

Bibliometric Review: Elementary and Mathematics Education from Indonesian Authors

Edi Supriyadi^{1*}, Sarah Inayah², Jarnawi Afgani Dahlan³ & Darhim Darhim⁴

^{1*}Sekolah Tinggi Teknologi Bandung, Bandung, Indonesia

²Universitas Suryakencana, Cianjur, Indonesia

^{3,4}Universitas Pendidikan Indonesia, Bandung, Indonesia

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Keywords:	Abstract
<p><i>bibliometric;</i></p> <p><i>elementary education;</i></p> <p><i>mathematics education</i></p>	<p><i>Several studies in the field of elementary education have examined the preparedness of elementary education to meet the challenges of the 4.0 industrial revolution. Unfortunately, there are currently no data that can be considered conclusive regarding the number of international publications pertaining to elementary education in Indonesia. The current study detailed the progress of elementary mathematics education research from the past to the present. Utilizing a literature review methodology, the study determined elementary mathematics education research trends in Indonesia. Then, a bibliometric analysis was conducted with the R package Biblioshiny to evaluate related articles in order to identify research trends, topics, and keywords. This study revealed that among all affiliations and authors, Sriwijaya University's Elementary Mathematics Education is the most influential. The term retrospective analysis currently leads the trend in elementary mathematics education research keyword usage.</i></p>

INTRODUCTION

Background of the Study

Elementary education was a massive undertaking and a defining moment for every child. After the family, elementary school is the most influential institution in children's lives, shaping first and lasting self-views, aspirations, skills, and introductions to their country, culture, and the universe (Bennett, 1986). In Indonesia, elementary education builds children's intelligence, knowledge, personality, noble character, and skills. Fundamental things are like a foundation, supporting everything on top (Dewia & Alam, 2020). It can be concluded that Elementary education in Indonesia is the most influential on children.

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In order to meet the demands of the elementary school education world in the era of the 4.0 industrial revolution, elementary schools are required to remain current with the rapid development of technology and to make use of information and communication technology as an example of advanced technology to make the learning process easier (Rachmadtullah et al., 2020).

There are a number of studies in the field of elementary education that investigate the preparedness of elementary education to meet the challenges posed by the 4.0 industrial revolution (Mariana, 2019; Sumilat et al., 2022). As a result of these issues, a significant amount of study has been carried out to investigate strategies to improve the quality of elementary education all over the world and in Indonesia specifically.

Problem of The Study

Regrettably, up to this point, there has not been any data that can be considered definitive regarding the amount of international publications that are related to elementary education in Indonesia. In point of fact, this data on international publications is very important to be aware of so that academics in the field of elementary education can obtain a map of the evolution of elementary education studies from one year to the next, particularly with regard to Indonesia. As a result, it is essential to conduct research into the most recent advancements in studies pertaining to elementary education.

This study looks at the progression of elementary mathematics education studies from the past to the present day. This time frame was determined in accordance with the criterion that references must be from at least the most recent decade (Penders, 2018). It is essential to use the most recent references in order to ensure that the data acquired are always updated (Sivarajah et al., 2017). In the field of elementary education studies, it is also beneficial to notify the publishing of foreign journals for the purpose of using them as references. The data study focused on the number of publications produced each year, as well as the geographical distribution of writers, the countries from which the authors originated, and the locations of publications of the research.

Several elementary education experts studied elementary education in their nations. (Chun & WU, 2013) analyses and analyzes the aspects, similarities, and contrasts of three ICT strategic plans in elementary education and explores their construction origins and development ideas. No research has surveyed international Scopus publications over time. Scopus is a major publication indexer. Its database covers most foreign journals.

This study used bibliometrics. Researchers can use bibliometric analysis to investigate bibliographic material and analyze citations in scientific journals and other scientific literature. Researchers can utilize bibliographies to evaluate publications' kind and language (Hamidah et al., 2020; Supriyadi, 2022). Bibliometrics was named by (Pritchard, 1969). It studies the quality and quantity of published works. Bibliometric indicators were first used to evaluate research quality (Raan, 1999).

Research's State of the Art

Several studies that examine research trends in elementary mathematics education have been carried out. First, (Kwon & Choi, 2008) which investigated the research trends of articles in Math-Educational journals between 1998 and 2006. After examining the National Assembly Digital Library by entering the keyword 'basic mathematics', 235 articles were found, and content analysis was carried out, and data percentage statistics are obtained. The results of this study are as follows: 1) there has been a steady research effort on basic mathematics education, as 20 or 30 studies have been conducted each year. 2) for research themes, the most common themes are design and learning methods (25.5%), and analysis of curriculum and textbooks (15.3%) are the second most dominant themes. 3) Regarding the study area, the most studied areas are numbers and operations (30.0%). 4) regarding the research method, the most didactic analysis (43.8%). And 5) for subjects, many studies

(21.7%) investigated upper class students. Second, related to Research Trends in Elementary Mathematics Education. (Ha et al., 2010) analyzed research trends in basic mathematics education related to topics, methods, subjects, and content of mathematics from research published in South Korean domestic journals during the last 5 years (2004-2009). Third, a similar study was conducted by (Kim & Pang, 2017) but the time difference certainly provides an update to the data.

Gap Study & Objective

Based on the explanation, no research has surveyed international Scopus publications over time. Scopus is a major publication indexer. Its database covers most foreign journals. As a consequence of this, the objective of this study is to find a solution to the problem by investigating the work done by earlier academics in the field of elementary mathematics education in Indonesia and obtaining documentation from those researchers. The following six research questions (RQs), to be more explicit, will be investigated as a part of this study:

RQ1. How is the growth of research on elementary mathematics education in Indonesia?

RQ2. What are the most relevant and most cited sources in elementary mathematics education in Indonesia?

RQ3. Where are the affiliations of Indonesian authors in elementary mathematics education?

RQ4. What are the subjects of the study of elementary mathematics education in Indonesia?

RQ5. What word trends dominate in elementary mathematics education in Indonesia?

METHOD

Type and Design

The study utilizes literature review approaches to determine elementary math education research trends in Indonesia. Bibliographic analysis was utilized to evaluate related articles to uncover research trends, topics, and keywords (Fahimnia et al, 2015; Feng et al, 2017; Nobre & Tavares, 2017). This bibliometric study assesses the scientific literature, methodology, and subject trends in elementary mathematics education in Indonesia. Trends in foreign publications were studied using the R packages program Biblioshiny. (Plasencia et al, 2018) employed an integrated approach for Biblioshiny mapping in R.

Data and Data Sources

The data in this study are articles on the Scopus database containing keywords and published until 2019. The data search was carried out in one day, January 19, 2020.

Data collection technique

This study has five stages: determining keywords, data search, article selection, data validation, and data analysis. The identification of keywords is based on the goal of this study, namely the study of elementary education from mathematics in foreign publications. Therefore, the keywords are "elementary education" OR "primary education" AND "mathematics" according to the theme of elementary mathematics education.

This study then looked for these terms in worldwide articles published through 2019. These keywords were searched in the Scopus Database in one day, January 19, 2020, to eliminate daily updating bias as the database continues to acquire and update data.

Data analysis

The results of searching foreign publications then picked and validated so the data may be viewed and evaluated. Both selection and validation were carried out in the form of diagrams and data tables that are categorized into several types, namely the development of publications per year, types of publications, core journals, most productive researchers, number of publications based on affiliation

and country, and distribution of themes that are the focus of the study of elementary Education from mathematics. The category was next assessed according to the importance of the article.

RESULTS

In the following table, the data from the mining of articles on elementary education and mathematics education that have been carried out in this research using the Scopus database is shown. After obtaining this metadata in *.csv format, then it is processed to be visualized using biblioshiny. From the results of data processing used in biblioshiny, it was found that from 2008 to 2009, article writers from Indonesia wrote in 14 journal sources with 46 documents consisting of 26 articles and 20 conference papers with an annual growth rate of 26.26 percent.

DISCUSSIONS

The authors should discuss the results and how they can be interpreted in light of prior research and the working hypotheses. Discuss the findings and their implications in the broadest context possible. Additionally, future research directions may be highlighted.

Table 1. Main Information from Elementary Mathematics in Indonesia

Description	Results
Timespan	2008:2019
Sources (Journals, Books, etc)	14
Documents	46
Annual Growth Rate %	26.26
Document Average Age	6.02
Average citations per doc	7.413
References	853
Keywords Plus (ID)	77
Author's Keywords (DE)	87
Authors	113
Authors of single-authored docs	4
Single-authored docs	4
Co-Authors per Doc	3.3
International co-authorships %	21.74
article	26
conference paper	20

RQ1. How is the growth of research on elementary mathematics education in Indonesia?

Table 1 presents a study of the number of publications, broken down by year, as well as the publication frequency, which has been steadily increasing over recent years. The development of publications on elementary mathematics education in Indonesia illustrates the ongoing expansion of publications on elementary mathematics education in Indonesia. Based on these findings the dataset (bit.ly/pendasmtkindo), it is clear that there was a rising pattern of publications each year; thus, this demonstrates that the investigation of elementary mathematics education is becoming an increasingly popular topic for the purpose of research by experts in this field.

Table 2. Annual Publication Growth from Elementary Mathematics in Indonesia

Year	Frecuency of Articles
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2008	1
2009	0
2010	0
2011	3
2012	4
2013	5
2014	4
2015	2
2016	1
2017	2
2018	11
2019	13
Total	46

RQ2. What are the most relevant and most cited sources in elementary mathematics education in Indonesia?

The majority of publications up till 2019 took the form of journal papers and presentations at conferences. Journal on Mathematics Education with 16 publications, Journal of Physics Conference Series 13 with publications, Aip Conference Proceedings with 5 publications, and International Journal of Innovation Creativity and Change with 2 publications.

Table 3. Most Publication Documents from Elementary Mathematics in Indonesia

Sources	Frequency
Journal on Mathematics Education	16
Journal of Physics Conference Series	13
Aip Conference Proceedings	5
International journal of Innovation Creativity and Change	2
International Education Studies	1
International Journal of Emerging Technologies in Learning	1
International Journal of Instruction	1
International Journal of Interactive Mobile Technologies	1
International Journal of Scientific and Technology Research	1
Iop Conference Series Earth and Environmental Science	1

Table 4 reveals the publication venues for the top 10 journals in terms of the number of citations received by each article published in those publications. According to the number of citations, the first place goes to Educational Studies in Mathematics with 17 articles, the second place goes to Educational

Design Research with 16 articles, and the third place goes to Developing Realistic Mathematics Education with 15 articles.

Table 4. Most Citation Documents from Elementary Mathematics in Indonesia

Sources	Articles
Educational Studies in Mathematics	17
Educational Design Research	16
Developing Realistic Mathematics Education	15
Journal for Research in Mathematics Education	13
Educ Stud Math	10
A Decade of Pmri in Indonesia	8
Mathematical Thinking and Learning	8
Assessment and Realistic Mathematics Education	5
Design Research in Statistics Education: on Symbolizing and Computer Tools	5
International Journal of Instruction	5

In bibliometric analysis, the author, research title, number of citations, affiliations, and country are all taken into consideration. As a direct consequence of this, Zulkardi and Putri are known in the field of elementary mathematics education as authors or researchers whose work predominates. Putri had 8 papers published, but Zulkardi published 9, and their only difference was in one of their articles. whereas the distance from the publications that are ranked lower is almost incomparably great, as illustrated in Figure 1.

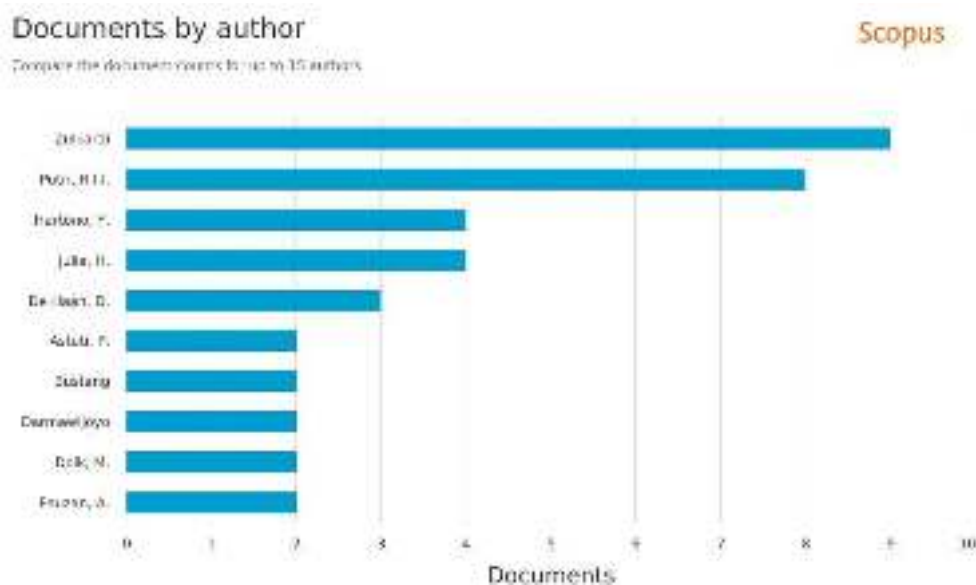


Figure 1. Documents by Author

In spite of this, it is possible to assert that Zulkardi from Sriwijaya University, a senior researcher in the field of mathematics education, is the most prolific writer in the field of research into elementary mathematics education. On the other hand, when looking at citations, the articles from Sembiring have had the most mentions, with a total of 54, and the average number of citations per year is 3.60. This study (Sembiring et al, 2008) is supported by his work entitled "Reforming mathematics learning in Indonesian classrooms through RME," which was published in a previous journal. An experimental

study is reported that describes the fractions curriculum materials used in Indonesian elementary schools. The study is situated within the ongoing reform movement in mathematics. The materials that were generated were well received by the majority of students and teachers in two different schools. The total number of quotations taken from studies conducted on elementary school mathematics education can be found in table 4 below.

Table 5. Most Citation Document From Elementary Mathematics in Indonesia

Paper	Total Citations	TC per Year
(Sembiring et al., 2008)	54	3.60
(Saleh et al., 2018)	40	8.00
(Novita et al., 2012)	40	3.64
(Syafriafdi et al., 2019)	32	8.00
(Putri & Zulkardi, 2018)	26	5.20
(Bustang et al., 2013)	19	1.90
(Haris & Ilma, 2011)	18	1.50
(Fauziah et al., 2018)	13	2.60
(Putri et al., 2018)	13	2.60
(Rudyanto et al., 2019)	9	2.25

RQ3. Where are the affiliations of Indonesian authors in elementary mathematics education?

Universities in Indonesia and the Netherlands are consistently at the top of the rankings for everything from research on elementary mathematics education to institutional affiliation. The four universities that provided the most documents were Sriwijaya University (14), Universiteit Utrecht (7), Freudenthal Institute (6), and Surabaya State University (6). Following those universities in terms of the number of submissions were Syiah Kuala University (4), Yogyakarta State University (4), Indonesian Education University (4), Sanata Dharma University (4), Padang State University (4), and Veranda of Mecca (4) (2). See Figure 2 for a complete breakdown of the affiliates' distribution.

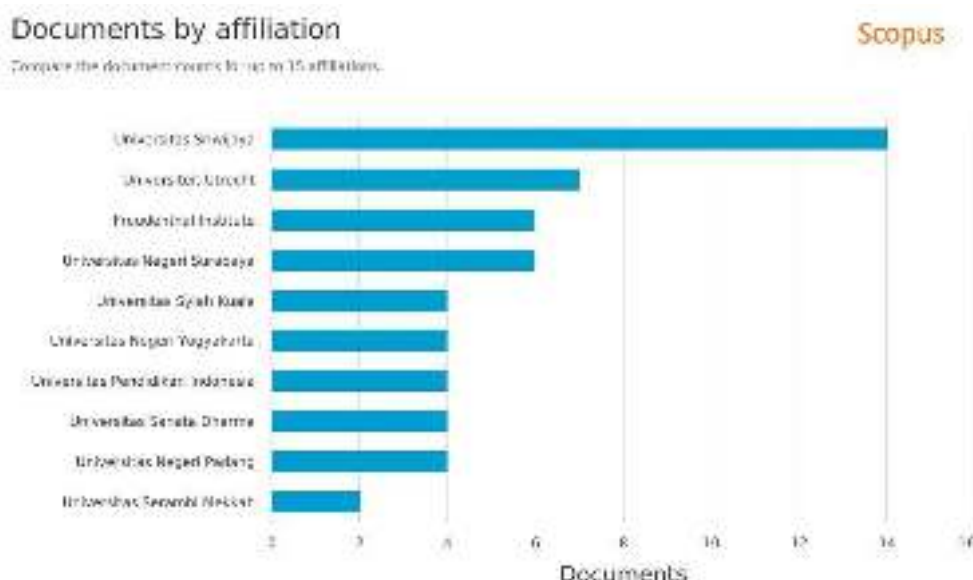


Figure 2. Documents by Affiliation

RQ4. What are the subjects of the study of elementary mathematics education in Indonesia?

With 35.2 percent of the total, Social Sciences will continue to be the most important contributor to research and publications in the field of elementary Mathematics Education through 2019. The scientific field that has made the second-highest contribution is physics and astronomy, with a percentage of 25,4 percent. This is followed by mathematics, which has made the third-highest contribution, with 23,9 percent. Figure 3 below outlines the remainder of the subject areas.

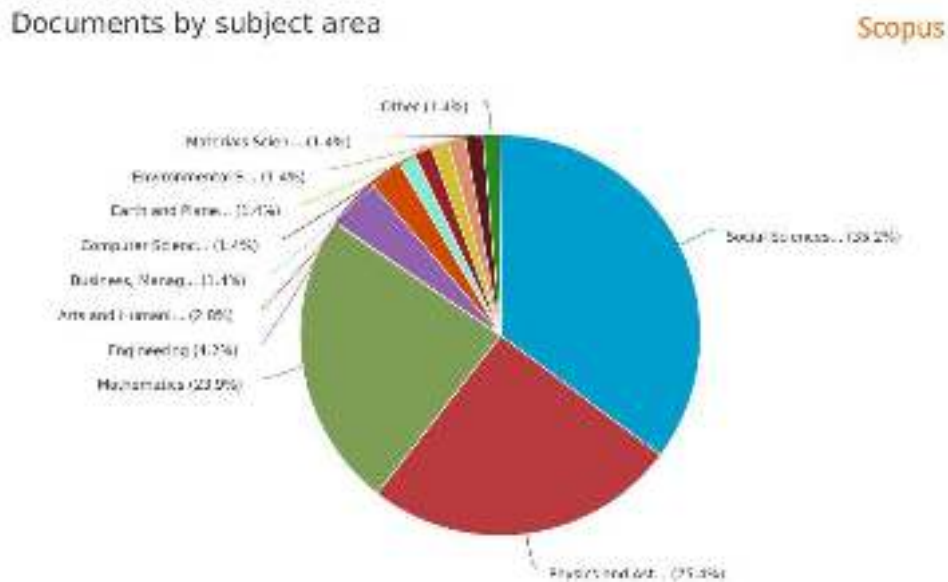


Figure 3. Documents by Subject Area

RQ5. What word trends dominate in elementary mathematics education in Indonesia?

In this particular study, keywords are utilized to determine the knowledge structure of the Mathematics elementary Education domain. Documents associated with this topic include an author keyword frequency analysis and a hierarchical map chart. In this study, an analysis of the authors' keyword usage that was reported in the titles and abstracts of scientific research articles was carried out. The structure of knowledge and discourse in the field of elementary Mathematics Education can be determined through an investigation of the co-occurrence of terms. The study domain dataset on Mathematics elementary Education in Indonesia from 2008-2019 consists of 46 documents and 87 author keywords. This dataset covers the time period from 2008-2019. Table 5 provides more information, which can be found below.

Table 6. Trend Term from Elementary Mathematics in Indonesia

Words	Occurrences
mathematics education	14
Students	13
elementary schools	10
Teaching	7
retrospective analysis	5
design research methods	3
Education	3

education computing	3
instructional theory	3
learning systems	3

This research outlines five different categories of scientific conversation topics that can be used in the context of elementary mathematics education. The topics PMRI and learning are represented by Cluster 1, which is colored red. Cluster 2 (blue) comprises design research, RME, area measurement, and realistic mathematics education. In the meantime, logic, elementary school, and fraction make up the subjects that belong to cluster 3, which is represented by the color green. Figure 4's cluster map and Table 6's accompanying details can be consulted for additional information regarding the mapping.

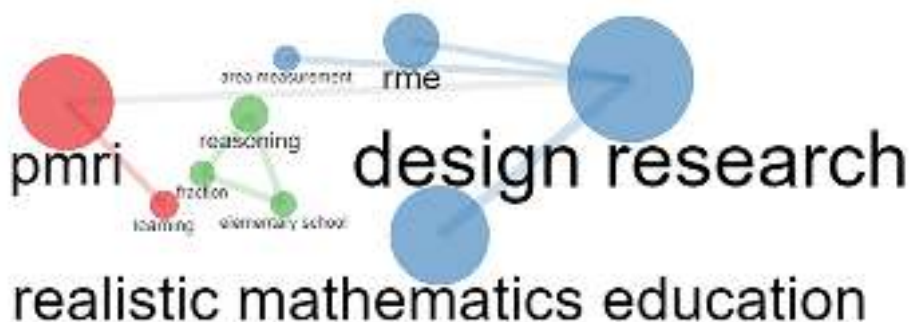


Figure 4. Clustering Term by author's Keywords

Tabel 7. Clustering Term from Elementary Mathematics in Indonesia

Node	Cluster
Pmri	1
Learning	1
design research	2
realistic mathematics education	2
Rme	2
area measurement	2
Reasoning	3
elementary school	3
Fraction	3

DISCUSSION

Journal articles and conference proceedings are expected to be the most common types of publishing in the field of elementary mathematics education in Indonesia during the period of 2008-2019. Journal on Mathematics Education, Journal of Physics Conference Series, and AIP Conference Proceedings were some of the scientific journals that came up during the course of this investigation into the publication of Elementary Mathematics Education. These journals came from the fields of the social sciences, physics and astronomy, and mathematics. The article written by (Saleh et al., 2018) that argues that the PMRI method, which emphasizes the development of students' ability to reason mathematically, is superior to more traditional methods of instruction and has received the most citations from Journal on Mathematics Education.

The findings of the articles that were published as a result of Journal of Physics Conference Series, that the most cited article was article from (Putri & Zulkardi, 2018), which this study researched the A HOTS problem by utilizing the development of a child as the context in order to determine whether or not it could lead students to use their mathematical thinking. And meanwhile, research

conducted by (Zubainur et al., 2015) and published in AIP Conference Proceedings shows that the number of student activities in schools that take the PMRI strategy is significantly larger than the number of student activities in schools that take the traditional approach.

In addition, articles from some of the most frequently cited journals in the field of elementary mathematics education were presented, including *Educational Studies in Mathematics*, *Educational Design Research*, and *Developing Realistic Mathematics Education*. This research discovered that Zulkardi, an academician from Sriwijaya University, was the most prolific contributor to the field of research on mathematics elementary education. Zulkardi has authored 9 different articles on the subject. The article published in *Sembiring* with the title "Reforming mathematics learning in Indonesian classrooms with RME" has received 54 citations as of this moment, with an average of 3.60 citations per year. This information is based on the number of times the article has been referenced. The most cited articles are (Novita et al., 2012), which research on stones. The designed mathematical problem-solving activities may be useful in investigating students' mathematical problem-solving ability in elementary school.

The highest number of articles pertaining to the investigation of elementary mathematics instruction were published by educational institutions in the countries of Indonesia and the Netherlands. This investigation of the teaching of elementary mathematics, which included both students and teachers, was spearheaded by Sriwijaya University. Sriwijaya University (with 14 documents), Universiteit Utrecht (with 7 documents), Freudenthal Institute (with 6) and Surabaya State University (with 6) were the four universities that contributed the most documents (6).

One of the subfields of educational research that is now experiencing a high demand is elementary mathematics education research with an annual growth rate of 26.26% (in Figure 10). This is an opportunity for educational institutions at the postsecondary level to investigate various strategic methods for enhancing the atmosphere of classroom instruction and student learning. The primary objective of research is to identify the reasons behind the occurrence of particular phenomena. The first step in the exploration process is the publication of *Elementary Mathematics Education in Indonesia* by an author who was born in Indonesia but currently attends school outside of Indonesia.

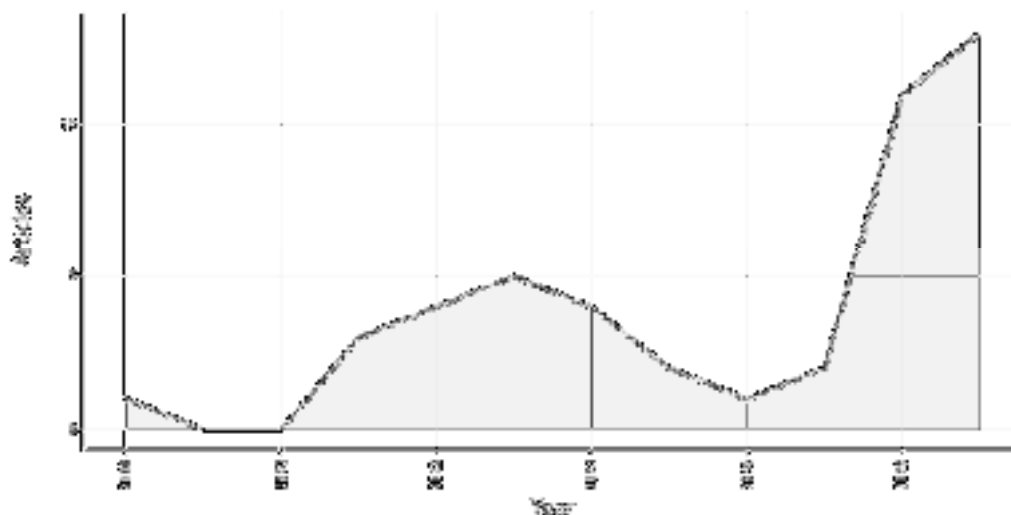


Figure 5. Annual Publication Growth

The information contained in the data records of the Scopus scientific citation database was utilized in order to ascertain the significance of various papers, authors, and publications in the field

of mathematics education at the elementary level in Indonesia. The evaluation of essential journals, conferences, and publications in the field of mathematics elementary education in Indonesia is carried out with the assistance of citation analysis and cluster mapping in this study. links between authors who are affiliated with a variety of institutions, as well as data relating to academics working in universities.

The bibliometric study provides a summary of research tendencies in mathematics elementary education publications and contexts in Indonesia. This might assist academics in seeing the opportunities that are given in the collecting of information on the subject of Mathematics elementary Education in Indonesia. This study sheds light on scientific research being conducted in the field of mathematics education at the elementary level in Indonesia. The development of this research is visualized in a thematic map, which describes the development of elementary mathematics education research in 4 clusters. Of the 4 clusters, they are basic themes, emerging or declining themes, niche themes, and motor themes.

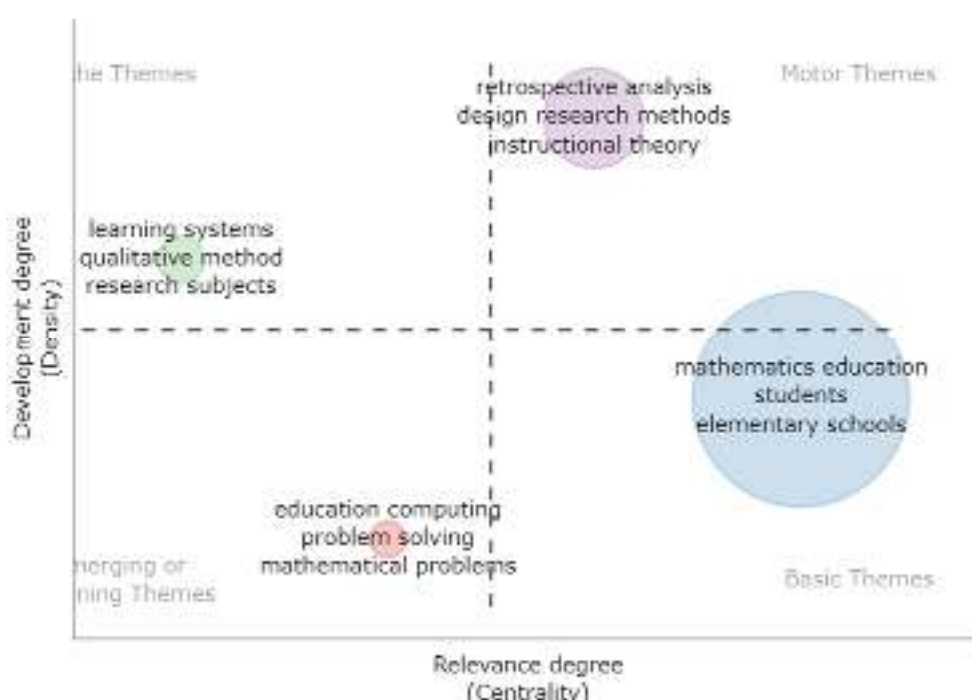


Figure 6. Thematic Map

Thematic Map has been determined that the centrality of the basic theme mathematics education is 4.03, and the density of the basic theme mathematics education is 62.75. Both of these figures were derived from the fact that mathematics education is one of the underlying themes of this investigation. The top five articles with the theme of mathematics education include (Bustang et al., 2013; Novita et al., 2012; Saleh et al., 2018; Sembiring et al., 2008; Syafriaedi et al., 2019).

In the meantime, the motor themes discussed above are examples of term retrospective analyses taken from studies on elementary mathematics education. The value of its centrality is 1.45, and the density of its motor themes is 82.22. At current time, researchers from Indonesia are spending a lot of time and effort into developing and studying motor themes, which are part of their research. In the context of motor theme this study in (Nur et al., 2021)'s research, the term retrospective analysis refers to an action that establishes the trajectory of subsequent learning. In the event that the planned

HLT does not contribute to the development of the concepts, a revised HLT is executed and used for additional learning (Weber et al., 2015).

The impact of research based on motor themes, which is a trending research from the phrase "retrospective analysis" in elementary mathematics education research, a large number of studies has been published and developed by researchers in Indonesia. Among the studies with the term "retrospective analysis" is (Bustang et al., 2013)'s research, which examines in order to teach the notion of angles in Indonesian elementary schools, a local instruction theory has been established. The intervention is an instructional sequence for teaching and learning angle in Indonesian elementary schools. This study's measurable outcomes are the comprehension of the idea of angle, as well as the comprehension of vision lines and blind spots.

The h-index value of (Bustang et al., 2013)'s research is 19. Numerous research articles cite this article, both in Scopus and in journals with indexes outside of Scopus. Following is an article citing (Bustang et al., 2013)'s research; the citations are (Fauziah & Putri, 2017, 2020; Putri, 2019; Putri et al., 2015; Septia et al., 2018). Consequently, it may be concluded that the impact of the term retrospective analysis is currently a trend in research on "elementary mathematics education."

CONCLUSION

Novelty and Contribution / Kebaruan dan Kontribusi

This study reveals exploratory findings in the field of elementary mathematics education, as indicated in previous research that has been conducted. In order to provide information to teachers and higher education institutions on research trends in mathematics education, this study explores the central body of scientific work in the field of elementary mathematics education. The findings indicate that elementary mathematics education will continue to advance and is currently the subject of extensive research conducted by a wide variety of organizations. At the moment, Sriwijaya University is the most influential of all of the affiliations. This is due to the fact that the most prolific authors are members of this affiliation.

Limitation and Future Study / Keterbatasan dan Penelitian Lanjut

The findings of this research still need to be examined in conjunction with those of other studies. This research only uses data from the Scopus database; however, in order to demonstrate developments in a more comprehensive manner, it is also required to do research using data from other databases such as the Web of Science, ERIC, and Google Scholar.

Implication / suggestions (Implikasi / Saran)

The impact of research based on motor themes, which is a trending research from the phrase "retrospective analysis" in elementary mathematics education research, a large number of studies has been published and developed by researchers in Indonesia, specially from (Bustang et al., 2013)'s research. the impact of the term retrospective analysis is currently a trend in research on elementary mathematics education.

REFERENCES

- Bennett, W. J. (1986). *First lessons: A report on elementary education in America*. US Department of Education. <https://eric.ed.gov/?id=ED270236>
- Bustang, Zulkardi, Darmawijoyo, Dolk, M., & van Eerde, D. (2013). Developing a local instruction theory for learning the concept of angle through visual field activities and spatial representations. *International Education Studies*, 6(8), 58–70. <https://doi.org/10.5539/ies.v6n8p58>

- Chun, L. U., & WU, S. Z. (2013). Comparative Research of ICT in Elementary Education Development Strategy in Developed and Developing Countries. *Workshop Proceedings of the 21st International Conference on Computers in Education ICCE 2013*, 512. <http://repository.uhamka.ac.id/id/eprint/52/1/ICCE2013-WorkshopProceedings.pdf>
- Dewia, E. R., & Alam, A. A. (2020). Transformation model for character education of students. *Cypriot Journal of Educational Sciences*, 15(5), 1228–1237. <https://doi.org/10.18844/cjes.v15i5.5155>
- Fahimnia, B., Sarkis, J., & Davarzani, H. (2015). Green supply chain management: A review and bibliometric analysis. *International Journal of Production Economics*, 162, 101–114. <https://doi.org/10.1016/j.ijpe.2015.01.003>
- Fauziah, A., & Putri, R. I. I. (2017). Primary school student teachers' perception to Pendidikan Matematika Realistik Indonesia (PMRI) instruction. *Journal of Physics: Conference Series*, 943(1), 12044. <https://doi.org/10.1088/1742-6596/943/1/012044>
- Fauziah, A., & Putri, R. I. I. (2020). Developing PMRI Learning Environment through Lesson Study for Pre-Service Primary School Teacher. *Journal on Mathematics Education*, 11(2), 193–208. <https://doi.org/10.22342/jme.11.2.10914.193-208>
- Fauziah, A., Putri, R. I. I., Zulkardi, & Somakim. (2018). Primary school student teachers' perception to Pendidikan Matematika Realistik Indonesia (PMRI) instruction. In P. R.C.I. (Ed.), *1st Ahmad Dahlan International Conference on Mathematics and Mathematics Education, AD-INTERCOMME 2017* (Vol. 943, Issue 1). Institute of Physics Publishing. <https://doi.org/10.1088/1742-6596/943/1/012044>
- Feng, Y., Zhu, Q., & Lai, K.-H. (2017). Corporate social responsibility for supply chain management: A literature review and bibliometric analysis. *Journal of Cleaner Production*, 158, 296–307. <https://doi.org/10.1016/j.jclepro.2017.05.018>
- Ha, S.-H., Pang, J.-S., & Ju, M.-K. (2010). Research trends in elementary mathematics education: Focused on the papers published in domestic journals during the recent 5 years. *The Mathematical Education*, 49(1), 67–83. <https://doi.org/10.7468/jksmec.2017.20.1.19>
- Hamidah, I., Sriyono, S., & ... (2020). A Bibliometric analysis of Covid-19 research using VOSviewer. *Indonesian Journal of ...* <https://pesquisa.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/resource/pt/covidwho-1235134>. <https://doi.org/10.17509/ijost.v5i2.24522>
- Haris, D., & Ilma, R. (2011). The role of context in third graders' learning of area measurement. *Journal on Mathematics Education*, 2(1), 55–66. <https://doi.org/10.22342/jme.2.1.778.55-66>
- Kim, Y., & Pang, J. (2017). Research trends in elementary mathematics education: Focused on the papers published in domestic journals during the recent seven years. *Education of Primary School Mathematics*, 20(1), 19–36. <https://doi.org/10.7468/jksmec.2017.20.1.19>
- Kwon, J.-E., & Choi, J.-H. (2008). An analysis of trends in elementary mathematics education research-Focussing on mathematics education journals in Korea. *Journal of Elementary Mathematics Education in Korea*, 12(2), 149–163. <https://doi.org/10.7468/jksmee.2019.33.3.275>
- Mariana, N. (2019). Transformation of research education at elementary school mathematics in the industry 4.0. *International Journal of Innovation, Creativity and Change*, 5(5), 647–656. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85082853166&partnerID=40&md5=bb84f4f8cda8aa94bfeff2a8e9a47898>

- Nobre, G. C., & Tavares, E. (2017). Scientific literature analysis on big data and internet of things applications on circular economy: A bibliometric study. *Scientometrics*, 111(1), 463–492. <https://doi.org/10.1007/s11192-017-2281-6>
- Novita, R., Zulkardi, & Hartono, Y. (2012). Exploring primary student's problem-solving ability by doing tasks like PISA's question. *Journal on Mathematics Education*, 3(2), 133–150. <https://doi.org/10.22342/jme.3.2.571.133-150>
- Nur, A. S., Kartono, K., Zaenuri, Z., & Rochmad, R. (2021). The Learning Trajectory Construction of Elementary School Students in Solving Integer Word Problems. *Participatory Educational Research*, 9(1), 404–424. <https://doi.org/10.17275/per.22.22.9.1>
- Penders, B. (2018). Ten simple rules for responsible referencing. *PLOS Computational Biology*, 14(4), e1006036. <https://doi.org/10.1371/journal.pcbi.1006036>
- Plasencia, M. J. S., García-Vargas, G. R., del Pilar García-Chitiva, M., Caicedo, M. I., & Correa, J. C. (2018). Cyberbehavior: A bibliometric analysis [Preprint]. PsyArXiv. <https://doi.org/10.31234/osf.io/prfcw>
- Pritchard, A. (1969). Statistical bibliography or bibliometrics? In *Journal of Documentation* (Vol. 25, Issue 4, pp. 348–349). cir.nii.ac.jp. <https://cir.nii.ac.jp/crid/1570009750342049664>
- Putri, R. I. I. (2019). New school mathematics curricula, PISA and PMRI in Indonesia. In *School Mathematics Curricula* (pp. 39–49). Springer. https://doi.org/10.1007/978-981-13-6312-2_3
- Putri, R. I. I., Dolk, M., & Zulkardi, Z. (2015). Professional development of PMRI teachers for introducing social norms. *Journal on Mathematics Education*, 6(1), 11–19. <https://doi.org/10.22342/jme.61.11>
- Putri, R. I. I., Gunawan, M. S., & Zulkardi. (2018). Addition of fraction in swimming context. In P. R.C.I. (Ed.), *1st Ahmad Dahlan International Conference on Mathematics and Mathematics Education, AD-INTERCOMME 2017* (Vol. 943, Issue 1). Institute of Physics Publishing. <https://doi.org/10.1088/1742-6596/943/1/012035>
- Putri, R. I. I., & Zulkardi, Z. (2018). Higher-order thinking skill problem on data representation in primary school: A case study. In P. Y.M., P. K.S., A. T.A., U. S., & R. L. (Eds.), *1st International Conference of Education on Sciences, Technology, Engineering, and Mathematics, ICE-STEM 2017* (Vol. 948, Issue 1). Institute of Physics Publishing. <https://doi.org/10.1088/1742-6596/948/1/012056>
- Raan, A. van. (1999). Advanced bibliometric methods for the evaluation of universities. In *Scientometrics*. researchgate.net. DOI: 10.1007/BF02457601
- Rachmadtullah, R., Yustitia, V., Setiawan, B., Fanny, A. M., Pramulia, P., Susiloningsih, W., Rosidah, C. T., Prastyo, D., & Ardhan, T. (2020). The challenge of elementary school teachers to encounter superior generation in the 4.0 industrial revolution: Study literature. *International Journal of Scientific & Technology Research*, 9(4), 1879–1882. <http://www.ijstr.org/final-print/apr2020/The-Challenge-Of-Elementary-School-Teachers-To-Encounter-Superior-Generation-In-The-40-Industrial-Revolution-Study-Literature.pdf>
- Rudyanto, H. E., Ghufron, A., & Hartono. (2019). Use of integrated mobile application with realistic mathematics education: A study to develop elementary students' creative thinking ability. *International Journal of Interactive Mobile Technologies*, 13(10), 19–27. <https://doi.org/10.3991/ijim.v13i10.11598>
- Saleh, M., Prahmana, R. C. I., Isa, M., & Murni. (2018). Improving the reasoning ability of elementary school student through the Indonesian realistic mathematics education. *Journal on Mathematics Education*, 9(1), 41–53. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85061347559&partnerID=40&md5=65cf2b5f8490ae9c3d65406a4892432f>

<http://dx.doi.org/10.22342/jme.9.1.5049.41-54>

- Sembiring, R. K., Hadi, S., & Dolk, M. (2008). Reforming mathematics learning in Indonesian classrooms through RME. *ZDM - International Journal on Mathematics Education*, 40(6), 927–939. <https://doi.org/10.1007/s11858-008-0125-9>
- Septia, T., Prahmana, R. C. I., & Wahyu, R. (2018). Improving Students Spatial Reasoning with Course Lab. *Journal on Mathematics Education*, 9(2), 327–336. DOI:10.22342/jme.9.2.3462.327-336
- Sivarajah, U., Kamal, M. M., Irani, Z., & Weerakkody, V. (2017). Critical analysis of Big Data Journal of Business Research, 70, 263–286
- Sumilat, J. M., Tuerah, R. M. S., & Setiawan, B. (2022). The Utilization of Online Media in Calculation Operations Mathematics Learning in Elementary School Students. *Journal of Educational and Social Research*, 12(3), 90–97. <https://doi.org/10.36941/jesr-2022-0069>
- Supriyadi, E. (2022). A Bibliometric Analysis: Computer Science Research From Indonesia. *TIERS Information Technology Journal*, 3(1), 28–34. <https://doi.org/10.38043/tiers.v3i1.3706>
- Syafriafdi, N., Fauzan, A., Arnawa, I. M., Anwar, S., & Widada, W. (2019). The tools of mathematics learning based on realistic mathematics education approach in elementary school to improve math abilities. *Universal Journal of Educational Research*, 7(7), 1532–1536. <https://doi.org/10.13189/ujer.2019.070707>
- Weber, E., Walkington, C., & McGalliard, W. (2015). Expanding notions of “learning trajectories” in mathematics education. *Mathematical Thinking and Learning*, 17(4), 253–272. <https://doi.org/10.1080/10986065.2015.1083836>
- Zubainur, C. M., Veloo, A., & Khalid, R. (2015). The role of students’ activities in Indonesian realistic mathematics education in primary schools of Aceh. In R. M.F., R. N., J. A.K., M. M.J., & K. M.H. (Eds.), *International Conference on Mathematics, Engineering and Industrial Applications, ICoMEIA 2014* (Vol. 1660). American Institute of Physics Inc. <https://doi.org/10.1063/1.4915705>