Infinity Journal of Mathematics Education
Volume 13, No. 1, February 2024
https://doi.org/10.22460/infinity.v13i1.p233-250

p-ISSN 2089-6867
e–ISSN 2460-9285

GLOBAL TREND OF ETHNOMATHEMATICS STUDIES OF THE LAST DECADE: A BIBLIOMETRIC ANALYSIS

Yohanis Ndapa Deda[1*], Hermina Disnawati[1], Maximus Tamur[2], Milton Rosa[3]
[1]Universitas Timor, Indonesia
[2]Universitas Katolik Indonesia Santu Paulus Ruteng, Indonesia
[3]Universidade Federal de Ouro Preto, Brazil

Article Info

Article history:

Received May 12, 2023
Revised Jan 25, 2024
Accepted Jan 26, 2024
Published Online Jan 31, 2024

Keywords:

Bibliometric analysis,
Ethnomathematics,
Research trend

ABSTRACT

This study aims to investigate ethnomathematics research trends through bibliometric analysis on widely distributed Google Scholar (GS) and Scopus databases. One thousand seventy-seven papers were reviewed from GS and Scopus databases searched using Harzing's Publish on 9 January 2023. A descriptive study approach was used to investigate the data. The result of this study is that the number of ethnomathematics studies has increased over the last decade (2012-2022). The most productive author based on GS is Rosa from Brazil, and the full author based on Scopus is Widada from Indonesia. The principal authors with the highest citations are Ascher, based on GS, and Muhtadi, based on Scopus, with the highest citations. The Journal of Physics: Conference Series (JPCS) in the last decade is the most crucial source of ethnomathematics documents. Based on VosViewer visualization, Rosa is the author who has the most co-authorship papers and total link strength. The VosViewer displays four clusters related to Ethnomathematics: mathematics education, skills, ethnomathematics studies, and geometry. Our strong recommendations regarding this study are ethnomathematics research related to literacy, numeracy, technocracy, and mathematical abilities. The results can assist relevant researchers in understanding trends in ethnomathematics research and recommend guidelines for other studies.

Corresponding Author:

Yohanis Ndapa Deda,
Department of Mathematics Education,
Universitas Timor
Sasi, Kefamenanu, Timor Tengah Utara, East Nusa Tenggara, Indonesia.
Email: yndapadeda@unimor.ac.id

How to Cite:

Deda, Y. N., Disnawati, H., Tamur, M., & Rosa, M. (2024). Global trend of ethnomathematics studies of the last decade: A bibliometric analysis. *Infinity*, *13*(1), 233-250.

1. INTRODUCTION

The development of the 21st century has changed the cultural values of many countries, causing the cross cultures and even the local culture to be increasingly forgotten (Suprapto et al., 2021). The process of globalization and the growing interconnectedness between cultures pose a challenge to the conventional divisions between culture and self-identity. In addition, technology exacerbates the erosion of culture, hence exacerbating the current generation's deficiency in comprehending their own cultural heritage (García-Osuna,

2018). As a result, the current generation does not know or understand their culture. To preserve culture, students' cultural background needs to be included in school learning (Johansson, 2009; Morotti, 2006; Nguyen, 2017; Suprapto et al., 2021). As a result, teaching and learning that integrates culture and mathematics is required in schools. An example of cultural integration in math learning is the use of traditional food in learning integers and fractions (Deda & Maifa, 2021). The combination of culture and mathematics is known as Ethnomathematics, first introduced by the Brazilian mathematician D'Ambrosio in 1985 (D'Ambrosio, 1985, 2001; Hidayati & Prahmana, 2022; Prahmana & D'Ambrosio, 2020; Rosa et al., 2016; Rosa & Orey, 2021; Rosa et al., 2017).

In 1977, the term ethnomathematics was first used by D'Ambrosio in a speech given at the Annual Meeting of the American Association for the Advancement of Science, in Denver, in the United States. The consolidation of the term ethnomathematics culminated with the lecture entitled: Socio-cultural Bases of Mathematics Education, which was delivered by D'Ambrosio at the opening of the 5th International Congress on Mathematics Education (ICME-5), in Adelaide, Australia, in 1984, which officially established the Program Ethnomathematics as a research field. In 1985, D'Ambrosio and other ethnomathematicians, such as Gloria Gil created the International Study Group on Ethnomathematics (ISGEm), which launched the Ethnomathematics Program internationally (Rosa & Orey, 2014).

Ethnomathematics is essential in school teaching and learning. Integrating ethnomathematics and cultural-based mathematics in the schools aims to help students be more interested in learning mathematics (Fouze & Amit, 2023). Implementing cultural-based education today is essential, especially in primary and elementary schools to preserve the cultural values of a community group. Cultural values as the identity of a nation must be maintained and held (Arisetyawan et al., 2014).

Ethnomathematics researchers worldwide have argued the importance of ethnomathematics study, exploration, and integration in learning mathematics. However, there has not been a thorough study that shows research patterns from around the world in the last ten years. For example, in bibliometric analysis related to ethnomathematics in Indonesia, Pradana et al. (2022) analyzed 65 articles from the Scopus database (2020-2022). Muhammad et al. (2023) used 478 pieces from Google Scholar (GS) database (2017-2022). Rusli and Safaah (2023) performed data analysis from GS in the same period as this research.

However, several aspects have not been specified, such as the top author's affiliation and county or origin and document type. In addition, the time range for Rusli 's research from 2012 to 2022 was carried out on October 20, 2022, not yet completed in 2022, based on suggestions from Rusli and Safaah (2023) that bibliometrics analysis needs to use data other than GS metadata. In addition, bibliometric analysis facilitates the examination and evaluation of enormous quantities of scientific data, providing insights into new areas and evolutionary intricacies within certain disciplines (Donthu et al., 2021). A comprehensive bibliometrics analysis of the ethnomathematics is important to advance our understanding of the existing literature from worldwide. The long-term impact if you want to learn ethnomathematics, you should refer to articles written by top authors in the field of ethnomathematics. In addition, getting new ideas on ethnomathematics articles written by top authors and top journals is important. So, to provide a comprehensive bibliometric analysis, GS and Scopus databases were used simultaneously from 2012 to 2022.

Thus, this study emphasizes research trends in ethnomathematics during 2012-2022 with seven investigation questions:

a. What is the output of publications on Ethnomathematics in the last ten years?
b. To how widely are ethnomathematics papers distributed among nations and organizations worldwide?

c. Who was the first place of author of Ethnomathematics Worldwide?
d. What is the pattern of publication of Ethnomathematics based on the source's title?
e. How does the author interact with ethnomathematics study trends?
f. How to visualize the results of ethnomathematics research trends?
g. What recommendations are for future ethnomathematics research in mathematics teaching and learning?

These questions helped us to examine the embeddedness of mathematics in culture by drawing from a body of literature during the development of an investigation on ethnomathematics research trends through bibliometric analysis on widely distributed Google Scholar (GS) and Scopus databases.

2. METHOD

This study uses a literature based on bibliometric analysis of the paper, providing a valuable reference experience on time ahead research (Kulakli & Osmanaj, 2020; Thanuskodi, 2010). In academic study, getting a new, more comprehensive perspective from the study that has been done on relevant and up-to-date content is essential. Bibliometric analysis profiles will guide research activities worldwide (Espina et al., 2022; Wu et al., 2022). This bibliometric analysis stage adopts the PRISMA protocol (Tamur et al., 2023).

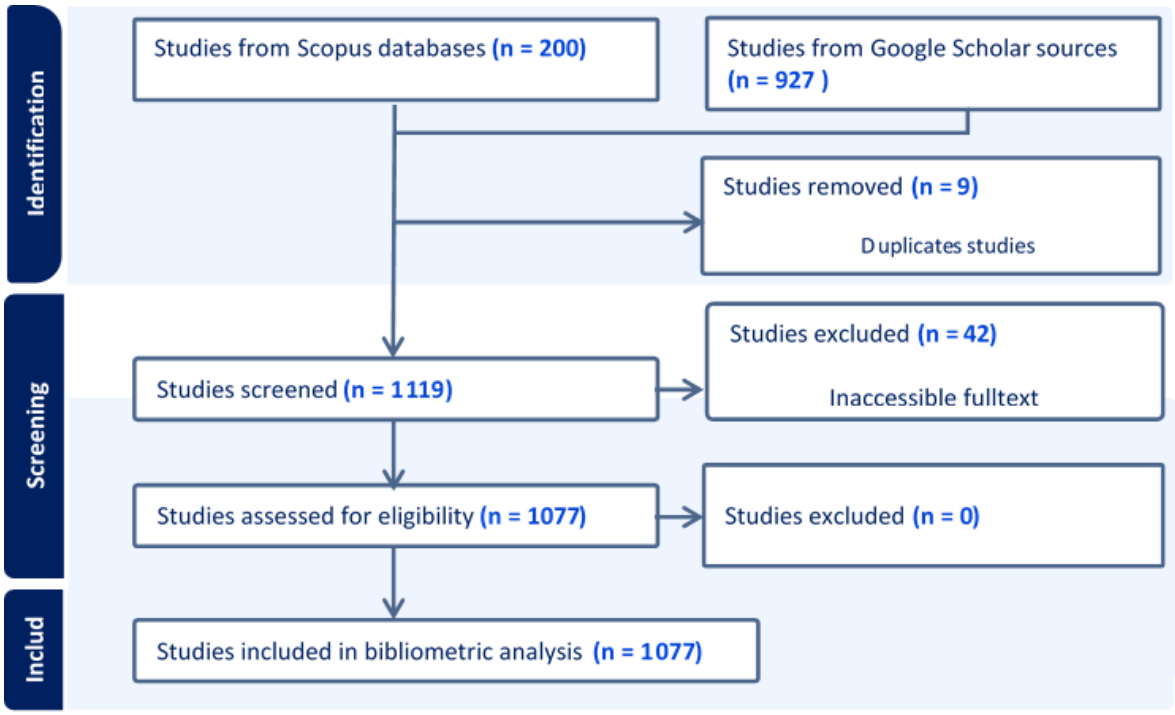

Figure 1. Flowchart of research method

The research stages according to PRIMSA stage on Figure 1 are (i) Searching studies by entering the keyword "Ethnomathematics" in the title word menu section of Google Scholar search on PoP; to get metadata from Scopus databases, the Preferences from GS was changed to a Scopus search on PoP and also enter the keyword "Ethnomathematics". Total studies from 2012-2022 is 1127, they are 200 from Scopus and 927 studies from GS; (ii) Screening publication. Before the screening, first, identify nine duplicate papers in Scopus and GS. There were 42 studies out of 1119 papers that were excluded because the full-text

PDF was not accessible; (iii) total eligibility studies is 1077 papers which Analysis examining further. There were 1077 papers from GS and Scopus were analyzed by paying attention to authors, titles, abstracts, source titles, and citations in CSV format; next, 1076 all met the requirements because the document type and subject area were not limited; (iv) Perform analysis with the RIS metadata with the help of the VosViewer application. At this stage, a map is created based on bibliographic data to visualize co-authorship and citations. Next, create a map based on text data to visualize Co-occurrence maps based on text data in the form of titles, words, keywords, and abstracts. In this visualization stage, the RIS/ metadata files from GS and Scopus are select simultan to create a map in VosViewer; and (v) Interpretation analysis. At this stage, interpretation and conclusions are made according to the focus and research questions based on the results of CSV metadata analysis and RIS files.

Exploration was carried out to investigate research trends, including the research output, paper source, spreading of countries and organizations, spreading of the production in subject categories, the first place of authors, top citations, and research trends. VoSViewer application was used to find research trends in Ethnomathematics (van Eck & Waltman, 2022).

The limitation on this study is that it is limited to the range of 2012-2022. In addition, using PoP as a source of Scopus and GS metadata. CSV and RIS metadata are not directly retrievedfrom Scopus and Google Scholar websites.

3. RESULT AND DISCUSSION

3.1. Results

Figure 2 shows the number of studies related to Ethnomathematics based on Scopus and Google Scholar (GS) databases from 2012 to 2022.

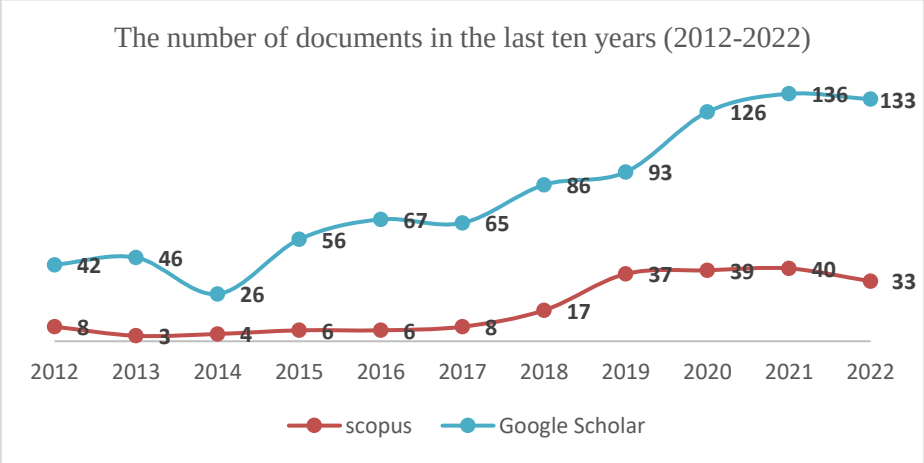

Figure 2. The trend of ethnomathematics research

There are a total of 1077 search documents from GS related to ethnomathematics throughout the year on widespread and open access, and from the Scopus database using publish or perish. Based on Scopus and GS databases, the quantity of copies of ethnomathematics from 2012 to 2022 has increased. Based on the trendline of the data in Figure 1, can predict the total of ethnomathematics documents found in Scopus and GS database at least in the next three years will still increase. Table 1 shows the top five authors based on the number of documents from GS worldwide from 2012 to 2022.

Table 1. Top five productive authors base on GS

No	Authors	Affiliation	Country Origin	Total
1	M. Rosa	Universidade Federal de Ouro Preto	Brazil	34
2	W. Widada	Bengkulu University	Indonesia	17
3	U. D'Ambrosio	State University of Campinas	Brazil	16
4	J.B. Darmayasa	Universitas Borneo Tarakan	Indonesia	11
5	D. Herawaty	Bengkulu University	Indonesia	11

In terms of the most prolific authors (see Table 1). Milton Rosa from Brazil has 34 documents, W. Widada 17 documents, Ubiratan D'Ambrosio 16 documents, and Darmayasa and Herawaty each had the same quantity, 11 papers. These authors are among the five most productive authors related to Ethnomathematics in the last ten years (2012-2022).

Table 2. Leading five productive authors based on the Scopus database

No	Authors	Affiliation	Country Origin	Total
1	W. Widada	Bengkulu University	Indonesia	9
2	G. Sunzuma	Bindura University of Science Education	Zimbabwe	6
3	M. Rosa	Universidade Federal de Ouro Preto	Brazil	6
4	D. Herawaty	Bengkulu University	Indonesia	5
5	V. Albanese	University of Granada	Spain	5

Based on the Scopus database (see Table 2), W. Widada from Indonesia dominates with nine documents, followed by Sunzuma and Rosa, each with six documents while Albanese and Herawaty each one had the same quantity, that is, five papers.

Table 3. Top five authors most cited based on Google Scholar (GS) database

No	Authors	Source	Number of Citations
1	Ascher (2017)	Taylor and Francis Press	966
2	Muhtadi et al. (2017)	Journal on Mathematics Education	160
3	Abdullah (2017)	Journal on Mathematics Education	143
4	Arisetyawan et al. (2014)	International Journal of Education and Research	127
5	Widada et al. (2018)	Journal of Physics: Conference Series (JPCS)	116

Table 3 shows the five authors who have the most references in GS, this data is different from Table 1 which states the five authors who have the most documents in GS. In general, the total of documents cited or used as references throughout the year can be seen in Table 3, namely the authors Marcia Ascher (966), Deddi Muhtadi et al. (160), Atje Setiawan Abdullah (143), Arisetyawan et al. (127), and Widada et al. (116). Five authors (Abdullah, 2017; Arisetyawan et al., 2014; Ascher, 2017; Muhtadi et al., 2017; Widada et al., 2018) are the top five most cited in the 2012-2022 period. Furthermore, Table 4 provides information regarding the top five source articles related to ethnomathematics in the last ten years.

Table 4. Top five authors most cited based on Scopus database

No	Authors	Source	Number of Citations
1	Muhtadi et al. (2017)	Journal on Mathematics Education	42
2	Kisker et al. (2012)	Journal for Research in Mathematics Education	41
3	Fouze and Amit (2018)	Eurasia Journal of Mathematics, Science and Technology Education	35
4	Risdiyanti and Prahmana (2017)	Journal of Physics: Conference Series (JPCS)	34
5	Widada et al. (2018)	Journal of Physics: Conference Series (JPCS)	32

Furthermore, Table 5 provides information regarding the top five source article related to ethnomathematics in the last ten years (2012-2022) based on GS and Scopus.

Table 5. Top five source articles (2012-2022)

No	Source Title	Publisher's Country	Total
1	Journal of Physics: Conference Series (JPCS)	USA	91
2	AIP Conference Proceedings	USA	18
3	Revista Latinoamericana de Etnomatemática: perspectivas socioculturales de la Educación Matemática (RLDE-PSDLEM)	Colombia	17
4	Unnes Journal of Mathematics Education	Indonesia	15
5	Bolema: Boletim de Educação Matemática	Brazil	10

Table 5 describes the journals or proceedings that contribute the majority to publishing ethnomathematics research. JPCS is a leading source containing articles on ethnomathematics—meanwhile the leading journal in RLDE-PSDLEM. Overall, the top source article related to ethnomathematics in the last ten years is dominated by Conference Proceedings.

Table 6. Top five source articles based on Scopus

No	Source Title	Publisher's Country	Total
1	Journal of Physics: Conference Series (JPCS)	USA	69
2	Bolema - Mathematics Education Bulletin	Brazil	14
3	International Journal of Scientific and Technology Research	India	11
4	Journal on Mathematics Education	Indonesia	8
5	Eurasia Journal of Mathematics, Science and Technology Education	Turkey	5

According to Table 6, the journal that has published the most ethnomathematics-related articles in the last ten years (2012-2022) based on the Scopus database is the JPCS from the USA.

Table 7. Type of paper based on Scopus and Google Scholar

Scopus	Total	Google Scholar	Total
Article	103	Articles	599
Conference Paper	75	Conference Paper	182
Book Chapter	15	Book Chapter	-
Book	4	Book	15
Review	2	Review	1
Note	1	Note	-

According to Scopus and GS data (see Table 7), the most types of documents were articles, namely 702 articles consisting of 103 articles from Scopus and 599 from GS. In addition to the kind of article, the second place is mainly in the form of conference papers, namely 257 Conference Papers, 75 from the Scopus database and 182 from the GS database.

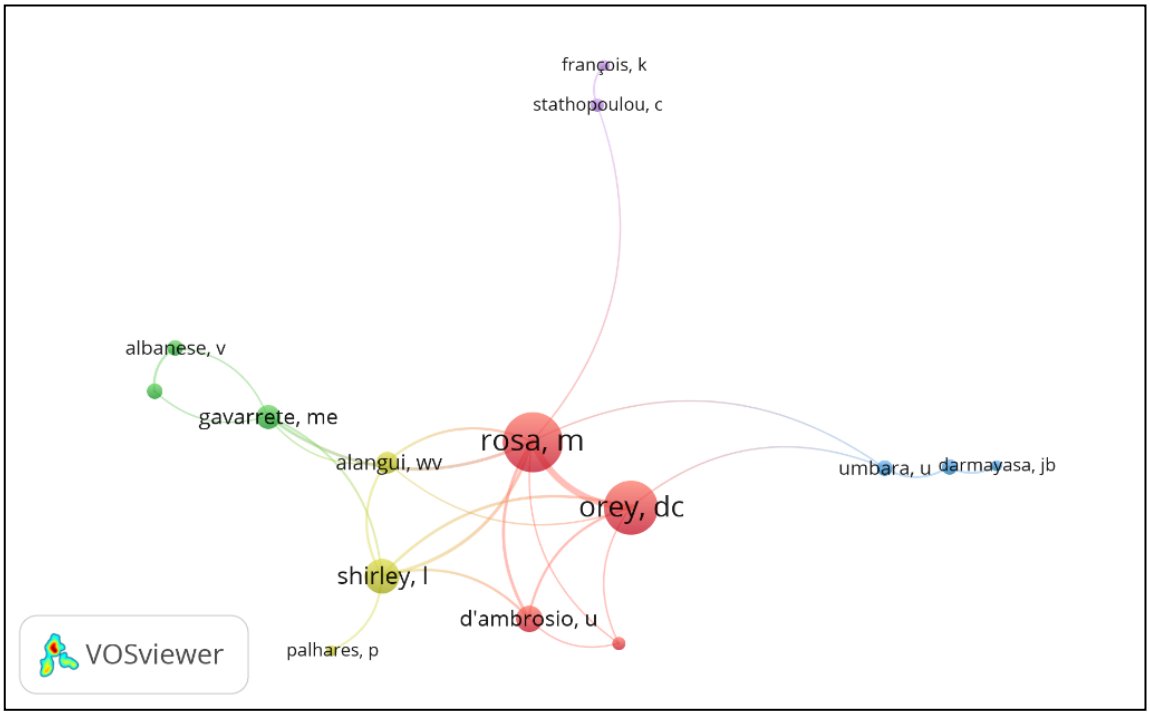

Figure 3. Co-authorship and citation ethnomathematics database on GS and Scopus

Co-authorship and citation visualization criteria consist of 1166 authors in the current decade (see Figure 3). Each document can have a maximum of 25 authors. A minimum of five papers is required for an author. Thirty-nine met the threshold. Based on Figure 3, it is clear that Milton Rosa (Rosa, M.) is the author who has the most co-authorship documents, namely 57 ethnomathematics-related documents, with the highest total link strength, namely 58. The highest real link strength proves that Milton Rosa is the author of the most productive ethnomathematics, the greatest cited. In addition, based on Figure 3, it can be said that Milton Rosa is the author who has collaborated the most with other ethnomathematics authors. Authors with total link strength after Milton Rosa are D. C. Orey, followed by L. Shirley, and U. D'Ambrosio.

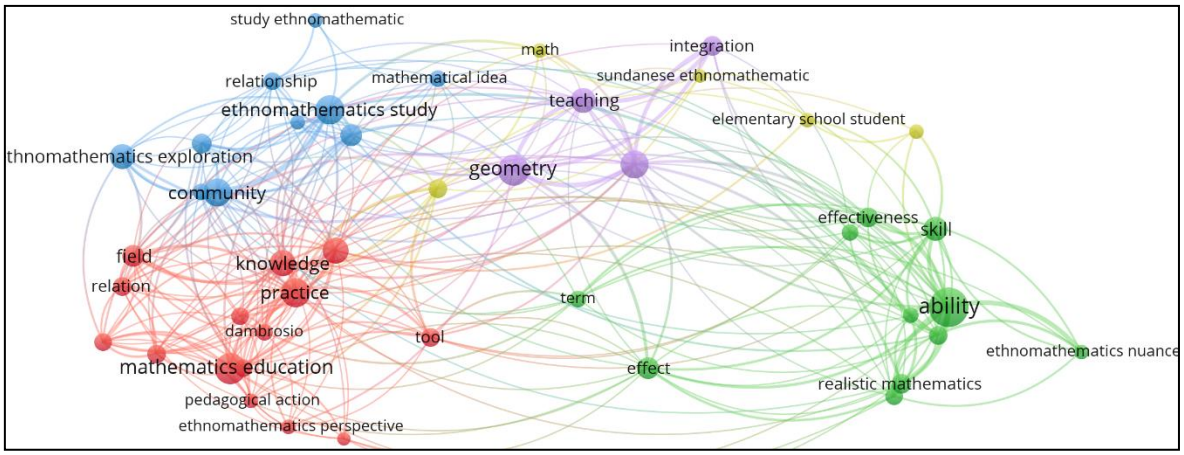

Figure 4. Whole picture of the ethnomathematics database on GS and Scopus

If Figure 4 is zoom out, it shows that there are five ethnomathematics research clusters. However, only four significant groups were discussed mathematics education, abilities, ethnomathematics study, and geometry.

3.2. Discussion

Based on the results of the analysis on CSV data, the output of publications on Ethnomathematics in the last ten years has continued to increase as shown in Figure 2. Based on the country of origin of the five influential authors in Table 1, Indonesia and Brazil are the two countries that have the most prolific authors in the field of ethnomathematics in 2012-2022. Table 2 shows the top five authors based on the total of documents from Scopus worldwide from 2012 to 2022. In addition, Milton Rosa is the most productive author based on CSV data from GS and Widada is the most influential author based on CSV data from Scopus. The first most referenced author is Muhtadi (42 citations in Scopus) (see Table 4) and Ascher (966 citations in GS) (see Table 3).

Based on the country of origin of the five productive authors in Table 2, Indonesia has the most prolific authors in the field of ethnomathematics in a decade (2012-2022). Based on the data in Table 1, Indonesian authors are more dominant in conducting research on ethnomathematics because Indonesia has a multicultural population and the motto "Unity in Diversity". In addition, people of many different racial and ethnic backgrounds and religious and socioeconomic orientations make up Indonesia's multicultural population.

The pattern of publication of Ethnomathematics based on the source's title and after zoom out of the Figure 4, there are four cluster that most significant, mathematics education, ability, ethnomathematics study, and geometry. A description of each cluster and examples are presented below. In addition, the top sources of articles related to ethnomathematics in the last ten years are dominated by Conference Proceedings such as AIP and Iop JPCS. Ethnomathematics research results in the future should be published in peer reviewed journals.

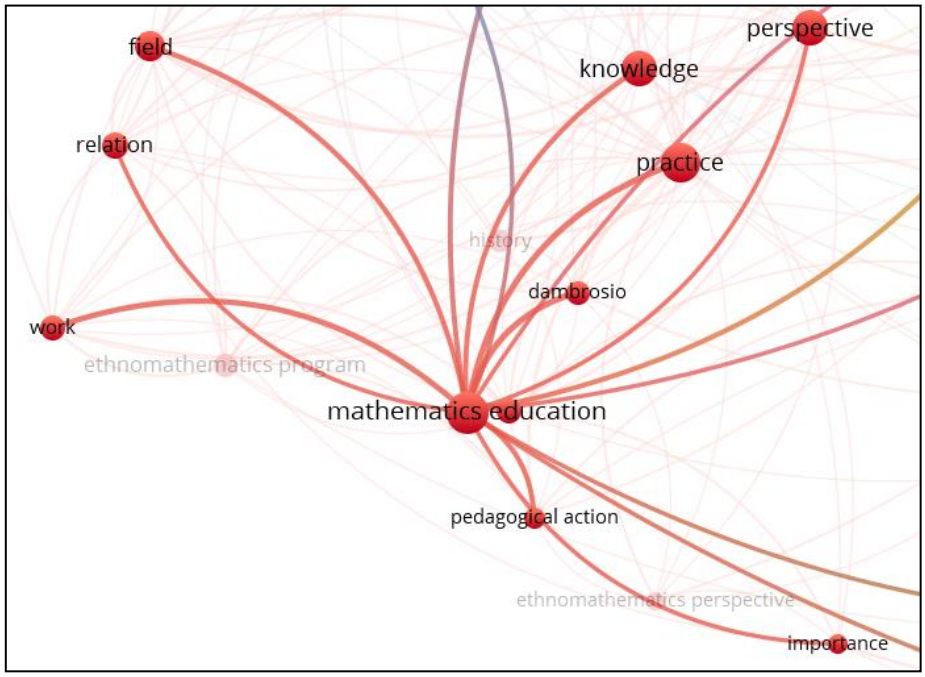

Figure 5. Cluster one mathematics education

Figure 5 shows that cluster one, mathematics education related to importance, practice, need, knowledge, field, challenge, pedagogical action, history, perspective, relation, D'Ambrosio, and ethnomathematics perspective. Several views and findings of ethnomathematics research related to mathematics education, Imswatama and Lukman (2018) tested the effectiveness of ethnomathematics-based mathematics teaching materials, Deda and Disnawati (2019) developed student worksheets on the subject of writing teaching materials for the mathematics education study program. In addition, adding culture to the mathematics curriculum improved students' mathematics performance (Kisker et al., 2012). Various approaches in mathematics education use ethnomathematics, such as educational actions of ethno in class (Bahadir, 2021; Rosa et al., 2016). The development of the idea of an ethno and RME curriculum framework was put forward by Peni in 2019 (Sutarto et al., 2022). Then the concept of the trivium curriculum in the Ethno-RME approach in mathematics education was perfected by Prahmana et al. (2023).

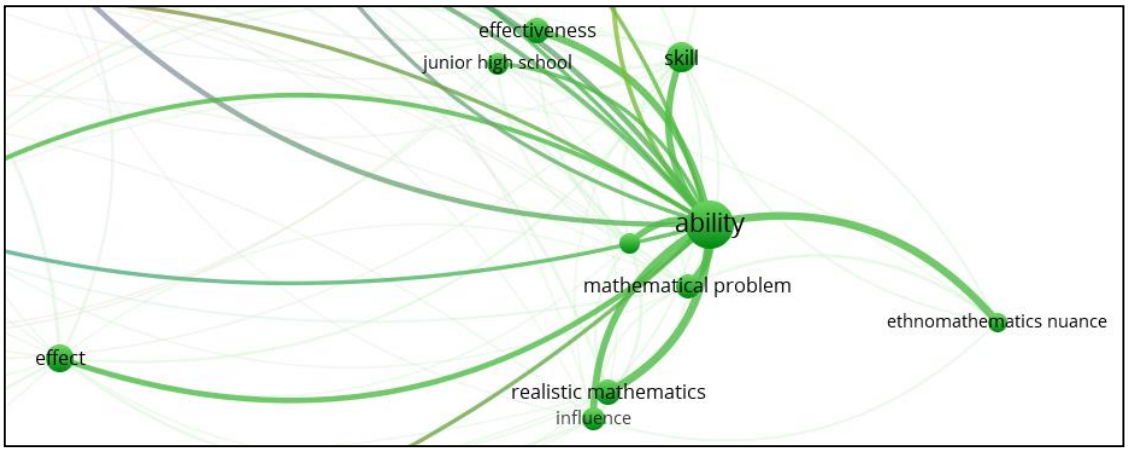

Figure 6. Cluster two the ability

Figure 6 shows that cluster two, ability related to effect, effectiveness, influence, mathematical problem, realistic mathematics, ethnomathematics nuance and impact. Several prospects and findings of related ethnomathematics research ability, Murtafiah et al. (2022) summarize the problem-solving skills portrait of student based on Ngawi ethnography on geometry issues, Ramadhani et al. (2022) also explain the statistical reasoning ability of students in the context of ethnomathematics. Furthermore, there is an influence of ethnomathematics-based learning on mathematics problem-solving ability (PSA) (Apriatni et al., 2022), and the development of ethnomathematics-based e-module can improve mathematical PSA (Sutarto et al., 2022). Imswatama and Lukman (2018) prove that ethnomathematics-based mathematics teaching material is effective. In addition, ethnomathematics nuanced influence mathematical PSA (Amidi et al., 2021; Zaenuri et al., 2021). Furthermore, ethnomathematically-based RME learning can enhance students' cognitive level (Widada et al., 2018), development RME worksheet based on ethnomathematics (Sari et al., 2022), the student responsibility and mathematical literacy ability with RME learning models of ethnomathematics nuance (Wardono et al., 2021).

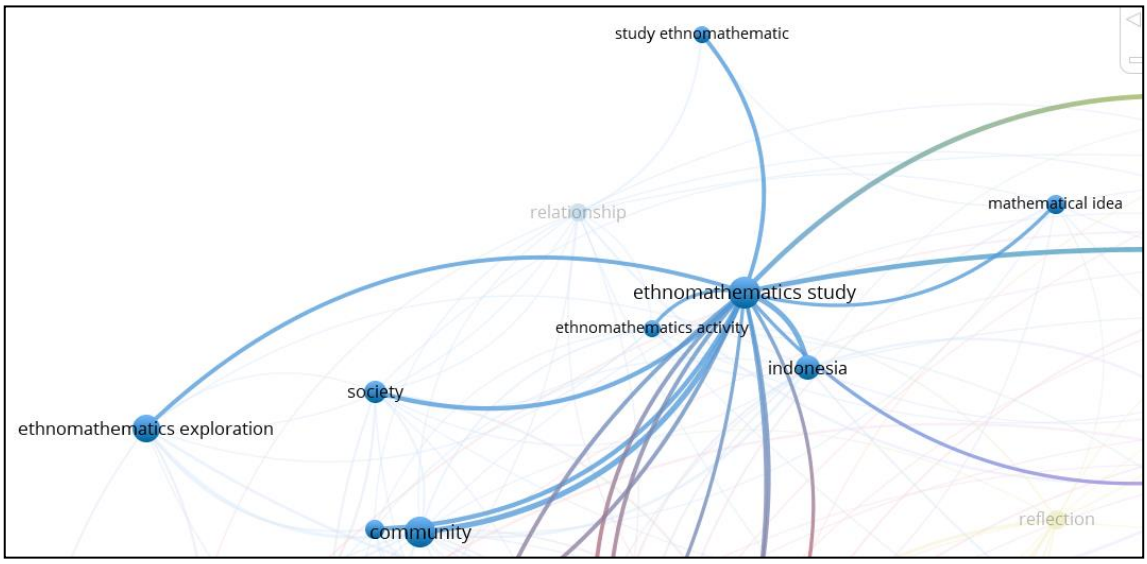

Figure 7. Cluster three: ethnomathematics study

Based on Figure 7, cluster three is ethnomathematics study, Indonesia, ethnomathematics activity, community, society, ethnomathematics exploration, relationship, and mathematical idea. Some ethnomathematics sample studies have existed in the last 10 years, such as ethnomathematics exploration at Riau cultural hall air molek (Mustika et al., 2022), Banten batik motifs (Sianturi et al., 2022), house and traditional music tools Biak-Papua cultural (Sroyer et al., 2018), Meto tribe tradition of corn binding (Taneo & Madu, 2022), people's daily communication (Umbara et al., 2021), Javanese culture, tedhak siten tradition (Risdiyanti & Prahmana, 2017; Wiryanto et al., 2022), sundanese culture (Abdullah, 2017; Muhtadi et al., 2017), woven fabric of Kefamenanu community (Deda & Amsikan, 2019), congklak game in Femnasi village (Taus et al., 2022), traditional house ume kbubu (Tlonaen & Deda, 2021). Most ethnomathematics studies have occurred in Indonesia in the current ten years (Rusli & Safaah, 2023).

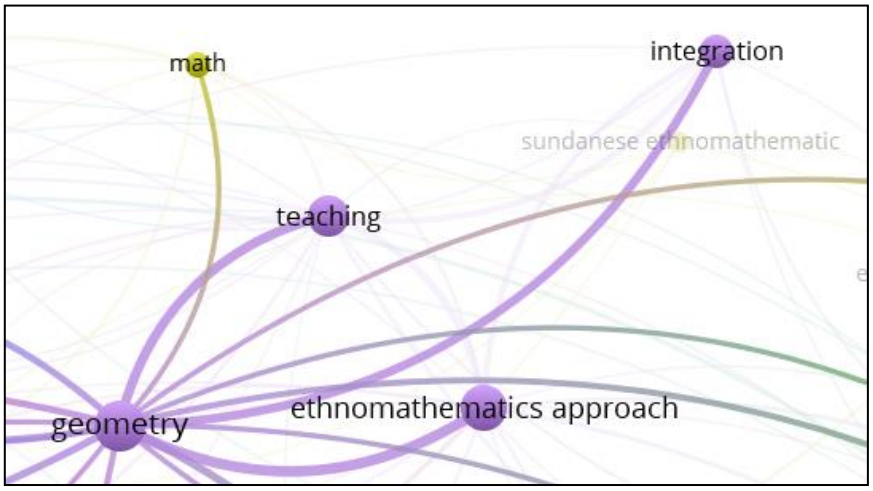

Figure 8. Cluster four: geometry

Figure 8 show that cluster four, geometry, ethnomathematics approach, integration, and teaching. Several ethnomathematics studies that specifically reveal the concept of geometry are transformation geometry on the masjid raya Bandung ornaments (Purniati et al., 2021), geometry concepts in boti tribe culture (Dosinaeng et al., 2020), geometry materials on the motifs of woven fabric (Deda & Amsikan, 2019). In addition, some researchers describe students' PSA on geometry with an ethnomathematics approach (Murtafiah et al., 2022). Several researchers developed a worksheet based on ethnomathematics on transformation geometry (Iskandar et al., 2022), the development of competencies for teaching geometry by ethnomathematical approach (Verner et al., 2019), learning geometry and values from patterns through batik patterns of Yogyakarta (Prahmana & D'Ambrosio, 2020), development of a worksheet based on minimum competency assessment (AKM) on geometry material to improve numeral literacy skills (Miftah & Setyaningsih, 2022). Based on the explanation of Figure 8, the most researched geometric clusters in Indonesia. These findings are consistent with the findings of ethnomathematics research in Indonesia (Hidayati & Prahmana, 2022).

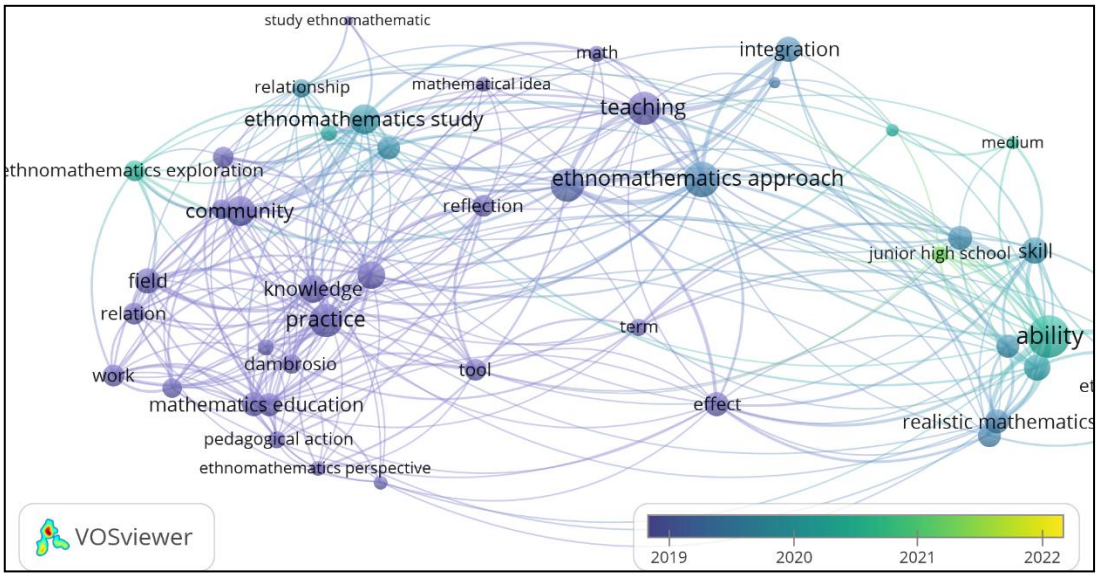

Figure 9. Research novelty in researching ethnomathematics in four years (2019-2022)

Based on the overlay in Figure 9, it is clear that the latest ethnomathematics research related to the Middle School Subject in 2021 and 2022 (Hidaayatullaah et al., 2021; Kusuma & Dwipriyoko, 2021; Murtafiah et al., 2022; Ramadhani et al., 2022). However, apart from the junior high school subject, the keywords in Figure 9 that are not coloured yellow still have a fresh novelty from studying, meaning that ethnomathematics research is still relatively new and opens up new possibilities for linking new topics that are not yet in Figure 9—for example, the relation between Ethnomathematics, numeracy literacy, technoracy, and other mathematical abilities. Furthermore, many cultures still have not been explored, for instance, the traditions of the Papuan tribe, Alor tribe, Sumba tribe, Rote tribe, and community groups in Indonesia. Besides that, it is recommended to bear a comparison of data from the Web of Science and Scopus database in studying ethnomathematics. However, the results of this research may give the eagle eye little assistance in enlightening the body of knowledge specifically correlated to the research on ethnomathematics.

4. CONCLUSION

According to the study, it can be concluded that the total of ethnomathematics studies has expanded over the last decade (2012-2022). Milton Rosa from Brazil is the top productive author based on the quantity of documents in Google Scholar (GS). Based on the total of papers in Scopus, the author is W Widada from Indonesia. Meanwhile, the leading author based on the highest quantity of citations is Marcia Ascher in GS, and Dedi Muhtadi is the highest number of quotations based on Scopus. The JPCS, in the last ten years, has been the most source of ethnomathematics documents. Based on the visualization, Milton Rosa is the author who has the most co-authorship papers and the total link strength. VosViewer visualization shows four clusters related to ethnomathematics research: mathematics education, ability, ethnomathematics study, and geometry.

Based on the findings, several recommendations will be made, namely ethnomathematics research related to literacy, numeracy, and mathematical ability. The results can assist relevant researchers in understanding trends in ethnomathematics research and recommend guidelines for other studies. It is recommended to bear a comparison of data from the Web of Science and Scopus database in studying ethnomathematics. In addition, the results of this research may give the eagle eye little assistance in enlightening the body of knowledge specifically correlated to the research on ethnomathematics.

ACKNOWLEDGEMENTS

The authors would like to thank the LPPM Universitas Timor, which has supported this research. This research is part of the research grant from the Center for Science and Humanities Studies, LPPM Universitas Timor, in 2023 with number: 03/UN60.6/PSSH-FKIP/PP/2023.

REFERENCES

Abdullah, A. S. (2017). Ethnomathematics in perspective of sundanese culture. *Journal on Mathematics Education*, *8*(1), 1-16. https://doi.org/10.22342/jme.8.1.3877.1-15

Amidi, A., Zahrona, S. Z., & Chaniago, A. F. (2021). The influence of self-directed learning on mathematical problem solving ability in problem-based learning with ethnomathematics nuances. *Journal of Physics: Conference Series*, *1918*(4), 042121. https://doi.org/10.1088/1742-6596/1918/4/042121

Apriatni, S., Syamsuri, S., Nindiasari, H., & Sukirwan, S. (2022). The influence of ethnomathematics based learning on mathematics problem-solving ability: A meta-analysis. *Jurnal Pendidikan Matematika (JUPITEK)*, *5*(1), 23-33. https://doi.org/10.30598/jupitekvol5iss1pp23-33

Arisetyawan, A., Suryadi, D., Herman, T., & Rahmat, C. (2014). Study of ethnomathematics: A lesson from the baduy culture. *International Journal of Education and Research*, *2*(10), 681-688.

Ascher, M. (2017). *Ethnomathematics: A multicultural view of mathematical ideas*. Routledge. https://doi.org/10.1201/9780203756522

Bahadir, E. (2021). Ethnomathematics approach in mathematics education for migrant students. *Milli Egitim*, *50*(Special Issue 1), 577-594. https://doi.org/10.37669/milliegitim.959829

D'Ambrosio, U. (1985). Ethnomathematics and its place in the history and pedagogy of mathematics. *For the learning of Mathematics*, *5*(1), 44-48. http://www.jstor.org/stable/40247876

D'Ambrosio, U. (2001). In my opinion: What is ethnomathematics, and how can it help children in schools? *Teaching Children Mathematics*, *7*(6), 308-310. https://doi.org/10.5951/tcm.7.6.0308

Deda, Y. N., & Amsikan, S. (2019). Geometry concept on the motifs of woven fabric in Kefamenanu community. *JRAMathEdu (Journal of Research and Advances in Mathematics Education)*, *4*(1), 23-30. https://doi.org/10.23917/jramathedu.v4i1.6253

Deda, Y. N., & Disnawati, H. (2019). Pengembangan lembar kerja mahasiswa (LKM) etnomatematika menggunakan konteks motif kain tenun Timor [Development of ethnomathematics student worksheets (LKM) using the context of Timorese woven cloth motifs]. *Jurnal Karya Pendidikan Matematika*, *6*(2), 20-26. https://doi.org/10.26714/jkpm.6.2.2019.20-26

Deda, Y. N., & Maifa, T. (2021). Development of student worksheets using the context of local wisdom on integers and fractions. *Jurnal Pendidikan Matematika*, *15*(1), 71-82. https://doi.org/10.22342/jpm.15.1.12824.71-82

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of business research*, *133*, 285-296. https://doi.org/10.1016/j.jbusres.2021.04.070

Dosinaeng, W. B. N., Lakapu, M., Jagom, Y. O., Uskono, I. V., Leton, S. I., & Djong, K. D. (2020). Etnomatematika untuk siswa sekolah menengah: Eksplorasi konsep-konsep geometri pada budaya suku boti [Ethnomathematics for middle school students: Exploration of geometric concepts in boti tribal culture]. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *9*(3), 739-752. https://doi.org/10.24127/ajpm.v9i3.2900

Espina, E., Marbán, J. M., & Maroto, A. (2022). A retrospective look at the research on dyscalculia from a bibliometric approach. *Revista de Educacion*, *396*, 205-234. https://doi.org/10.4438/1988-592X-RE-2022-396-535

Fouze, A. Q., & Amit, M. (2018). Development of mathematical thinking through integration of ethnomathematic folklore game in math instruction. *Eurasia Journal*

of Mathematics, Science and Technology Education, *14*(2), 617-630. https://doi.org/10.12973/ejmste/80626

Fouze, A. Q., & Amit, M. (2023). The importance of ethnomathematics education. *Creative Education*, *14*(4), 729-740. https://doi.org/10.4236/ce.2023.144048

García-Osuna, A. J. (2018). Editor's essay: Good-bye homo sapiens. *IAFOR Journal of Arts & Humanities*, *5*(2), 89-97. https://doi.org/10.22492/ijah.5.2.07

Hidaayatullaah, H. N., Suprapto, N., Hariyono, E., Prahani, B. K., & Wulandari, D. (2021). Research trends on ethnoscience based learning through bibliometric analysis: contributed to physics learning. *Journal of Physics: Conference Series*, *2110*(1), 012026. https://doi.org/10.1088/1742-6596/2110/1/012026

Hidayati, F. N., & Prahmana, R. C. I. (2022). Ethnomathematics' research in Indonesia during 2015-2020. *Indonesian Journal of Ethnomathematics*, *1*(1), 29-42.

Imswatama, A., & Lukman, H. S. (2018). The effectiveness of mathematics teaching material based on ethnomathematics. *International Journal of Trends in Mathematics Education Research*, *1*(1), 35-38. https://doi.org/10.33122/ijtmer.v1i1.11

Iskandar, R. S. F., Ranti, D., & Priatna, N. (2022). Development of ethnomathematics-based worksheet on transformation geometry. *Prima: Jurnal Pendidikan Matematika*, *6*(1), 70-77. https://doi.org/10.31000/prima.v6i1.5343

Johansson, G. (2009). Cultural knowledge in school curriculum in practice: decolonizing processes and school development at Sámi Schools in Sweden. In World Indigenous Peoples' Conference on Education.

Kisker, E. E., Lipka, J., Adams, B. L., Rickard, A., Andrew-Ihrke, D., Yanez, E. E., & Millard, A. (2012). The potential of a culturally based supplemental mathematics curriculum to improve the mathematics performance of Alaska native and other students. *Journal for Research in Mathematics Education JRME*, *43*(1), 75-113. https://doi.org/10.5951/jresematheduc.43.1.0075

Kulakli, A., & Osmanaj, V. (2020). Global research on big data in relation with artificial intelligence (A bibliometric study: 2008-2019). *International Journal of Online and Biomedical Engineering (iJOE)*, *16*(2), 31-46. https://doi.org/10.3991/ijoe.v16i02.12617

Kusuma, D. A., & Dwipriyoko, E. (2021). The relationship between musical intelligence and the enhancement of mathematical connection ability using ethnomathematics and the mozart effect. *Infinity Journal*, *10*(2), 191-202. https://doi.org/10.22460/infinity.v10i2.p191-202

Miftah, R. N., & Setyaningsih, R. (2022). Pengembangan LKPD berbasis asesmen kompetensi minimum (AKM) pada materi geometri untuk meningkatkan kemampuan literasi numerasi [Development of LKPD based on minimum competency assessment (AKM) on geometry material to improve numeracy literacy skills]. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *11*(3), 2199-2208. https://doi.org/10.24127/ajpm.v11i3.5780

Morotti, A. (2006). Integrating culture into education: Self-concept formation in Alaska native youth. In Forum on Public Policy Online.

Muhammad, I., Marchy, F., Naser, A. d. m., & Turmudi, T. (2023). Analisis bibliometrik: Tren penelitian etnomatematika dalam pembelajaran matematika di Indonesia (2017–2022). *JIPM (Jurnal Ilmiah Pendidikan Matematika)*, *11*(2), 267-279. https://doi.org/10.25273/jipm.v11i2.14085

Muhtadi, D., Sukirwan, S., Warsito, W., & Prahmana, R. C. I. (2017). Sundanese ethnomathematics: Mathematical activities in estimating, measuring, and making patterns. *Journal on Mathematics Education*, *8*(2), 185-198. https://doi.org/10.22342/jme.8.2.4055.185-198

Murtafiah, W., Anggreni, R. D., Masfingatin, T., Lukitasari, M., Lestari, N. D. S., & Kholid, M. N. (2022). Profile of student problem-solving ability based on ethnomathematics of Ngawi culture on geometry topics. In AIP Conference Proceedings. https://doi.org/10.1063/5.0099604

Mustika, H., Junedi, B., Ningsih, S. Y., Saragih, I. F. A., Mawarty, K., & Khairiyah, Y. N. (2022). Ethnomathematics exploration at air molek Riau cultural hall air molek. *Indonesian Journal of Ethnomathematics*, *1*(1), 1-14.

Nguyen, T. T. T. (2017). Integrating culture into language teaching and learning: Learner outcomes. *The Reading Matrix: An International Online Journal*, *17*(1), 145-155.

Pradana, K. C., Putra, A. R., & Rahmawati, Y. (2022). Ethnomathematics on traditional culture: A bibliometric mapping analysis and systematic review on database scopus. *International Journal Corner of Educational Research*, *1*(1), 1-8. https://doi.org/10.54012/ijcer.v1i1.61

Prahmana, R. C. I., Arnal-Palacián, M., Risdiyanti, I., & Ramadhani, R. (2023). Trivium curriculum in Ethno-RME approach: An impactful insight from ethnomathematics and realistic mathematics education. *Jurnal Elemen*, *9*(1), 298-316. https://doi.org/10.29408/jel.v9i1.7262

Prahmana, R. C. I., & D'Ambrosio, U. (2020). Learning geometry and values from patterns: Ethnomathematics on the batik patterns of Yogyakarta, Indonesia. *Journal on Mathematics Education*, *11*(3), 439-456. https://doi.org/10.22342/jme.11.3.12949.439-456

Purniati, T., Turmudi, T., Juandi, D., & Suhaedi, D. (2021). Ethnomathematics exploration of the masjid raya bandung ornaments in transformation geometry materials. *Journal of Medives: Journal of Mathematics Education IKIP Veteran Semarang*, *5*(2), 235-243. https://doi.org/10.31331/medivesveteran.v5i2.1639

Ramadhani, R., Saragih, S., & Napitupulu, E. E. (2022). Exploration of students' statistical reasoning ability in the context of ethnomathematics: A study of the rasch model. *Mathematics Teaching Research Journal*, *14*(1), 138-168.

Risdiyanti, I., & Prahmana, R. C. I. (2017). Ethnomathematics: Exploration in Javanese culture. *Journal of Physics: Conference Series*, *943*(1), 012032. https://doi.org/10.1088/1742-6596/943/1/012032

Rosa, M., D'Ambrosio, U., Orey, D. C., Shirley, L., Alangui, W. V., Palhares, P., & Gavarrete, M. E. (2016). *Current and future perspectives of ethnomathematics as a program*. Springer International Publishing. https://doi.org/10.1007/978-3-319-30120-4

Rosa, M., & Orey, D. C. (2014). Fragmentos históricos do programa etnomatemática. *Anais/Acta do 6o. Encontro Luso-Brasileiro de História da Matemática*, 335-358.

Rosa, M., & Orey, D. C. (2021). Ubiratan D'Ambrosio: Celebrating his life and legacy. *Journal of Humanistic Mathematics*, *11*(2), 430-450. https://doi.org/10.5642/jhummath.202102.26

Rosa, M., Shirley, L., Gavarrete, M. E., & Alangui, W. V. (2017). *Ethnomathematics and its diverse approaches for mathematics education*. Springer. https://doi.org/10.1007/978-3-319-59220-6

Rusli, R., & Safaah, T. N. (2023). Research trend on ethnomathematics from 2012 to 2022: A bibliometric analysis. *Indonesian Journal of Science and Mathematics Education*, *6*(1), 37-47. https://doi.org/10.24042/ijsme.v6i1.14794

Sari, N., Salafudin, S., Sholehuddin, M. S., & Sholikhah, A. (2022). Development mathematics realistic education worksheet based on ethnomathematics in elementary school. *Phenomenon: Jurnal Pendidikan MIPA*, *12*(1), 77-89. https://doi.org/10.21580/phen.2022.12.1.10853

Sianturi, C. E., Kiawati, E. S., Ningsih, E. C., Fitria, N. R., Nurjanah, N., & Kusuma, J. W. (2022). Ethnomathematics: Exploration of mathematics through a variety of Banten batik motifs. *International Journal of Economy, Education, and Enterpreneurship*, *2*(1), 149-156.

Sroyer, A. M., Nainggolan, J., & Hutabarat, I. M. (2018). Exploration of ethnomathematics of house and traditional music tools Biak-Papua cultural. *Formatif: Jurnal Ilmiah Pendidikan MIPA*, *8*(3), 175-184. https://doi.org/10.30998/formatif.v8i3.2751

Suprapto, N., Prahani, B., & Cheng, T. (2021). Indonesian curriculum reform in policy and local wisdom: Perspectives from science education. *Jurnal Pendidikan IPA Indonesia*, *10*(1), 69-80. https://doi.org/10.15294/jpii.v10i1.28438

Sutarto, S., Muzaki, A., Hastuti, I. D., Fujiaturrahman, S., & Untu, Z. (2022). Development of an ethnomathematics-based e-module to improve students' metacognitive ability in 3D geometry topic. *International Journal of Interactive Mobile Technologies*, *16*(3), 32-46. https://doi.org/10.3991/ijim.v16i03.24949

Tamur, M., Wijaya, T. T., Nurjaman, A., Siagian, M. D., & Perbowo, K. S. (2023). Ethnomathematical studies in the scopus database between 2010-2022: A bibliometric review. In ICEHHA 2022: Proceedings of the 2nd International Conference on Education, Humanities, Health and Agriculture, ICEHHA 2022, 21-22 October 2022, Ruteng, Flores, Indonesia. https://doi.org/10.4108/eai.21-10-2022.2329666

Taneo, M., & Madu, A. (2022). Ethnomathematics in the Meto tribe tradition of corn binding. *Indonesian Journal of Ethnomathematics*, *1*(1), 55-74.

Taus, F. M. V., Nahak, S., & Deda, Y. N. (2022). Eksplorasi etnomatematika pada permainan tradisional congklak di desa Femnasi [Exploration of ethnomathematics on the traditional congklak game in Femnasi village]. *MES: Journal Of Mathematic Education and Science*, *7*(2), 1-9. https://doi.org/10.30743/mes.v7i2.4979

Thanuskodi, S. (2010). Journal of social sciences: A bibliometric study. *Journal of Social Sciences*, *24*(2), 77-80. https://doi.org/10.1080/09718923.2010.11892847

Tlonaen, M. A., & Deda, Y. N. (2021). Exploration ethnomathematics on traditional house ume kbubu in North Central Timor districts. *Journal of Physics: Conference Series*, *1776*(1), 012016. https://doi.org/10.1088/1742-6596/1776/1/012016

Umbara, U., Wahyudin, W., & Prabawanto, S. (2021). Symbolic measuring: An exploration of ethnomathematics based on people's daily communication. *Journal of Physics: Conference Series*, *1806*(1), 012075. https://doi.org/10.1088/1742-6596/1806/1/012075

van Eck, N. J., & Waltman, L. (2022). *Manual for VOSviewer Version 1.6.18*.

Verner, I., Massarwe, K., & Bshouty, D. (2019). Development of competencies for teaching geometry through an ethnomathematical approach. *The Journal of Mathematical Behavior*, *56*, 100708. https://doi.org/10.1016/j.jmathb.2019.05.002

Wardono, W., Mariani, S., & Kurniati, C. N. (2021). Mathematics literacy abilities and responsibility with realistic mathematics education learning based ethnomathematics. *Journal of Physics: Conference Series*, *1918*(4), 042059. https://doi.org/10.1088/1742-6596/1918/4/042059

Widada, W., Herawaty, D., & Lubis, A. N. M. T. (2018). Realistic mathematics learning based on the ethnomathematics in Bengkulu to improve students' cognitive level. *Journal of Physics: Conference Series*, *1088*(1), 012028. https://doi.org/10.1088/1742-6596/1088/1/012028

Wiryanto, W., Primaniarta, M. G., & de Mattos, R. L. (2022). Javanese ethnomathematics: Exploration of the "Tedhak Siten" tradition for class learning practices. *Journal on Mathematics Education*, *13*(4), 661-680. https://doi.org/10.22342/jme.v13i4.pp661-680

Wu, Y., Cheng, Y., Yang, X., Yu, W., & Wan, Y. (2022). Dyslexia: A bibliometric and visualization analysis. *Frontiers in Public Health*, *10*, 915053. https://doi.org/10.3389/fpubh.2022.915053

Zaenuri, Z., Medyasari, L. T., Dewi, N. R., & Adhi, N. (2021). Auditory, intellectually, repetition with ethnomathematics nuance in improving students' mathematical problem solving ability. *Journal of Physics: Conference Series*, *1918*(4), 042093. https://doi.org/10.1088/1742-6596/1918/4/042093