

Mapping research on Indonesian professional teacher: The bibliometric analysis

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ARTICLE INFO

Article history

Received: December 7, 2023

Revised: December 21, 2023

Accepted: December 29, 2023

Keywords

Teacher competence

Teacher professionalism

Teacher education

Professional development

ABSTRACT

This research aims to identify trends in scientific publications with the theme of Indonesian professional teachers. The research uses bibliometric analysis involving scientific publications from 1982 to 2023 in the Scopus database. The keyword we use is a professional teacher in Indonesia. The analysis results show that the trend of scientific publications with the keyword professional teacher in Indonesia has experienced a significant increase, with the peak occurring in 2020-2023. Indonesia is the country that has the highest contribution to scientific publications about Indonesian professional teacher. Wiyono, B.B. is a well-known researcher who has the most publications, while Lie, A. is a researcher who has the most total citations. Most scientific publications are in conference series, specifically in the Journal of Physics: Conference Series. The research results open up opportunities to conduct further research in areas that have not been widely researched, such as online learning communities, pedagogical content knowledge, professional development programs, professional knowledge, professional training, STEM (Science, Technology, Engineering, and Mathematics), teacher learning, and teaching practicum. The research results have implications for efforts to professionalize teachers in Indonesia.

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1. Introduction

Teachers are recognized as professionals who are specifically tasked with preparing future generations. Professional teachers play an important role in student achievements, especially cognitive abilities (Akiba & Liang, 2016; Gerritsen et al., 2017; Meissel et al., 2016). Apart from that, professional teachers also play a role in developing positive character in school students (Blazar & Kraft, 2017; Egalite & Kisida, 2018; Gershenson, 2016). Academic and non-academic abilities have been empirically proven to trigger student success in the future (Alyahyan & Düşteğör, 2020). Occasionally, teachers act as second parents when their parents hand them over to school. Thus, the competence of professional teachers needs to be reviewed and improved to play a maximum role in student development (Arikunto et al., 2023).

Professional teachers are an urgent figure in achieving educational success internationally, including in Indonesia. They are categorized as a professional teacher if he has professional, pedagogic, social and personality competencies (Rusilowati & Wahyudi, 2020). In Indonesia, teacher professionalism is supported by professional teacher education. The research results show that not all teachers who hold professional degrees can be categorized as true professionals. As important information, only teachers with a professional degree in education can demonstrate true

professionalism (Aminbeidokhti et al., 2022; Shukla et al., 2018). Teacher professionalism has been proven to impact the quality of learning provided (Doğan & Yurtseven, 2018; Pedaste et al., 2019). As a developing country, Indonesia needs the role and function of professional teachers to prepare the nation's next generation.

Current developments also correlate with additional competencies as a professional teacher. Educational goals can be achieved by improving the skills of 21st-century teachers (Kim et al., 2019; Malik, 2018). As time goes by, professional teachers must be creative in designing meaningful learning for students (Kettler et al., 2018; Patston et al., 2018; Tran et al., 2017). 21st-century teachers are encouraged to use modern technology creatively (Henriksen et al., 2016, 2018; Yilmaz, 2021). Examples of contemporary technology are artificial intelligence (Chen et al., 2020; Hopcan et al., 2022; Tan et al., 2022; Xia et al., 2023), augmented reality (Sirakaya & Alsancak Sirakaya, 2018), and virtual reality (Hu-Au & Lee, 2017; Noben et al., 2019; van der Kruk et al., 2022).

Indonesian professional teacher have been an exciting research theme to uncover until now. This research aims to identify the research roadmap that has been ongoing to date. Research roadmaps are essential to help provide direction for future research (Boschma & Fornahl, 2011; Colby & Len, 2016; Daoutidis et al., 2018). The presentation of research results can explain the research themes carried out from the beginning to the present, along with the parties who contributed to research on the theme of Indonesian professional teacher. Specifically, this research describes (1) countries and institutions that contribute significantly to publications about Indonesian professional teacher; (2) journals that publish articles related to Indonesian professional teacher; (3) themes that often appear in publications about Indonesian professional teacher; and (4) data from leading researchers who have contributed significantly to professional teacher publications in Indonesia.

2. Method

2.1. Research design

Bibliometric analysis is used in this research to analyze data in the form of articles published in scientific journals. This research describes patterns, trends, and metadata of scientific publications about Indonesian professional teacher. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) model was used in this research (Moher et al., 2009; Page et al., 2021) to describe the process of identifying, selecting, and filtering articles published in scientific journals.

2.2. Participants

Search for articles in Scopus-indexed journals with the theme of Indonesian professional teacher from 1981 to 2023. We use the keywords professional teachers in Indonesia to determine articles that suit the research objectives. Articles published in Scopus-indexed journals are selected because they go through a strict review process to be considered suitable for publication. Scopus also displays metadata such as author, institution, and country-level analysis, co-citation analysis, and research network mapping.

2.3. Data extraction

This research only involves articles that have gone through a peer review process. Articles that did not go through the peer review process were decided not to be used in this research. The criteria for an article to be included in the peer review category are if it has gone through a process of correspondence from the editor, proof of article review, brief communication between the author and editor, and a conference paper. A total of 464 articles were independently selected for bibliometric analysis.

2.4. Research procedure

This research includes several procedures that have been carried out. First, we determine the research theme to be analyzed. The research theme determined is Indonesian professional teacher. Next, we chose Scopus as a database to select articles that could answer the research objectives. We use the keywords professional teachers in Indonesia. After we have selected the articles that have gone through the peer review process, the next step is to export them to Microsoft Excel for analysis using the VOSViewer application.

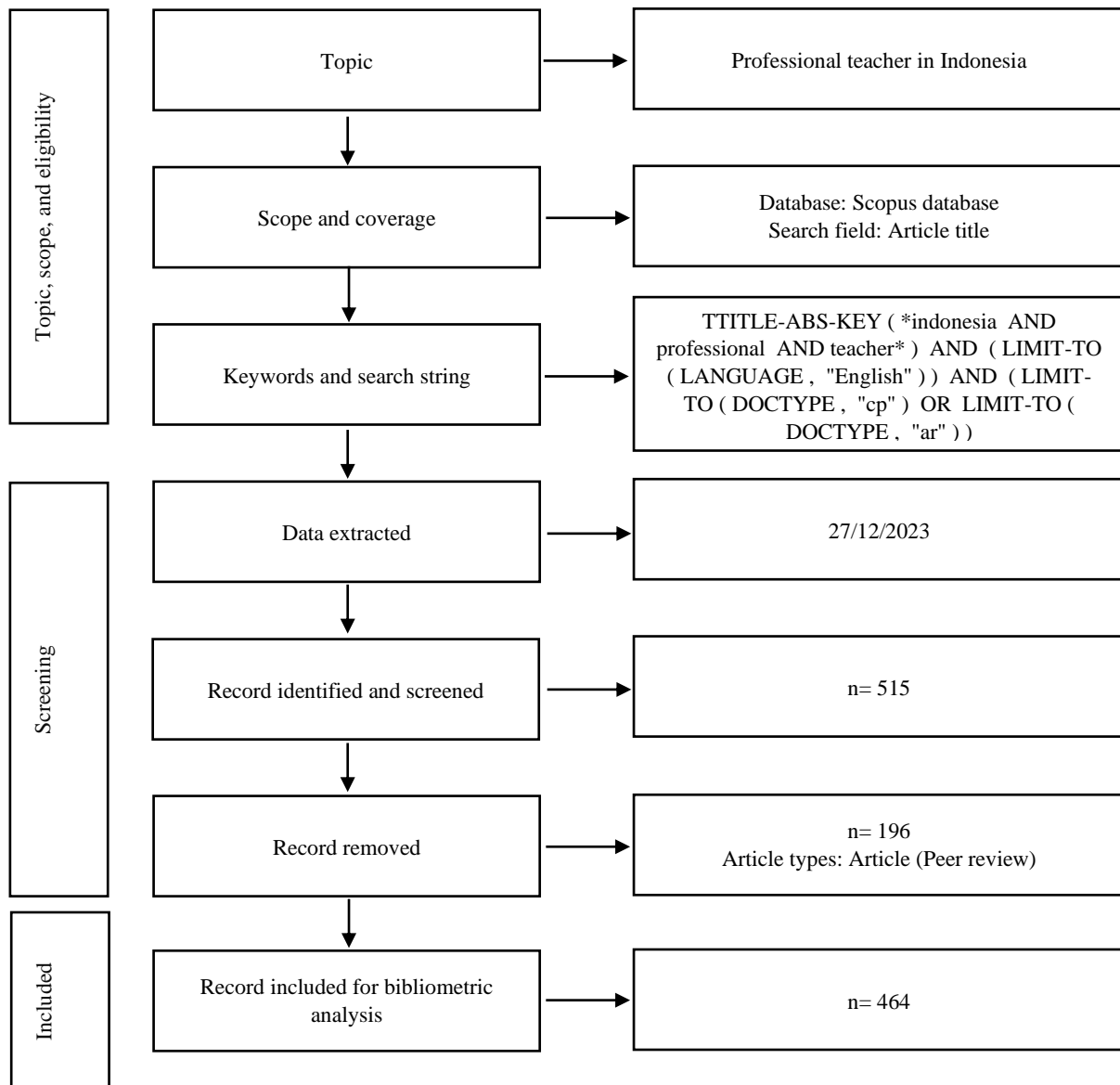


Fig. 1. PRISMA diagram on Indonesian teacher professional publication

2.5. Data analysis

Bibliometric analysis in this research uses the VOSViewer application version 1.6.16. The analysis results from this application can provide interpretations of bibliometric maps presented in the form of images, tables and graphs. Data captured in Scopus-indexed journals is exported into Microsoft Excel. Next, the Microsoft Excel data is used to create visualizations using VOSViewer.

3. Results and Discussion

Professional teachers are an urgent need in Indonesia. Through various studies, researchers have uncovered several facts about Indonesian professional teacher. Researchers' awareness of the importance of Indonesian professional teacher has triggered an increase in the publication of scientific articles published in scientific journals. Figure 2 was obtained from the Scopus database, which depicts the number of publications by Indonesian professional teacher from year to year. Publications regarding Indonesian professional teacher began in 1982. In the 2020s, the number of publications regarding Indonesian professional teacher started to show a significant increase, and the peak occurred in 2020-2023, with the number of publications reaching 58 to 77 articles per year.

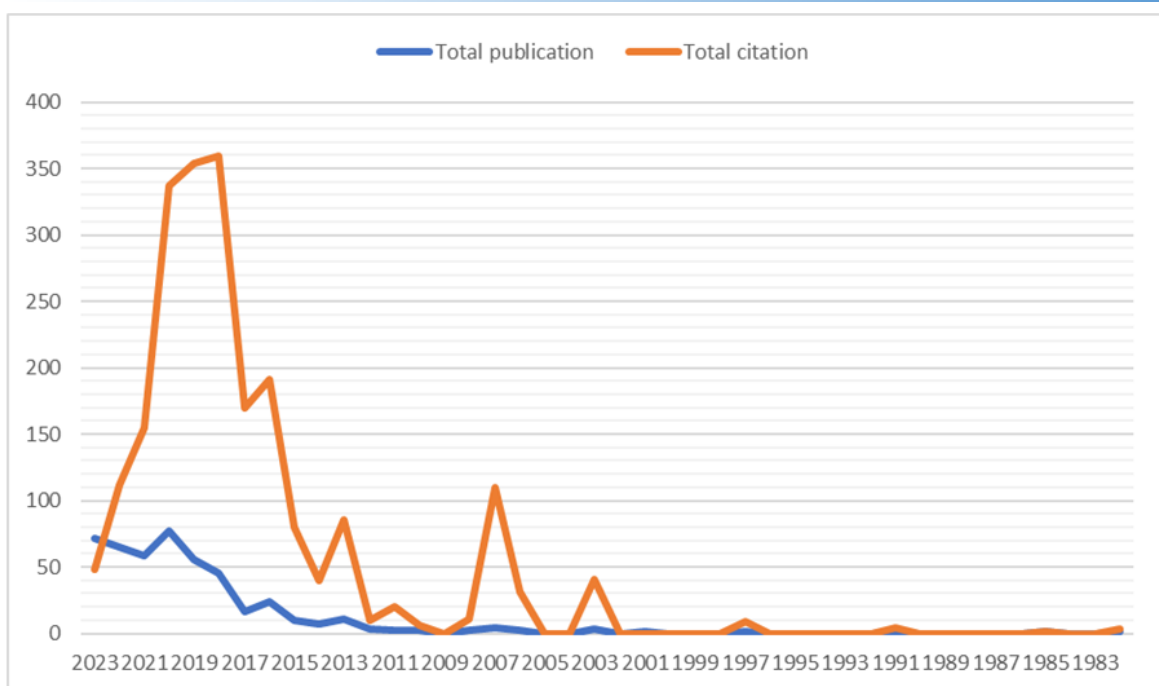


Fig. 2. Published data from 1982 to 2023 with the number of documents

Several countries have a role in publishing articles in Scopus-indexed journals with the theme of Indonesian professional teacher. Table 1 presents a list of the ten best countries to publish articles in Scopus-indexed journals with the theme of Indonesian professional teacher. Apart from that, table 1 also presents the total citations from publications about Indonesian professional teacher.

Table 1. The top ten countries in publication and citation about professional teachers in Indonesia

No	Country	Total Publication	Total Citation
1	Indonesia	398	1644
2	Australia	49	433
3	Malaysia	25	96
4	United States	15	235
5	United Kingdom	14	85
6	New Zealand	9	49
7	Japan	8	68
8	Thailand	8	30
9	Singapore	7	67
10	Netherlands	6	28

Table 1 shows that Indonesia is the country that contributes most to publishing articles in Scopus-indexed journals on the theme of Indonesian professional teacher. Even though the first publication was relatively recent, in 2001 to be precise, Indonesia became the country that contributed the most to scientific publications about Indonesian professional teacher. This publication raised the theme of empowering teacher creativity to lead to positive school change (Raka, 2001). The latest research focuses on adapting and validating a teacher professional competency instrument called HELAM (Handayani et al., 2023). Meanwhile, of all publications in Indonesia, articles on the theme of teachers implementing differentiated learning are classified as having the most decisive influence, because they were quoted the most, 122 times (Suprayogi et al., 2017).

Next, we present a map of collaboration between countries to publish articles on the theme of professional teachers in Indonesia. Figure 2 shows a map of cooperation between countries with Indonesia as the center for publications on the theme of Indonesian professional teacher. This proves that Indonesia has a serious mission to conduct research in the field of experienced teachers. The results of the research are the basis for creating teacher professionalism policies.

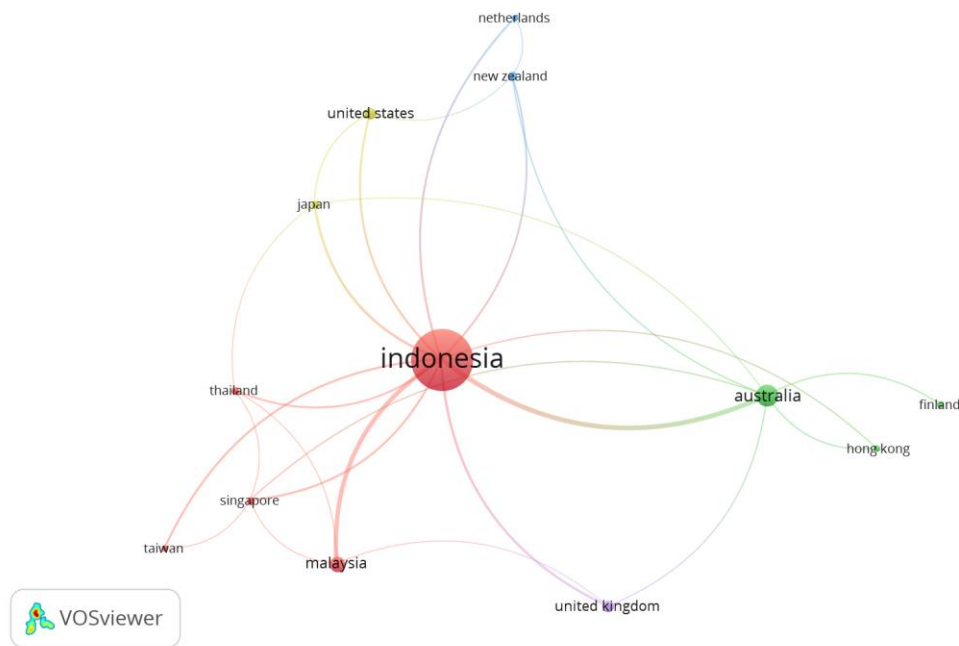


Fig. 3. Co-authorship network of the countries with the highest contributions

The analysis results show that there are at least five clusters. Of the five clusters, Indonesia is the country that collaborates the most with other countries to publish articles on the theme of professional teachers in Indonesia. The countries that are Indonesian collaborators are the Netherlands, New Zealand, Australia, Finland, Hong Kong, United Kingdom, Malaysia, Singapore, Taiwan, Thailand, and Japan. Indonesia carries out collaboration to advance and improve professional teachers in the country (Cirocki & Farrell, 2019; Purnamasari, 2019).

As the first country, Indonesia has several affiliates which also play a role in the publication of Indonesian professional teachers. These affiliates contribute to various research whose main aim is the development of teacher professionalism. Table 2 describes the role of affiliates in conducting research in the field of Indonesian professional teachers. The Indonesian Education University is the affiliate that contributes most to publishing Indonesian experienced teachers.

Table 2. The top ten affiliations in Indonesian professional teacher publication

No	Source	Documents
1	Universitas Pendidikan Indonesia	50
2	Universitas Negeri Yogyakarta	43
3	Universitas Negeri Malang	39
4	Universitas Syiah Kuala	17
5	Universitas Negeri Jakarta	17
6	Universitas Negeri Semarang	16
7	Universitas Negeri Surabaya	16
8	Universitas Sebelas Maret	14
9	Universitas Pendidikan Ganesha	14
10	Universitas Ahmad Dahlan	11

International journals indexed by Scopus are important in publishing articles related to Indonesian professional teacher. The articles that have been published provide comprehensive descriptions of research results that can be the basis for making policies in education. Educational progress is a target achieved through a number of studies. Table 3 describes the journals that contribute to publishing articles on the theme of Indonesian experienced teachers. Table 3 also describes total citations.

Table 3. The top ten journals by total publications and citations

No	Source	Documents	Citations
1	Journal of Physics: Conference Series	39	106
2	AIP Conference Proceedings	20	10
3	Indonesian Journal of Applied Linguistics	14	66
4	Universal Journal of Educational Research	10	7
5	International Journal of Evaluation and Research in Education	9	33
6	International Journal of Innovation, Creativity and Change	8	48
7	International Journal of Instruction	8	79
8	Asian EFL journal	7	26
9	Cakrawala Pendidikan	6	17
10	Teflin Journal	6	25

Table 3 shows that articles with the theme of Indonesian professional teachers are included in journals in the social sciences area. A total of 333 of the 464 articles were published in journals in the social sciences area, especially in education. Professional teachers are a study in educational science (Molander & Hamza, 2018). The article on teachers implementing differentiated learning was one of the most impactful because it was cited the most, namely 122 times (Suprayogi et al., 2017).

Bibliometric analysis displays data from leading researchers who have contributed significantly to Indonesian professional teacher publications. Leading researchers are seen from the number of publications and total citations they have achieved. Table 4 shows the number of publications and citations of well-known researchers involved in the theme of Indonesian professional teachers.

Table 4. Table 4. The top ten authors contributing to the Indonesian Professional Teacher publication

No	Author	Total Publication (TP)	Total Citation (TC)
1	Wiyono, B.B.	6	31
2	Lie, A.	5	91
3	Sari, E.	5	16
4	Widiati, U.	5	10
5	Widodo, A.	5	40
6	Gozali, I.	4	75
7	Hamied, F.A.	4	47
8	Mukminin, A.	4	29
9	Rahmawati, Y.	4	42
10	Suyatno, S.	4	8

Table 4 shows the ranking of leading researchers in terms of total publications and citations. If you pay attention, researchers with many complete publications are not always in line with the full citations. For example, Wiyono, B.B. has six publications, but most citations fall on Lie, A., which only has five publications. This condition occurs due to several factors, both the article's quality and the journal's. The most cited article raised the theme of using online learning in the era of the COVID-19 pandemic (Gozali et al., 2021). The use of digital technology should be an additional competency of a professional teacher (Fernández-Batanero et al., 2022; Xie et al., 2017). The presentation in Table 4 provides opportunities for research collaboration with well-known researchers working in the field of Indonesian professional teachers. The presentation of Table 4 can be visualized in Figure 4.

We conducted a co-citation analysis using the unit of analysis of cited authors. Figure 4 describes the citation patterns by well-known researchers on the theme of Indonesian professional teachers. Creswell, J.W. is a renowned researcher whose work results are used by many researchers as a basis for their research direction. Creswell, J.W. is the author of books and articles often used in education, including the themes of Indonesian professional teachers. The work of Creswell, J.W. The popular ones raise the theme of research design, including quantitative, qualitative, and mixed methods (Guetterman et al., 2015; Levitt et al., 2018).

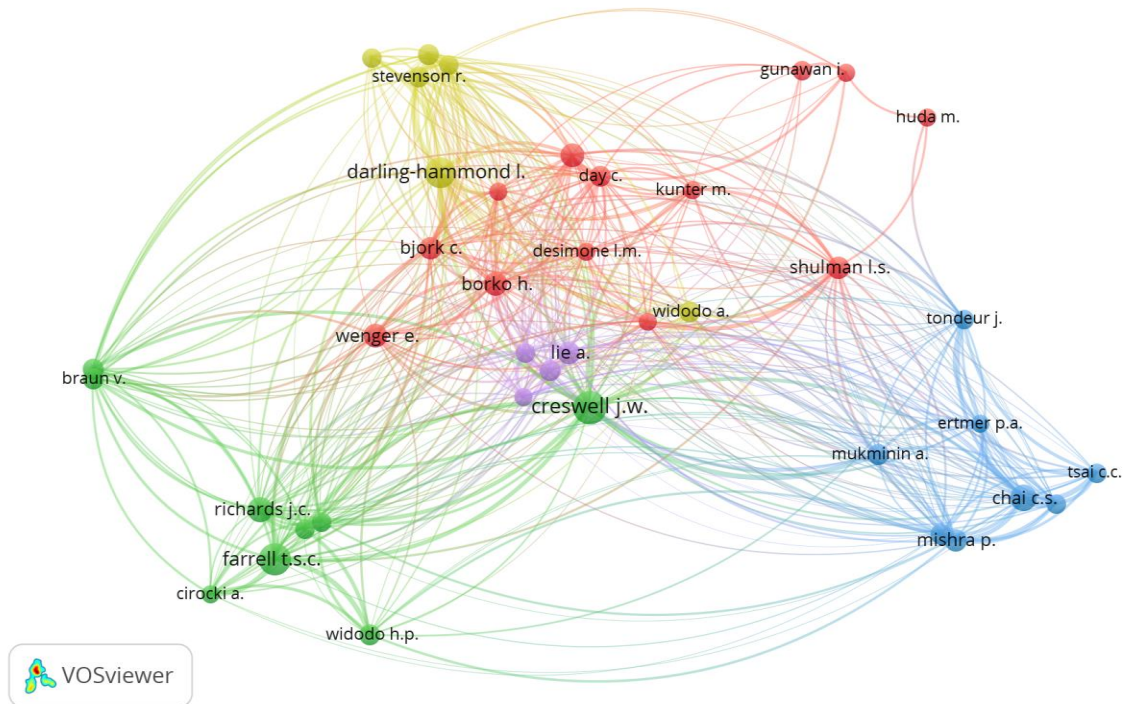


Fig. 4. Co-citation analysis of cited authors

The trend in publication themes related to Indonesian professional teachers leads to various keywords. Trends in publications on the theme of Indonesian experienced teachers are the basis for future research and publication directions. Novelty research and publication opportunities are the output of the results of this analysis. Figure 5 depicts the description of keywords from the results of Indonesian professional teacher publications.

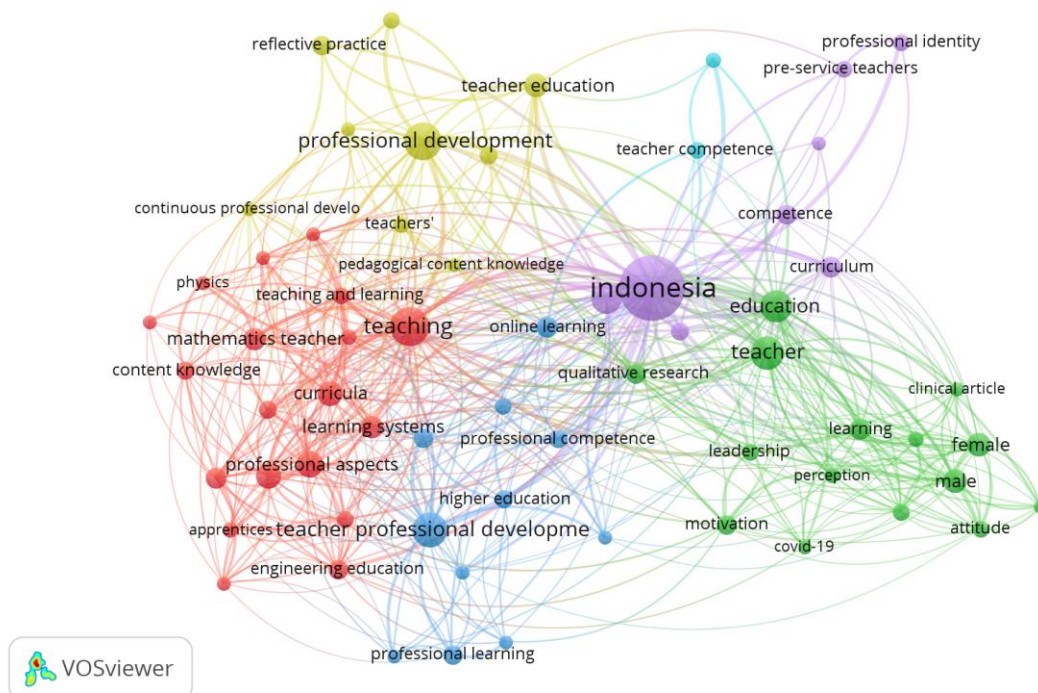


Fig. 5. Co-occurrence network of study themes based on author keywords

The analysis in Figure 5 is based on all author keywords and uses co-occurrence analysis with a minimum occurrence of 5 of the 1888 that appear, and 71 keywords met the threshold. The dominant keywords in publications about Indonesian professional teachers are Indonesia, teaching, professional development, teacher professional development, and teacher. Opportunities for new research focus on keywords such as online learning community, pedagogical content knowledge, professional development program, professional knowledge, professional training, STEM (Science, Technology, Engineering and Mathematics), teacher learning, and teaching practice.

Indonesian professional teacher is a research theme that continues to be carried out today. Research was carried out to implement a professional development program, the output of which was increasing teachers capacity to carry out learning in the classroom (Kennedy, 2016; Loughran, 2014). Future researchers are expected to be able to look more deeply at topics such as professional knowledge, professional training, and teaching practice. Professional knowledge is an aspect that triggers a teacher's commitment to becoming professional (Lauer mann & König, 2016). This theme has not been widely researched and is an opportunity for researchers to explore. Apart from that, professional training is also a topic worth investigating. Moreover, professional training is urgently needed in Indonesia, especially preparing experienced teachers (Nurtanto et al., 2022). Teaching practice is another topic that needs to be explored through the research process. A teaching practice model that can accommodate teachers' skills in carrying out learning in the classroom is needed (Ahmad et al., 2019).

4. Conclusion

Professional teacher is a popular publication theme in Indonesia. The research and publications produced are a basis for formulating policies. The results of the bibliometric analysis show that Indonesia is the country that has the highest role in the number of publications and citations. From a line of renowned researchers, Wiyono, B.B. and Lie, A. have the highest number of publications and citations on the theme of Indonesian professional teachers. Of the total publications, 39 articles were published in the Journal of Physics: Conference Series. Bibliometric analysis opens up opportunities to conduct further research by revealing more deeply the themes of online learning communities, pedagogical content knowledge, professional development programs, professional knowledge, professional training, STEM (Science, Technology, Engineering, and Mathematics), teacher learning, and teaching practicum.

Acknowledgment

We thank the STAI Ma'arif Magetan, which has provided moral and material support to publish this scientific article.

Declarations

- Author contribution** : Indah Setianingrum, prepares instruments, explores research data, and compiles scientific articles. Augusto Da Costa, prepares the paper and proofreading the paper.
- Funding statement** : Not available information about funding statement.
- Conflict of interest** : The author declares that no conflict of interest regarding the publication of this manuscript
- Additional information** : No additional information is available for this paper.

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