



International and Indonesia's Teacher Performance : A Bibliometric Study Based on Vosviewer

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Abstract: This study aims to analyze teacher performance from various perspectives, including a general description of teacher performance publications; trends; country; organization; source; authors, and the relationship between authors; and teacher performance research hotspots, both in international and Indonesian contexts. This study used the literature review method with data analysis using Vosviewer software. Scientific publication data comes from Scopus in 2003-2022 or the last 20 years as many as 393 documents. The findings of this study include the following: the publication of teacher performance in Scopus is still wide open; in the international context, the United States dominates the number of documents, citations, and sources; Indonesia ranks second after the United States even though it loses in the number of citations and links; new hotspots for developing research and publications on teacher performance include: decision support system, covid, attitude, values, authentic leadership, emotional intelligence, educative teacher performance, work discipline, job satisfaction, professional development activity, work motivation, compensation, educational reform, student achievement grade. This study is a source of decision-making for educational organization managers related to teacher performance research and development.

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Introduction

Teachers are the most critical asset of any education system. They transmit knowledge, skills, and values (Kihm et al., 2011). Therefore, every school needs teachers who have excelled in performance. Moreover, teacher performance is vital in achieving school goals (Sunaryo et al., 2020). Performance is the result of work shown both quantitatively and qualitatively. Quantitative performance refers to results or the amount of work measured by numbers such as the number of teaching hours per day, the number of research completed in a year, and so on. In contrast, qualitative performance can be shown by qualities such as excellent or bad produced by the teacher (Ratnasari et al., 2019). Demands for quality education outcomes are increasing. Therefore, educational institutions seek to acquire knowledge and strategies to overcome quality problems by improving teacher performance (Ghaffarian Asl & Osam, 2021). Research results show that high-performing teachers must implement quality education (Johnson et al., 2021; Maritasari et al., 2020; Popovi et al., 2020; Rachmah & Putrawan, 2018).

Teacher performance refers to the teacher's ability to carry out learning activities by continuously improving student achievement and providing guidance to other teachers (Ngabiyanto et al., 2022). Teacher performance is the teacher's action in preparing,

implementing, and evaluating the learning process (Afandi et al., 2021). In carrying out this task, the teacher needs critical abilities and self-reflection to go beyond the administrative limits of education (Trostek, 2020). Teacher performance requires evaluation or performance appraisal through a series of evaluations of the teacher's morality, work attitude, quality of teaching, the quantity of scientific research, and so on (Zheng & Sun, 2022). Through this performance evaluation, teacher performance can be maintained and contribute significantly to language, mathematics, and science learning outcomes (Ishak & Suyatno, 2020). In addition, effective teacher performance can build student interest and motivation, affecting learning outcomes perceived as frightening, such as mathematics (Tambunan et al., 2021). The vital role and influence of teacher performance on education require strategic and systematic efforts to improve and enhance teacher performance (Afandi et al., 2021; Maritasari et al., 2020; Obreque et al., 2019).

Many factors influence high and low teacher performance. Hendrawijaya research (2020) showed that organizational culture, leadership style, work ethic, and commitment positively affect teacher performance. Other studies have found that transformational leadership and job satisfaction positively and significantly affect teacher performance (Tanjung et al., 2020). Principal leadership with a growth mindset influences teacher performance and school performance (Shen et al., 2021). Optimal teacher performance occurs because of support for tenure, teacher certification, and work motivation (Phytanza & Burhaein, 2020). Other factors based on the study's results show that the principal's decision-making, the teacher's organizational commitment, and the school climate positively and significantly affect performance (Mailool et al., 2020). Research by Ortiz-López et al. (2022) found that teacher teaching competence affects teacher performance; Personal characteristics of a teacher have a significant influence on teacher performance (S. S. Wulandari et al., 2021). An inappropriate evaluation system for teachers causes low teacher performance (Musodza et al., 2020), therefore teachers are recommended to be able to do self-reflection in order to be able to improve their professional competence so that it has an impact on their performance (Martínez-Izaguirre et al., 2018).

Teacher performance is essential for the progress of a nation (Mi u et al., 2022; Obreque et al., 2019). Much research on teacher performance and its impact has been carried out and published (Hendrawijaya et al., 2020; Jardilino et al., 2021; Kanya et al., 2021). The publication is recorded in the Scopus and non-Scopus databases. Knowledge and information about teacher performance can help decision-makers who manage educational organizations and researchers in this field. Decision makers can use which aspects of teacher performance need improvement quickly. Researchers can use this information about hotspots to be continued teacher performance research. However, no study has been found on teacher performance using in-depth and comprehensive bibliographic analysis. This research contains a novelty in the form of an in-depth and comprehensive bibliographic analysis using Vosviewer software.

This study aims to analyze teacher performance from various perspectives, including a general description of teacher performance publications; trends; country; organization; source; authors, and the relationship between authors; and teacher performance research hotspots, both in international and Indonesian contexts. Concerning these objectives, this research makes the following research questions (Q): Q1: What are the general trends in teacher performance research publications?; Q2: Which country has the most publications on teacher performance?; Q3: Which research organizations have a significant influence on teacher performance?; Q4: Which author is the most productive in teacher performance, and

what is the level of cooperation between the authors?; Q5: What is the description of teacher performance research hotspots in the future?.

Research Method

This study used the literature review method with data analysis using Vosviewer software (Dubyna et al., 2022; Finandhita et al., 2022; Oyewola & Dada, 2022). With this software, the researcher describes the publication's general description, the authors' connectedness, institutional cooperation, co-occurrence, keywords, and hotspot evolutionary paths on the theme studied (Ageel, 2022; Oyewola & Dada, 2022; Putri et al., 2021). Scientific publication data comes from the Scopus database from 2003 – 2022 or the last 20 years. The number of documents analyzed was 393 documents.

Search for document data from the Scopus database as follows: title ("teacher perform*"), limit publications from 2022 to 2003 and limit again to English articles. This search method produces 393 documents. This number is then used in bibliographical analysis using Vosviewer software. Vosviewer is a helpful software tool for creating and visualizing bibliometric networks (Huang et al., 2022; Kurniati et al., 2022; Luckyardi et al., 2022). The network includes journals, researchers, institutions, and even countries. Networks in VOSviewer can be built based on citations, bibliographic coupling, co-citations, or co-authorship links (Nurdin et al., 2021; van Eck & Waltman, 2017). VOSviewer also offers text mining functionality (hotspots) which can be used to build and visualize co-occurrence networks of critical terms extracted from bodies of scientific literature (Y. Wang et al., 2022; Yang et al., 2022; Zhang et al., 2022). Various publication themes of bibliography analysis use Vosviewer, but there is nothing specific about teacher performance.

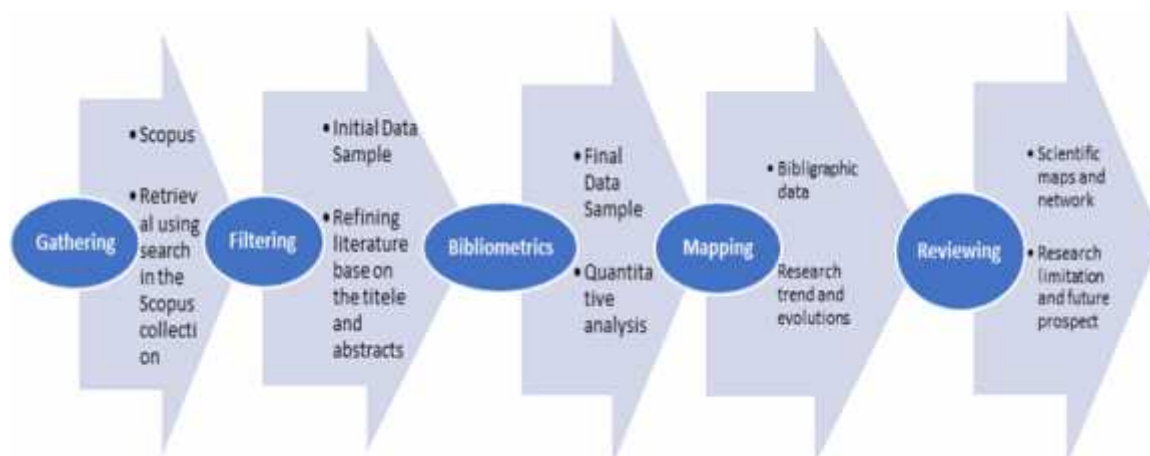


Figure 1. The Stages of Bibliographical Analysis Using Vosviewer

Results and Discussion

Searching documents from the Scopus database on titles, articles, and abstracts using the keyword "teacher perform*" found 502 documents. To make the analysis more focused and more manageable, the researcher then continued searching the Scopus database for the title of the article using the keyword "teacher perform*" in English, and the year of publication was limited to 2003-2022 or the last 20 years. This search found a total of 393 documents. Finally, the author uses that number to analyze the bibliography teacher performance using Vosviewer software.

Bibliographical studies cannot be separated from the year and publication trend. In this study, the researchers ranked the five most productive years of publications on teacher

performance. 2020 is ranked first or the most productive year with 66 documents. In 2022 and 2021, each with 44 records is ranked second, and in 2019 with 42 documents, it is ranked third. In 2017, with 112 documents, it was ranked fourth; in 2015, it was ranked 5th, with 27 documents (Figure 2). Based on these data, publications about teachers' performance at the Scopus indexing agency are classified as sufficient or not extensive. This situation is indicated by the data on the number of publications of teacher performance documents in 20 years which are, on average, 19 articles per year. This figure is relatively small in the international context.

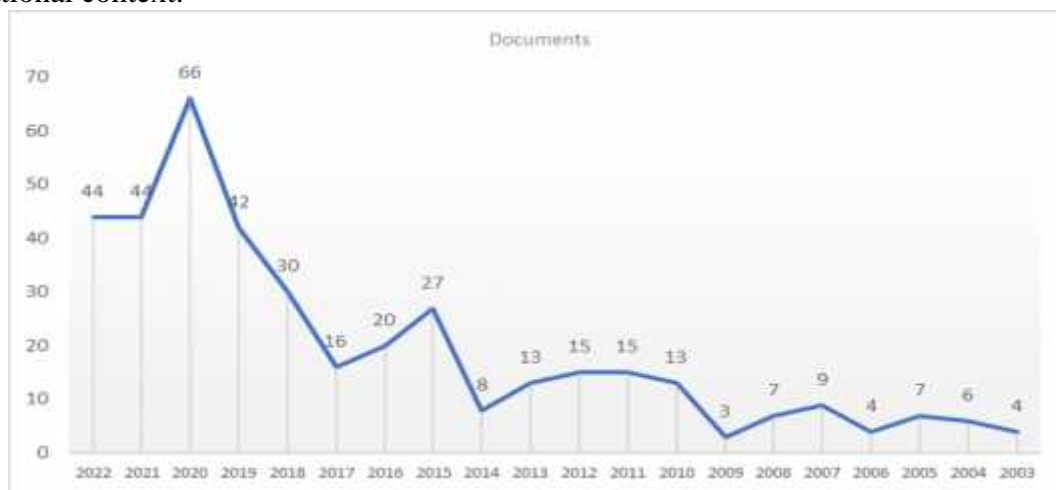


Figure 2 . 20 Years of Teachers Performance Publication Trend

The bibliography study focuses on which countries publish scientific articles on that theme. Based on the minimum criteria of 5 publications, the United States issued most reports on teacher performance with 104 documents. They were then followed by Indonesia (99 documents), China (31 documents), the United Kingdom (15 documents), Australia and Turkey (13 documents), and Malaysia (11 documents). Based on these data, the United States dominates the publication of teacher performance themes. In Southeast Asia, Indonesia and Malaysia are the most significant contributors to teacher performance publication documents. Indonesia and Malaysia contributed 99 and 11 documents, respectively. Indonesia is the most productive country in the Southeast Asia region.

Regarding citations, teacher performance documents from the United States were cited the most (2193 citations, eight links), ranking first of all countries and followed by Indonesia (355 citations, 4 links) and the United Kingdom (184 documents, 6 links). Based on this data, the quantitative number of published documents is not always linear with link strength. China and the United Kingdom, which have fewer publication documents on teacher performance than Indonesia, have more links.

Table 1. Distribution of Teacher Performance Publications in Various Countries

No.	Country	Document	Citations	Link
1	United States	104	2193	8
2	China	31	94	6
3	United Kingdom	15	184	6
4	Indonesia	99	355	4
5	Australia	13	97	3
6	Malaysia	11	61	3
7	Canada	8	84	2
8	Chile	7	100	2
9	Germany	6	136	1

10	Saudi Arabia	5	1	1
11	Turkey	13	72	0
12	India	10	56	0
13	Israel	6	77	0
14	Mexico	5	32	0
15	Peru	6	10	0
16	Philippines	7	51	0
17	Spain	5	25	0

In the regional context, the theme of teacher performance in Indonesia is relatively new. This can be seen in Figure 2 of the Vosviewer mapping results. Based on Figure 2, Indonesia's position is yellow. This means that the theme of teacher performance appears in the 2020s. Yellow is also seen in Sweden, Ethiopia, Lebanon, and Peru. This situation is challenging for regional researchers to make the teacher performance theme an alternative research and publication theme. Furthermore, suppose you look at the relationship between teacher performance researchers based on Figure 3. In that case, it can be seen that Indonesian researchers are connected with researchers in the United States, Malaysia, Thailand, Japan, and Palestine. This is a challenge for Indonesian researchers to connect more with researchers from other parts of the world.

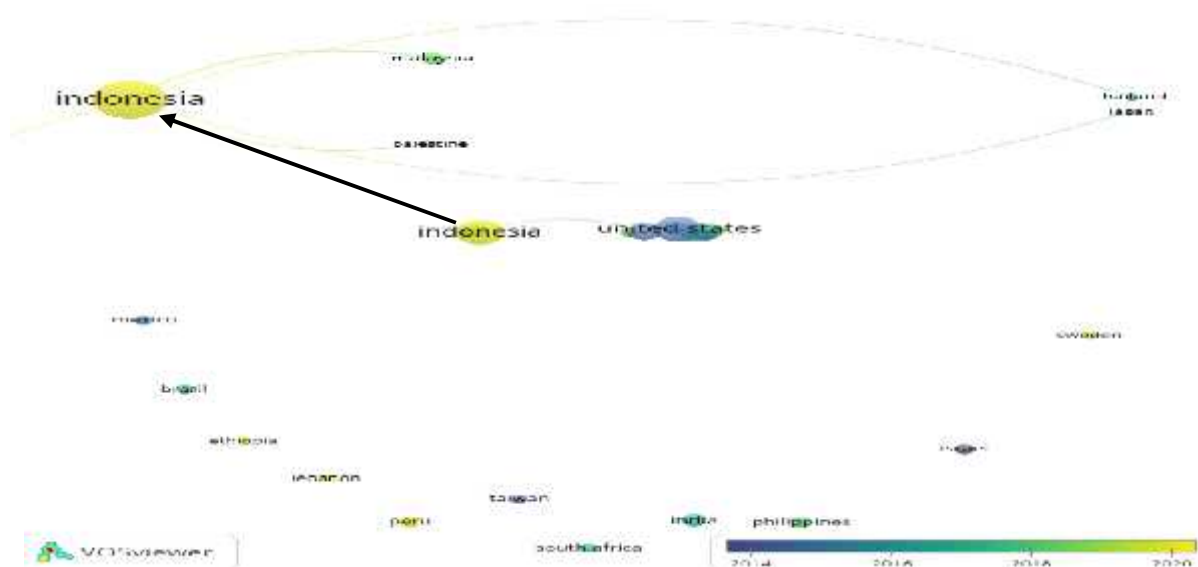


Figure 3. Indonesia in Teacher Performance Publications

The bibliographical study pays attention to which institution/organization or university the article's publication originates from. With the minimum criteria of 3 documents from organizations or universities, this study found nine institutions. The most productive institution in publishing teacher performance is Universitas Negeri Semarang, Indonesia (5 publications, 1 citation). Pelita Harapan University, Indonesia (4 documents, 58 citations) and Sekolah Tinggi Ilmu Hukum Pengayoman, Makasar, Indonesia (4 documents, 0 citations) rank second in terms of productivity. Other institutions publish three and below 3. Although the most productive, this university lost in citations to Brigham Young University, United States (5 documents, 29 citations). Even though Universitas Negeri Semarang, Indonesia, is the most productive, from a citation perspective, it is lost to an institution/organization or university in the United States (3 documents, 157 citations). From a link perspective, Universitas Negeri Semarang, Indonesia, also lost to IAIN Salatiga, Indonesia; Management Department, Binus Online Learning, Bina Nusantara University, Indonesia; and Pelita

Harapan University, Indonesia. Based on this data, educational institutions in Indonesia dominate publications about teacher performance.

Table 2. Teacher Performance Publication Institutions

No.	Organizations	Document	Citations	Link
1	IAIN Salatiga, Indonesia	3	48	6
2	Management Department, Binus Online Learning, Bina Nusantara University, Indonesia	3	48	6
3	Pelita Harapan University, Indonesia	4	58	6
4	Sekolah Tinggi Ilmu Ekonomi Amkop, Makasar, Indonesia	3	0	4
5	Sekolah Tinggi Ilmu Hukum Pengayoman, Makasar, Indonesia	4	0	4
6	Universitas Negeri Makasar, Makasar Indonesia	3	5	2
7	American Institute For Research, United States	3	157	0
8	Universitas Negeri Semarang, Indonesia	5	1	0
9	University of Southern California, United States	3	5	0

Bibliography studies emphasize information about the journal or source from which the article originates. For example, based on Table 3, in the last 20 years, nine journals have published a minimum of 5 documents on teacher performance. The names of these sources are the International Journal of Scientific and Technology Research (13 documents), Journal of Physics Conference Series (12 documents), International Journal of Innovation, Creativity and Change (10 documents), and Economic of Education Review (10 documents). Although the International Journal of Scientific and Technology Research published more teacher performance documents, they lost out in citations by the Economic of Education Review (7 documents, 164 citations) and Educational Evaluation and Policy Analysis (5 documents, 132 citations).

Table 3. Teacher Performance Publication Sources

No.	Sources	Document	Citations	Link
1	Economic of Education Review	7	164	89
2	Educational Evaluation and Policy Analysis	5	132	89
3	Education Policy Analysis Archive	6	69	23
4	Universal Journal of Education Research	6	23	15
5	International Journal of Innovation, Creativity, and Change	10	12	11
6	International Journal of Scientific and Technology Research	13	90	10
7	Systematic Review in Pharmacy	5	59	7
8	Journal of Physics Conference Series	12	17	3
9	Proceedings of the International Conference on Industrial Engineering and Operations	5	0	1

In the context of the relationship between journals that have published teacher performance in the last 20 years, with the help of mapping by Vosviewer, we can see the oldest and newest journals in the publication of this theme. In Figure 4, the yellow journal indicates a more recent year in publishing teacher performance. For example, International Journal of Innovation, Creativity, and Change, Planning Continuing Profession, Economic Development and Culture, Decision Support System, Humanities, and Social Science. In contrast, the blue journal is the oldest teacher performance publication—examples: Economic

of Education Review, Educational Evaluation and Policy Analysis, Applied Mathematics, and Information Science. If you use the average criterion of 5 documents in one source, then only nine journals have links between journals in this theme (See Table 3). The nine sources with the strongest connection are Economic of Education Review and Educational Evaluation and Policy Analysis, each of which has 89 links. Other sources have links under 23 links.

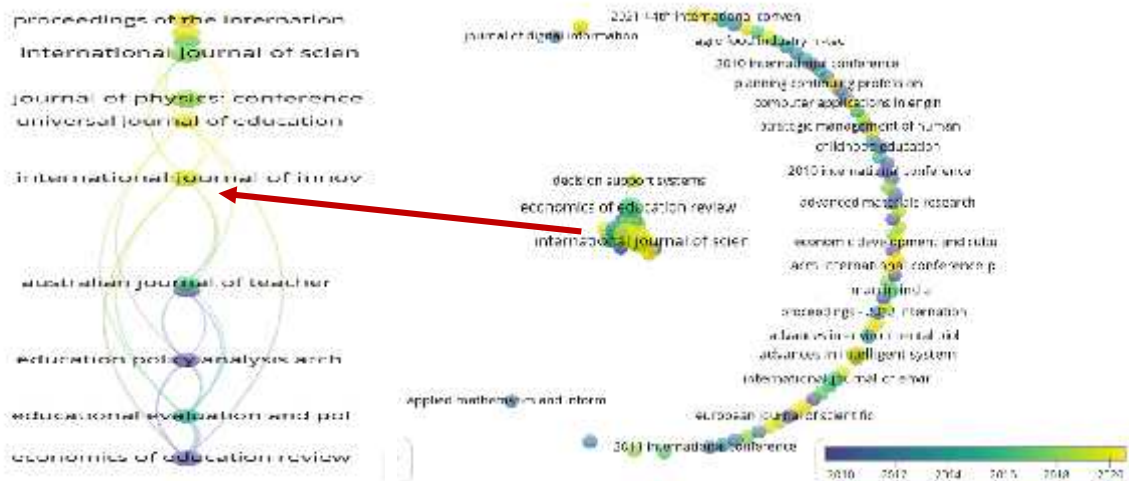


Figure 4. Source of Publication on Teacher Performance

Bibliography studies also question who the authors are in the theme being studied. In an international context, based on the category of at least three authors of documents on teacher performance, this study found 11 authors. Among 11 authors, there is one author in the most productive category. If other writers average 3, then he wrote five articles and the most citations. His most prolific is Springer M.G (5 documents, 267 citations), but his respective links are blank. Meanwhile, other authors have three documents with 136 citations each and six links each, namely Guarino C.M., Reckase M.D., and Wooldridge J.M.

Table 4 Co-Authors Teacher Performance

No	Author	Documents	Citations	Link
1	Guarino C.M.	3	136	6
2	Reckase M.D.	3	136	6
3	Wooldridge J.M	3	136	6
4	Goldhaber D.	3	98	0
5	Milanowski A.	3	89	0
6	Namaditya B.S.	3	4	0
7	Purwanto A.	3	45	0
8	Ragusa G.	3	5	0
9	Springer M.G.	5	267	0
10	Steinberg M.P.	3	115	0
11	Taylor E.S.	3	202	0

From the context of teacher performance authors, we can classify them based on the age of the publication and its network. We organize the publication age into old, middle, and young or new groups. Based on this classification (see Figure 5, yellow indicates young, and blue indicates old/senior). Based on Figure 4, Purwanto A., Namaditya B.S., and Steinberg M.P. are young or new authors. Meanwhile, Reckase M.D., Wooldridge J.M., and Guarino C.M. are old or old writers. Other authors have cited many old/old authors, and they network with others. Something is interesting from Figure 5: Purwanto A., --classified as a new author--is

affiliated with an Institute in Indonesia that has a network with many other writers, especially in Indonesia.

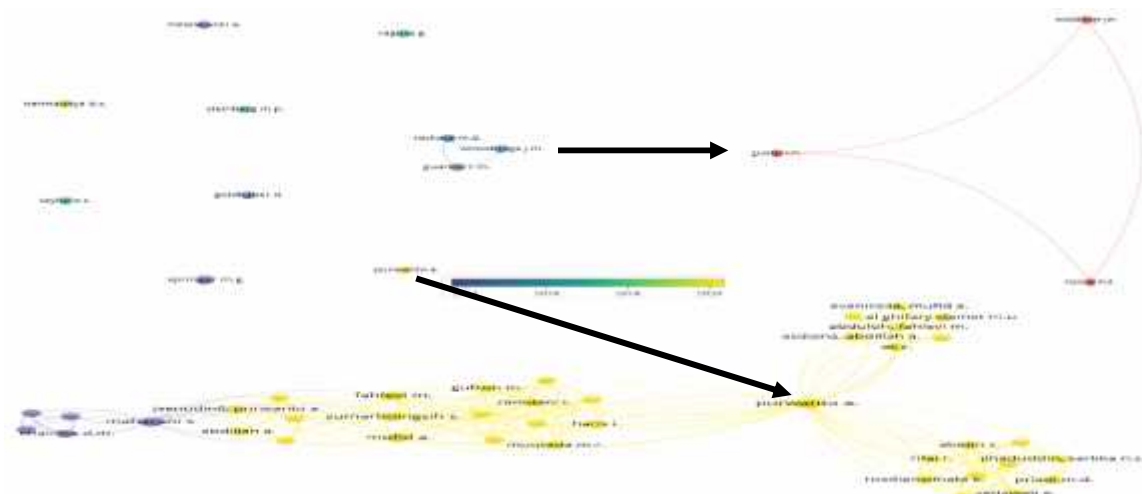


Figure 5. Relationship between Authors of Teacher performance

The constructed text data map on Vosviewer can show teacher performance hotspots. If the analysis is based on text data based on the article's title, which appears at least five times, then the theme of teacher performance is connected with 24 words/phrases. The twenty-four words/phrases are divided into six clusters. The first cluster contains items: covid, development, research, work, teacher performance evaluation, and work motivation. The second cluster includes items: case study, high-stakes teacher performance, implication, teacher performance appraisal, and teaching. The third cluster contains items: assessment, education, teacher, and teacher performance assessment. The fourth cluster contains items: design, implementation, performance, and student achievement. The fifth cluster contains items: attitude, role, and teacher performance. Finally, the sixth cluster has evidence and teacher performance pay. Suppose the construction map on Vosviewer uses Overlay Visualization (pay attention to the yellow color and year). In that case, the new items/phrases in the context of teacher performance publications are a *decision support system*, *covid*, *attitude*, *value*, *authentic leadership*, *emotional intelligence*, and *educative teacher performance*. (See Figure 6).

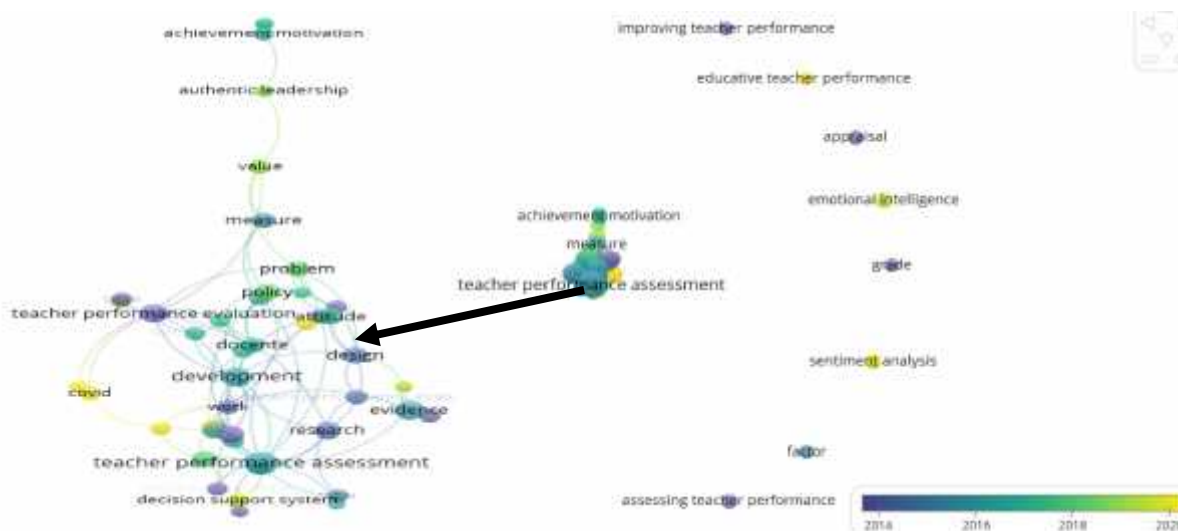


Figure 6. Word Map on Teacher Performance Article Titles

If based on the map of words/phrases in the abstract with the minimum criteria appearing ten times, then the theme of teacher performance is connected with 134 words/phrases. The 134 words/phrases are associated with 4 clusters. These clusters show a difference in focus in teacher performance publications. If you use Overlay Visualization on Vosviewer, the 134 items can be included in old and new items/phrases in the context of teacher performance publications. Words/phrases that have long been associated with teacher performance (Figure 7, see the year and dark blue color) such as process, assessment, evaluation, program, and feedback. The words/phrases are relatively new and are related to teacher performance publications (Figure 8, blue color), such as *work discipline*, *job satisfaction*, *professional development activity*, *work motivation*, *compensation*, *educational reform*, and *student achievement grade*.

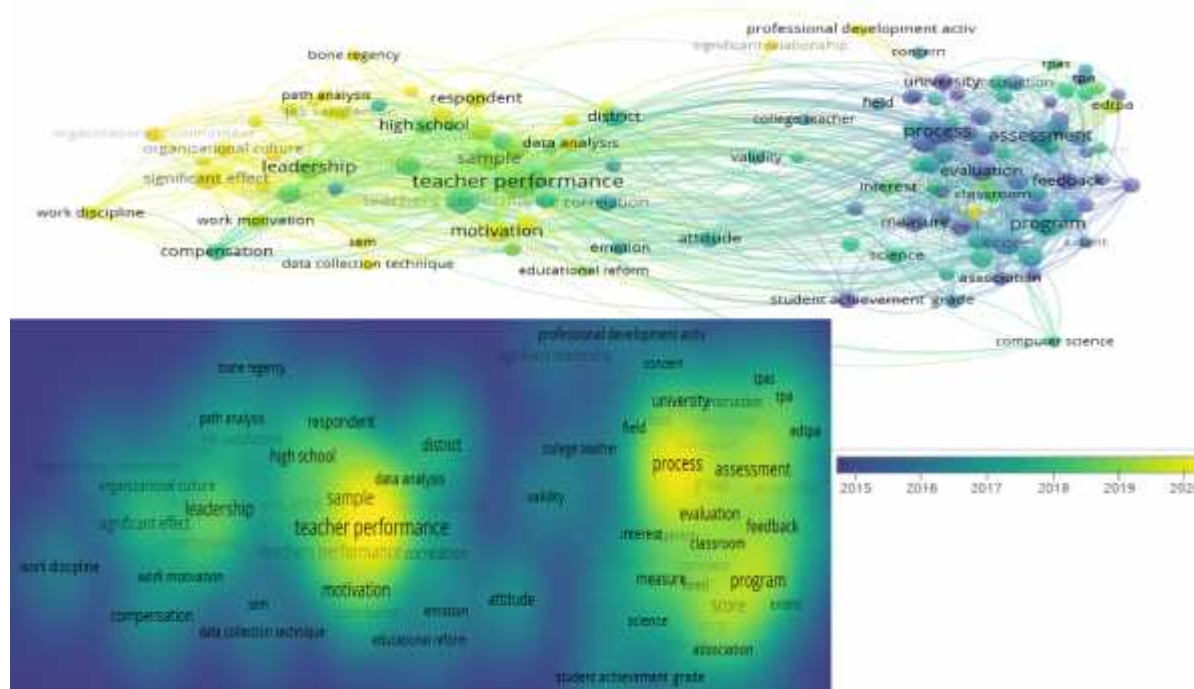


Figure 7. Words Map on Teacher Performance Article Abstracts

Discussion

Based on the bibliographic analysis in this teacher performance study, there are several important things to discuss. These crucial findings include Research trends and interests, the context of teacher performance publications on the international and Indonesian levels, author profiles and sources, and the context of hotspots on teacher performance. Following are some exciting findings from this research. Regarding trends and interest in publications, the theme of teacher performance at the Scopus indexing agency has received attention. However, in the author's opinion, it is still reasonably sufficient or even small. Compared to the number of countries in the world which number in the hundreds, the publication of teacher performance in 20 years averages 19 articles per year. Even though this theme is central because teacher performance is related to the level of quality of education in a country (Junio-Sabio & Manalo, 2020; Padillo et al., 2021; Tambunan et al., 2021), teacher performance requires serious attention. Sharing information about teacher performance from various sides will make it easier to improve teacher performance (Kaswi et al., 2021). Researchers need to arouse their interest in publishing teacher performance, especially in



countries where this theme is not yet saturated. By improving teacher performance, we can improve human resources together (Kolman, 2022; Tambunan et al., 2021) in the context of each country.

Teacher performance publications in an international context show that the United States dominates publications on this theme, including other themes such as food safety (Cheng et al., 2021), green enterprise (N. Wang et al., 2021), and agricultural pollution (Xin et al., 2020). Regarding teacher performance, the United States dominates in the number of published documents, citations, and sources/journals. In terms of the dominance of this publication source, other countries need to learn a lot about how to manage and publish teacher performance so that it can exist in an internationally reputable journal database (Hattoy et al., 2015; Petridis et al., 2013). Indonesia has the second-largest number of teacher performance documents and citations after the United States and the largest for the Southeast Asian region. This shows that this theme interests researchers in Indonesia (Chandra et al., 2020; Hendrawijaya, 2020). This cannot be separated from the context of Indonesia, which wants to become a developed country so that the education sector is expected to contribute optimally (Setiawan & Suwandi, 2022; W. Wulandari et al., 2020). Only through education can the progress of a country be achieved properly (Benešová & Tupa, 2017). Therefore, this research also shows that many organizations or universities in Indonesia have contributed to publications on this theme.

Findings related to organizations or universities that publish teacher performance articles. Based on the minimum publication criteria of 3 documents, this study found that many educational institutions from Indonesia were productive in publishing teacher performance themes. Such as Universitas Negeri Semarang, Indonesia; Pelita Harapan University, Indonesia; and Sekolah Tinggi Ilmu Hukum Pengayoman, Makasar, Indonesia. Even though they are the most effective, universities in Indonesia lose out on the number of citations and links to universities in the United States. Based on these facts, any country should make an effort so that its intellectual works can be followed up with collaboration (Abbas et al., 2022; Hargreaves, 2019; Nordgren et al., 2021) and communication with other researchers in various countries (Hammad & Al-Ani, 2021).

There are old and young or new writers from the context of the age of authorship on teacher performance. For example, Purwanto A., Namaditya B.S., and Steinberg M.P. are young or new authors. Meanwhile, Reckase M.D., Wooldridge J.M., and Guarino C.M. are old or old authors. In addition, other authors have cited many old/old authors, and they network with other authors (Hartinah et al., 2020; Ratnasari et al., 2019; Sopiah et al., 2021). The last exciting finding is the hotspot. Based on a study of Vosviewer map construction in analyzing words/phrases in article titles, it was found that the hotspots that had just appeared in the context of teacher performance publications were: *decision support system, covid, attitude, value, authentic leadership, emotional intelligence, educative teacher performance*. While the hotspots of the article abstract include: *work discipline, job satisfaction, professional development activity, work motivation, compensation, educational reform, and student achievement grade*. These new words/phrases can inspire the development of research and publications about teacher performance in the future.

Conclusion

This study concludes that the interest in and the number of publications about teacher performance, especially in the Scopus scientific article database, is still open because there are not many counts. In this research, the United States dominates the number of documents, citations and publication sources in an international or global context. In Southeast Asia,

Indonesia has the second-largest number of documents and teacher performance citations after the United States. Even though they are the most productive, universities and colleges in Indonesia lose out on the number of citations and links to universities and colleges in the United States. This study found that new hotspots for the development of research and publications about teacher performance in the future are: *decision support system, COVID, attitude, value, authentic leadership, emotional intelligence, educative teacher performance, work discipline, job satisfaction, professional development activity, work motivation, compensation, educational reform, student achievement grade*.

Recommendation

Based on these conclusions, this study recommends that decision-makers, especially in the field of Education, pay serious attention to improving and publishing teacher performance. Publication in various publication databases, especially in Scopus, is a challenge. Sharing by researchers from multiple countries is expected to make us all aware of continuing to improve teacher performance in their respective countries. Meanwhile, the recommendation for researchers is to continue to increase teacher leadership publications through undeveloped hotspots such as those in this study, including: *decision support system, COVID, authentic leadership, emotional intelligence, work discipline, and job satisfaction*.

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