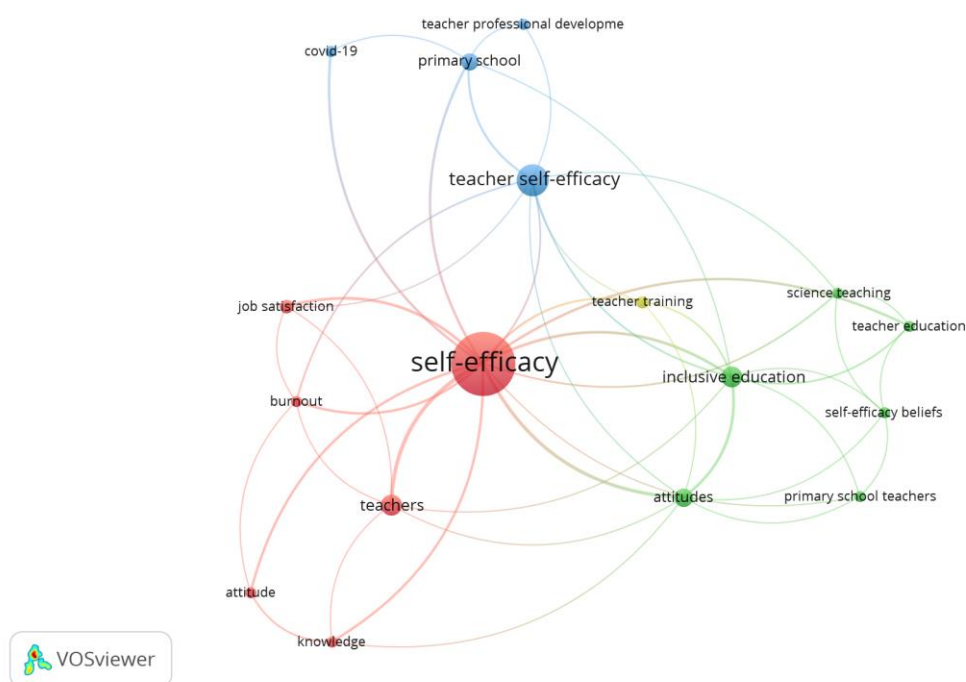


Figure 8. Co-occurrence Analysis of the Author Keywords (Network Visualization)

The second view can be presented in Figure 9 showing a visualization of the number of keywords in the abstract of teacher self-efficacy in elementary schools from year to year. The color shown on the visualization display shows research on teacher self-efficacy in elementary schools in the 2016 to 2019 period. The brighter the color displayed, the more recent the publication. Inclusive education, job satisfaction, COVID-19, professional teacher development, and teacher education are the most used keywords in recent publications.

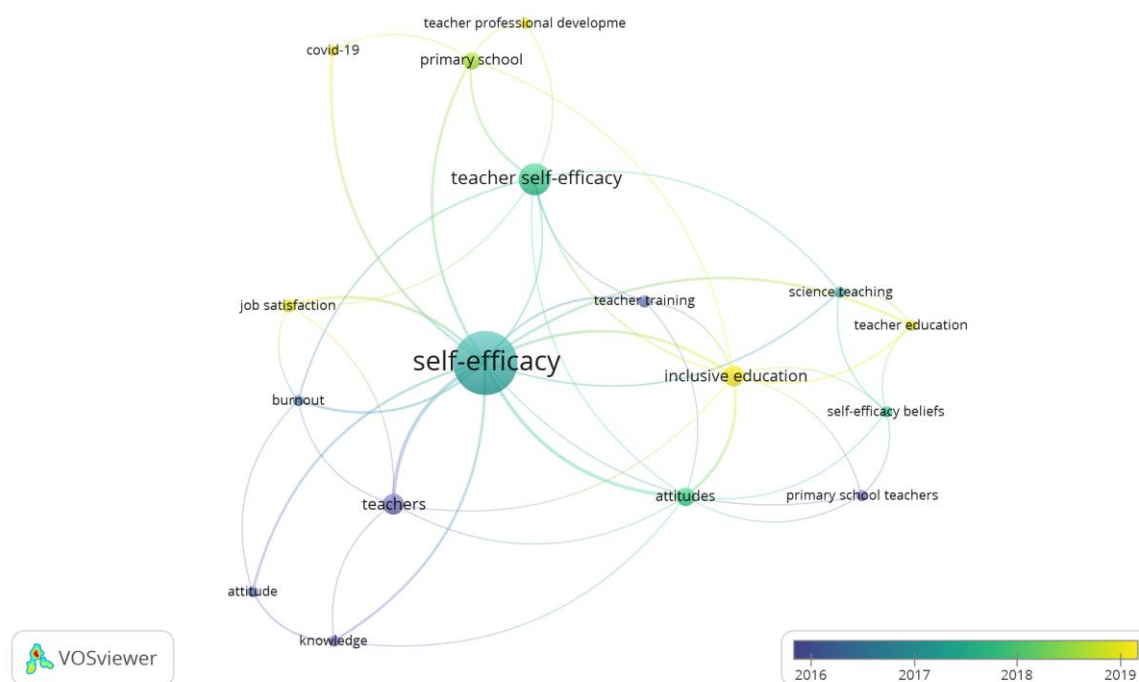


Figure 9. Co-occurrence of the Author Keywords (Overlay Visualization)

3.3 Discussion

This study aims to reveal the analysis of descriptive data in the form of publication year, country, journal, document citation, and the most widely used keywords in publications related to teacher self-efficacy in elementary schools. Bibliometric analysis is used to analyze data in order to identify emerging themes and themes that are rarely used in a field (Palmatier, Houston, & Hulland, 2017). In addition, analysis using bibliometrics can be said to be part of the research evaluation methodology because it uses various kinds of literature that have been published in a certain period of time to be analyzed (Ellegaard & Wallin, 2015; Hanif Batubara et al., 2022).

The results of this study will be very useful because they reveal the current field conditions. This study used bibliometric analysis to analyze the appropriate replication for teachers' self-efficacy and primary school education. The use of bibliographic analysis is carried out to map the selected topics and avoid personal interpretation and prejudice in presenting transparent and comprehensive data in an increasing research area (Hernández-Torrano, Karabassova, Izenkova, & Courtney, 2021; Jing et al., 2021; Özçinar, 2015).

The findings in Figure 1 show a visualization of publications that continue to increase from year to year from the Scopus database, which is a well-known publisher today. The results obtained revealed that the publications that met the predetermined criteria were published in 1994. During the first 5 years, the research trends did not attract much interest from the researchers. However, in 2011, there was a significant increase in publications. It can be seen that the number of publications has reached more than 30 in recent years. Based on this data, it can be concluded that publications on teacher self-efficacy have increased and have become a developing field. Figures 2 and 3 show the top 10 countries and universities that publish according to the filter results. Through Figure 2 and Figure 3, developed countries are the source of most articles related to teacher self-efficacy. And in Figure 4, article publications (90.2%) occupy the highest position, followed by conference pages, book chapters, reviews, and books.

Furthermore, in the visualization display in Figure 5, a visualization display of the country map that is published according to predetermined criteria is presented. From the results that have been

described, the strongest literature sources are "International Journal of Inclusion" and "Egitim ve Bilim". Based on these results, it can be seen that the sources of information related to teacher self-efficacy research are in accordance with their fields. Researchers send the results that have been obtained from the field for publication in relevant journals. The results of the bibliographic coupling by sources analysis in Figure 6 shows that the majority of educational journals that issue publications are related to each other.

In Figure 7, the bibliographic coupling by document analysis shows that the citation relationship between documents is getting bigger and the colour of the visualization map is thicker, meaning that citations occur between documents. The most cited documents reveal that the management of teacher self-efficacy in the classroom and good teacher instructional self-efficacy as internal factors have an impact that results in lower work stress (Betoret, 2009). Furthermore, teachers with self-efficacy who have cognitive pedagogical mastery are the main sources that make teachers succeed in teaching in the classroom (Palmer, 2006). In line with this, the self-efficacy of teachers who believe in their ability to organize and carry out actions is very influential in completing certain tasks (Bandura, 1977). Teachers who have confidence that teachers are able to carry out and complete their duties well can be said to have good self-efficacy.

Based on the results of the bibliometric analysis in Figures 8 and 9, it can be seen that the author's most frequent keyword that appears in a publication is 'Self-Efficacy'. In addition, there are 'teacher self-efficacy', 'teacher', 'inclusive education', and 'attitudes'. This study shows that several publications focus on teacher self-efficacy. These findings are in line with the fact that inclusive education and self-efficacy beliefs are new research trends (Kilmen, 2022; Woodcock, Sharma, Subban, & Hitches, 2022; Wray, Sharma, & Subban, 2022). If we look at the yellow line visualization map, it means that this research is still rarely studied. Likewise, for keywords that are green. This finding reveals that research related to teacher self-efficacy continues to increase from year to year. The findings in the field of education have identified the potential for teacher self-efficacy in teaching activities (Dilekli & Tezci, 2020).

4. CONCLUSION

This analysis presents the overall structure of the contributing publications and identifies research gaps. In addition, this research can inform readers about sources and documents that can be included in the field of teacher self-efficacy in primary school education. The results of this study indicate that in addition to well-known countries that discuss teacher self-efficacy in primary school education, this study also needs to be carried out in other developing countries. It is suggested that developing countries can develop research in this area and that teacher self-efficacy should be more focused on teacher self-development and teacher confidence when teaching.

Some recommendations based on the findings in this study that the researchers present below:

- This study only uses articles published in the Scopus database, and there are only 164 articles filtered by that, so they are limited. It would be better if, in the future, researchers could add other databases so that more articles are studied.
- This study only discusses teacher self-efficacy and primary school education; it would be more useful if some other variables were added in future study.
- This study only reveals the results of the analysis on year, journal, citation, and keywords, so it would be better if future study discusses a more in-depth analysis of the context of the publication.

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Conflicts of Interest: The authors declare no conflict of interest.

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