

Trends and Issues of Ethnoscience Research from 2008 to 2023: A Bibliometric Analysis

Misbahul Jannah^{1*}, M. Noris², Indriyani³

¹ Physics Education Study Program, Faculty of Tarbiyah and Teacher Training, Universitas Islam Negeri Ar-Raniry, Banda Aceh, Indonesia

² Nutrition Study Program, Faculty of Health, Universitas Muhammadiyah Bima, Kota Bima, Indonesia

³ Mechanical Engineering Study Program, Faculty of Engineering, Universitas Sang Bumi Ruwa Jurai, Bandar Lampung, Indonesia

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Corresponding Author:

Misbahul Jannah

misbahulj@ar-raniry.ac.id

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Abstract: This paper aims to analyze research trends on ethnoscience using bibliometric analysis from 2008-2023. The research sample consisted of 153 documents obtained from the Scopus database. The results of the study show that the distribution of publication frequency reaches its peak in 2021 with 32 articles identified. The distribution of research themes consists of 4 primary clusters and 35 secondary clusters. The ethnoscience research area is dominated by social science research (30.2%). The country with the best documents shows that Indonesia is ranked first as the most productive country in publishing on ethnoscience with 74 identified documents. The United States released second place with 28 documents, third Brazil with 10 documents, fourth Canada with 9 documents, and fifth France, Germany, Italy and the Russian Federation with 5 documents each. Institutions that contributed the most came from Indonesia, Universitas Negeri Semarang 22 papers 33.66%, University of Alberta 9 papers 13.77%, Universitas Negeri Surabaya 7 papers 10.71, Universitas Negeri Padang 7 papers 7.65%. The best author with the highest number of citations is Dahdouh. Meanwhile, if we look at the number of documents published by the author, Sudarmin has 10 documents with a contribution of 15.3%.

Keywords: Bibliometric Analysis; Ethnoscience; Research Trend; Trends Ethnoscience; Scopus Database

Introduction

Each country has its own national education system and adopts a national curriculum that fits the context, philosophy, policies and national education strategies influenced by each government system (Muhtadi et al., 2021; Wahyudin, 2004; Yanuar, 2021). When classifying international standard education, it is acceptable to compare one country's system to another as a way of improving the quality of education. This is because comparing the two systems can help academics, practitioners, and policymakers develop and invigorate curricula. In addition, comparison can also mean making an analysis between one system and another in terms of safety, differences, paradigms, processes, etc. Impacts occurring in the educational and social environment (Muhtadi et al., 2021).

The curriculum is an critical factor in schooling as it incorporates many positive factors in order that mastering can run optimally. The curriculum is usually interpreted as an outline of the vision, assignment and desires of the nation's schooling. This concurrently positions the curriculum because the middle of the values so one can take delivery of and addressed to college students. The curriculum is bendy and contemporary, because the curriculum implemented in Indonesia is continually converting in conjunction with the dynamics of social extrade and Indonesia's socio political order as a result of diverse factors, each inner and external (Yanuar, 2021).

The schooling machine has advanced and modified over the years will permit the reader to realize the contemporary demanding situations confronted via way of means of educators, researchers, instructors and

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technological know-how trainer college students in Indonesia and provide a few context for thinking about what troubles are significant (Faisal & Martin, 2019). Curriculum improvement is an incredibly complicated coverage thinking about the epistemological dimension, associated with diverse approaches of knowing, the normative dimension, that is associated to high school desires, and the sensible dimension, has to do with curriculum improvement (Nordin et al., 2018). Ministers of schooling round the arena are getting ready and thinking about curricula that may accommodate twenty first century competencies in conjunction with the instances withinside the generation of the commercial revolution 4.zero and society 5.zero which helps the development of college students with worldwide and worldwide competitiveness. One attempt that may help the sustainability of long-scale schooling is to broaden and layout curriculum.

Considering that 21st century learning emphasizes certain competencies that are expected to be used to provide solutions to social problems in everyday life. One of the efforts of the Indonesian government to produce students who love the country is to make policies and regulations such as the Project to Strengthen Pancasila Student Profiles (P5). P5 is a cross-scientific learning project that prioritizes providing solutions to environmental problems. This is a concrete step to foster a sense of awareness of protecting the environment and culture that was born in the community. The P5 program can be strengthened by implementing Ethnoscience-based learning (C. A. Dewi et al., 2019; Ahmad Khoiri et al., 2019, 2022; Solheri et al., 2022).

Reviewing ethnoscience research is important considering that ethnoscience itself is one of the learning approaches recommended in classrooms. This is based on 3 logical reasons namely; First, ethnoscience-based learning includes learning that utilizes local wisdom as the main topic of learning. Second, the orientation of learning in the classroom requires discovery and research-based or practicum-based actions. Third, learning based on local wisdom is in line with the Pancasila profile in the independent curriculum. Therefore, this review provides an inclusive picture regarding the application of ethnoscience-based learning.

Ethnoscience-based learning is a learning approach based on local wisdom, where students are asked to exploit local beliefs and reconstruct them into pure science reconstructions (Atmojo et al., 2019; C. A. Dewi et al., 2019; Citra Ayu Dewi et al., 2021; Roué, 2020; Suryanti et al., 2021). Ethnoscience-based learning utilizes the culture that lives in society. Considering that Indonesia has a variety of cultures and traditions that

can be utilized in learning (Citra Ayu Dewi et al., 2021; Hikmawati et al., 2021; Sholahuddin et al., 2021a; Suryanti et al., 2021; Zakiyah & Sudarmin, 2022). Therefore, the importance of culture-based learning and local wisdom through an ethnoscience approach is a big foundation for students to explain the reconstruction of science to love nature and culture more that live in society.

Given the importance of reconstructing the cultures that live in society into the reconstruction of pure science through an approach based on local wisdom. So this study aims to conduct a literature study related to the distribution of ethnoscience-based learning. This literature review study aims to provide an exclusive and inclusive picture regarding ethnoscience-based learning methods to researchers, academics, and teachers (Ariyani et al., 2022; Boulden, 2021; Sarıtaş & Topraklıkoğlu, 2022; Suprpto, Sukarmin, et al., 2021). This is also a basic reference for other researchers regarding how the distribution of research on ethnoscience that has been published to Scopus data.

Literature reviews on ethnoscience research have indeed been carried out by several other researchers (Hidaayatullaah et al., 2021; Nuryana et al., 2023; Pradana et al., 2022; Suprpto, Prahani, et al., 2021). So far, the limitations regarding ethnoscience-based learning tracing are very limited for the last 16 years of research. Therefore, the purpose of this study is to provide a comprehensive picture of the distribution of ethnoscience articles from 2008-2023.

Methods

This type of research is a quantitative study with a systematic literature review method using vosviewers software (Ariyani et al., 2022; Nuryana et al., 2023; Pradana et al., 2022; Suprpto, Prahani, et al., 2021). For this study, the literature review procedure from Wu (2013) was used to achieve the desired goals. This study uses the Scopus database (<https://www.scopus.com>) with the distribution of articles from 2008 to 2023. This research refers to research (Hidaayatullaah et al., 2021).

Researchers set certain criteria or inclusion when searching for documents in this study. Articles must be written in English, documents will be published in the form of articles, and the search topic will include education, all documents used in the search contain the word "ethnoscience". A search of the journal database yielded 153 journals containing various types of articles (journals, books, book chapters, proceedings). The researcher then set exclusive criteria and obtained 153 articles.

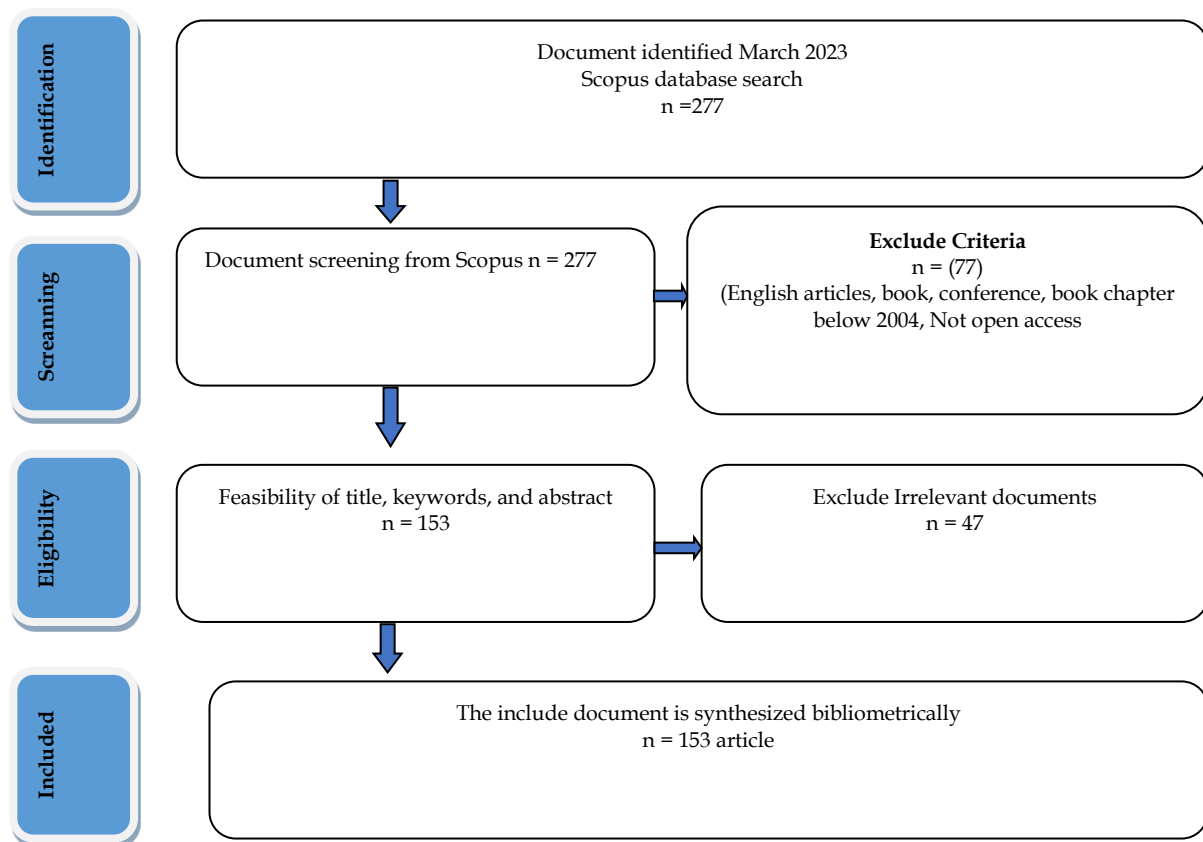


Figure 1. Illustration of A Walkthrough of Ethnoscience (Moher et al., 2009)

153 articles obtained from search results using the Scopus database, then analyzed research distribution from 2008-2023, network of research themes, most cited authoritative documents, organizations that frequently publish, and journals that frequently produce articles. 153 articles were further analyzed by considering relevant research trends. At this stage, the researcher reads the document thoroughly to get accurate data. The included results were further analyzed by full text analysis of papers to maintain data accuracy and by using vosviewers software analysis to obtain research gaps and article distribution (Hidayatullaah et al., 2021; Pradana et al., 2022; Suprpto, Prahani, et al., 2021).

Research Question:

The research questions include; 1) What is the distribution of research on ethnoscience from 2008-2023. 2) How is the network of titles, themes, and keywords research on ethnoscience. 3) What is the distribution of research areas and types of ethnoscience. 4) Which countries were productive in doing related publications on Ethnoscience. 5) Which organization, department, and affiliate published the most Ethnoscience. 6) Who is the author with the best documents cited the most from 2008-20023.

Results and Discussion

The search results identified 153 documents which were then analyzed using vosviewers software. The analysis includes the distribution of ethnoscience frequencies per year (2008-2023), distribution of themes, subject areas and document types, most productive countries, contributing affiliations, authors with the most citations and authors with the most documents.

RQ1: Ethnoscience Research Distribution (2008-2023)

Based on search results in the Scopus database, 153 articles were obtained with a publication frequency distribution that peaked in 2021 with 32 articles identified. Related publications about ethnoscience are seen as something new, especially ethnoscience research in Indonesia and various countries is still relatively small, so there is relatively little attention to ethnoscience learning. However, interestingly, the research orientation experienced a significant increase from 2018 which initially only had 11 articles, then in 2019 it rose to 14 articles, in 2020 there were 23 published articles again, and the research peak will be in 2021. This shows that the research orientation Ethnoscience-based research is one of the fundamental topics that gives special attention to researchers and academics to exploit

ethnoscience (See Figure 1). The distribution of research on Ethnoscience is still very minimal among researchers, especially in Indonesia itself. However, it is possible that there will be a very significant increase in 2023. Based on

search results using all keywords based on "ethnoscience". So you can see the image below (See Figure 2).

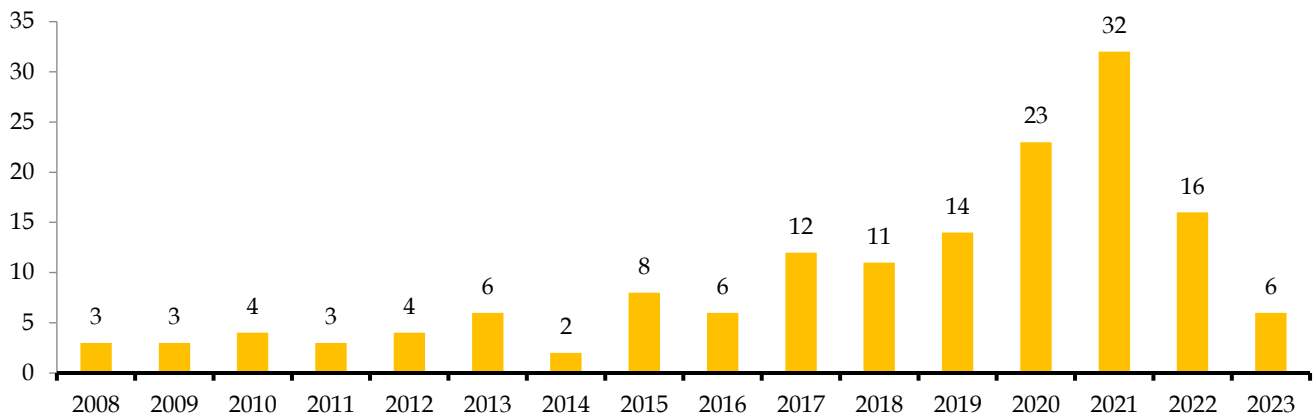


Figure 1. Frequency distribution of ethnoscience publications from 2008-2023

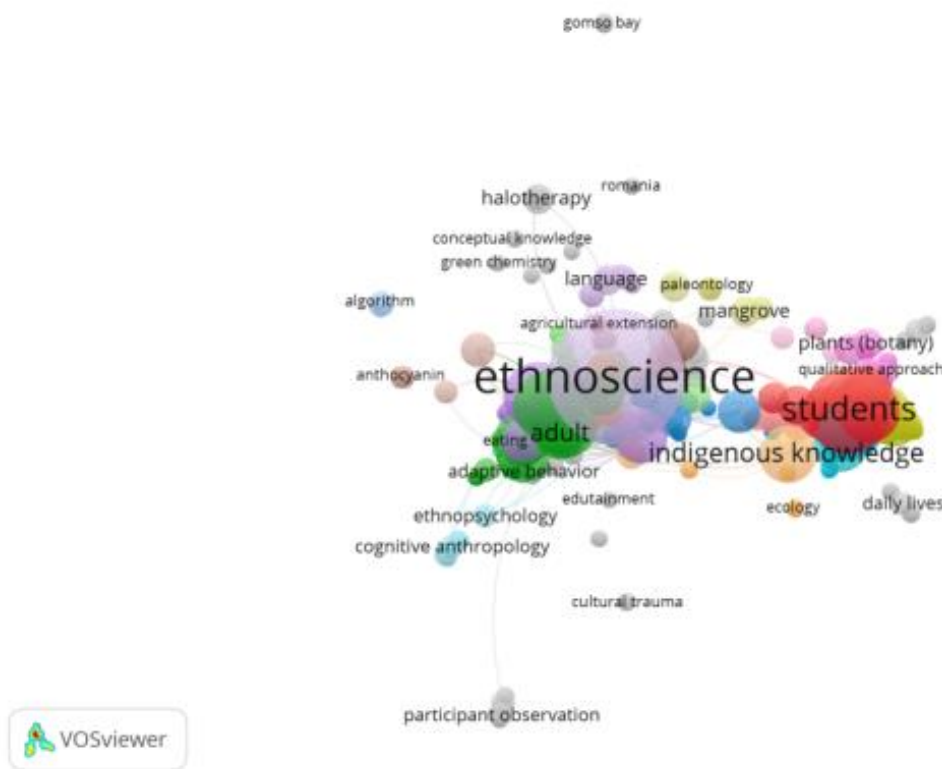


Figure 2. Distribution of ethnoscience themes from 2008-2023

Articles that are stored in CSV form are then visualized with VosViewers software to describe all the key topics related to the research topic. The visualized article contains all keywords, title, and abstract which contains Ethnoscience. As can be seen in Figure 1, it shows that research authority is focused on ethnoscience, but research on the topic of ethnoscience is

connected with several themes such as conceptual knowledge, algorithms, cognitive anthropology, adaptive behavior, and others. This shows that the research orientation on the topic of ethnoscience is used on several occasions for local wisdom-based learning to increase the level of cognitive competence of students.

Ethnoscience-based learning needs to be further exploited considering the natural and cultural wealth that lives in Indonesian society in particular is diverse. One way to determine the extent to which researchers have conducted research on ethnoscience is by using bibliometric analysis using Vosviewer. Bibliometric analysis provides other researchers with a comprehensive view of the instructional impact of ethnoscience (Fought, 1982; Lestari & Fitriani, 2016; Noris et al., 2023; Parson, 1998).

This then provides a complex picture for teachers especially to utilize ethnoscience-based learning into their classrooms (Hidaayatullaah et al., 2021; Ahmad Khoiri et al., 2021, 2022). One of the studies suggested that the teacher's ability to integrate science concepts by neglecting local wisdom-based learning can help students to develop an understanding to respect culture and love for their own culture (Parmin et al., 2015). The development of ethics and attitudes towards protecting

the environment is the teacher's biggest investment in creating students who are aware of their living environment, natural wealth, and respect the culture that lives in society (Citra Ayu Dewi et al., 2021; Ahmad Khoiri et al., 2019; Wilder et al., 2016). Through the ethnoscience approach students are expected to be able to reconstruct abstract knowledge into conceptual knowledge by reconstructing culture into pure science reconstruction (Dahdouh-Guebas & Koedam, 2008; Fought, 1982; Hisatake, 1996; Lenaerts, 2006; Parson, 1998; Roué, 2020; Sudarmin et al., 2019)

RQ2: Network Themes in Ethnoscience Research

The network of research themes about ethnoscience which is then visualized with Vosviewer shows that ethnoscience topics are often used on several occasions to improve students' critical thinking skills, ethnomatematics, teaching strategies, ethnoscience, ethnobiology and ethnobotany. This shows that.

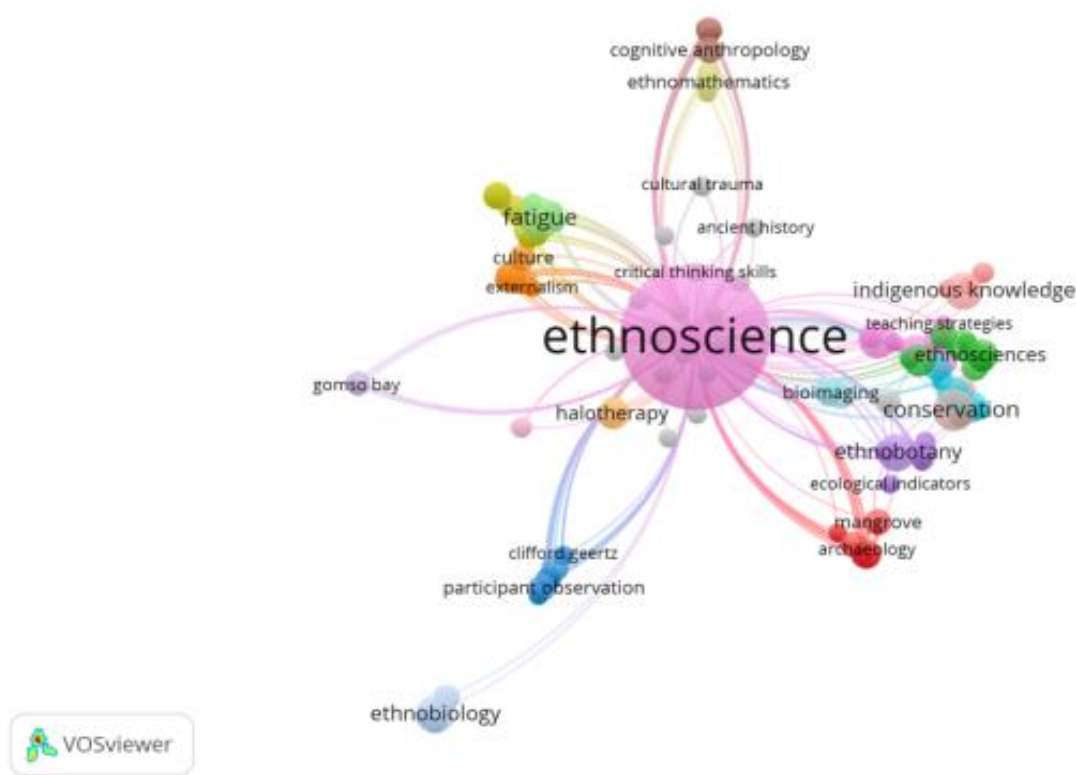


Figure 3. Frequency Distribution of themes on ethnoscience from 2008-2023

Based on the results of the research theme on Ethnoscience, it is then divided into 35 clusters consisting of 4 primary clusters which are shown in cluster 1 namely ethnoscience (Purple), cluster 2 concerning Students and their Application in learning (Red), cluster 3 namely Humans, Culture, and Wisdom local (Green), and cluster 4 consists of the integration of

ethno-STEM, ethno biology, ethno mathematics, and ethnobotany. While the research area on ethnoscience can be seen in the graph below

The spread of publication of related articles on ethnoscience started in 2019, then experienced a significant increase from 2020, and the peak occurred in 2021 with 32 publications on Scopus. The orientation of

publications about ethnosience will continue to increase along with the times and the interest of researchers in the fields of ethnosience, ethno-STEM, ethno-biology, and others. Given the importance of ethnosience-based learning, some of the researchers then integrated ethnosience into learning such as models such as STEM, PJBL, and PBL which were then integrated and combined with ethnosience (Hastuti et al., 2019; Ahmad Khoiri et al., 2022; Sholahuddin et al., 2021b). Ethnosience-based learning is believed to be able to improve students' critical thinking skills (Kanmaz, 2022; Ahmad Khoiri et al., 2019; Liew Wei Li, 2013; Mayarni & Nopiyanti, 2021; Nouri et al., 2020), Scientific literacy and biological literacy (Citra Ayu Dewi et al., 2021; Hastuti et al., 2019; Sholahuddin et al., 2021a; Yuliana et al., 2021), and increase environmental awareness (Hikmawati et al., 2021, 2020; Ahmad Khoiri et al., 2021).

Based on the results of the research theme on Ethnosience, it is then divided into 35 clusters consisting of 4 primary clusters which are shown in cluster 1 namely ethnosience (Purple, cluster 2 concerning Students and their Application in learning (Red), cluster 3 namely Humans, Culture, and local Wisdom (Green), and cluster 4 consists of the integration of ethno-STEM, ethno biology, ethno mathematics, and ethnobotany. The theme most often raised by researchers is a theme related to ethnosience itself which is then associated with learning, the level of environmental awareness, culture and local wisdom, and their application in ethnosience-based learning. Several researchers then focused their research on directing the exploitation of the richness of various cultures, the richness of natural resources, and their awareness in caring for nature and the surrounding environment which was reconstructed into pure science

The purpose of ethnosience-based learning is to get to know and be familiar with the environment, nature, social and culture, as well as provide knowledge and skills for each student to be more useful to himself and the surrounding environment (Munandar et al., 2022).

RQ3: Subject Areas and Types of Ethnosience Research

The research area on ethnosience is dominated by studies in social sciences (30.2%), physics (20.4%), other (10.2%), arts and humanities (9.3%) and several other research scopes. This shows that the research orientation of ethnosience is centered on social science and physics research. Meanwhile, when viewed in terms of the types of documents that are often published in the Scopus database.

This shows that the research orientation of ethnosience is centered on social science and physics research. The subject area of research on ethnosience is domiciled by research on social science which includes biology education, science education, chemistry education, physics education, and social sciences that contribute to the development of science. The subject area of research on ethnosience is dominated by research on social science which includes biology education, science education, chemistry education, physics education, and social sciences that contribute to the development of science. Based on the types of articles above, it can be seen that research on ethnosience is often found in the form of Articles (46.4%). Of the many identified social sciences, the focus is on the final articles that have been published in the Scopus journal.

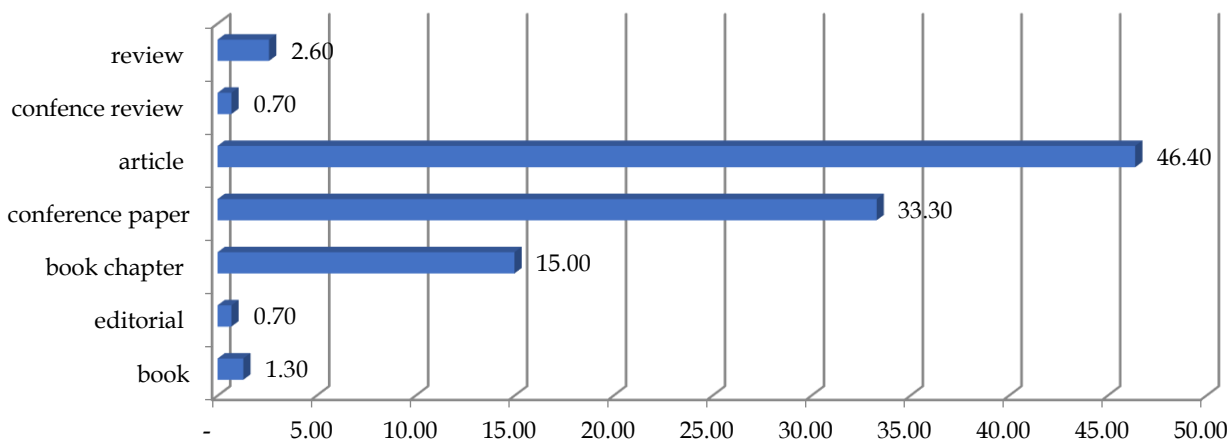


Figure 6. Document types on ethnosience from 2008-2023

Based on the types of articles above, it can be seen that research on ethnoscience is often found in the form of Articles (46.4%), Conference Papers (33.3%), Book Chapters (15.0%), Review Articles (2.6%), Books (1.3%), Conferences Review (0.7%), and Editorial (0.7%). This shows that the research authority is focused on the final paper article.

RQ:4 The Country's Most Prolific Ethnoscience Publications

The third question aims to identify the most productive countries in ethnoscience research from 2008-2023. The search results of 153 articles show that Indonesia is ranked first with the most productive country in publishing about ethnoscience with 74 identified documents. Then the second rank is followed by the United States with 28 documents, third is Brazil

with 10 documents, fourth is Canada with 9 documents, and fifth is France, Germany, Italy and the Russian Federation with 5 documents each. And finally, there are 4 Romanian documents and 3 Swedish documents.

Indonesia became the first productive country in publishing about ethnoscience. In general, research on ethnoscience is relatively new but gives special attention to researchers and academics in Indonesia to conduct research on ethnoscience. This may be supported by culture by Indonesia so that the opportunity to reconstruct cultural values into the reconstruction of pure science is relatively large. One of the efforts made in ethnoscience research is to integrate it into approaches, strategies, models, or learning methods. So it is not a common thing if ethnoscience research is domiciled by the State of Indonesia.

Table 1. Countries with the most ethnoscience publication documents from 2008-2023

| Country | Number of papers | Citation | Total Link Strength |
|--------------------|------------------|----------|---------------------|
| Indonesia | 74 | 256 | 3 |
| United states | 28 | 217 | 2 |
| Brazil | 10 | 45 | 1 |
| Canada | 9 | 131 | 3 |
| France | 5 | 33 | 0 |
| Germany | 5 | 55 | 4 |
| Italy | 5 | 62 | 3 |
| Russian federation | 5 | 2 | 0 |
| Romania | 4 | - | - |
| Sweden | 3 | - | - |

The 10 countries that made the best contribution on ethnoscience, when viewed from a minimum of 5 documents in possession, only 8 countries had 5 documents on ethnoscience. Indonesia became the first country with 256 citations in all citations, followed by the United States with 217 citations, Canada with 131 citations, Italy 66 citations, Germany 55 citations, Brazil 45 citations, France 33 citations, and the Russian

Federation with 2 citations. Even though Canada only has 9 documents, it has a higher citation rate compared to Brazil with 10 documents. Meanwhile, Romania and Sweden did not meet the requirements because under 5 documents published from 2008 to 2023. However, if seen from the total link strength value, Germany has the total link strength of other countries, followed by Indonesia, Canada, and Italy, United States and Brazil.



Figure 6. Countries with at least 5 ethnoscience publication documents from 2008-2023

Based on the picture above, it shows that the authority for research on ethnoscience is domiciled by the State of Indonesia, this can be seen from the bubbles that are formed. Selan Indonesia United States also made an extraordinary contribution related to Ethnoscience research. Then followed by several other contributing

countries such as the Netherlands, Germany, and Sweden.

RQ5: Affiliations That Often Publish About Ethnoscience

To answer the fifth question related to the contribution of Affiliations that contribute to publishing ethnoscience. This can be seen in the table below:

Table 2. Department/ Affiliation with the most ethnoscience publication documents from 2008-2023

| Affiliations | Country | Number of Papers | Percentage (%) |
|--------------------------------------|-----------|------------------|----------------|
| Universitas Negeri Semarang | Indonesia | 22 | 33.66 |
| University of Alberta | Canada | 9 | 13.77 |
| Universitas Negeri Surabaya | Indonesia | 7 | 10.71 |
| Universitas Negeri Padang | Indonesia | 5 | 7.65 |
| UniversitateaAlexandru Ioan Cuza | Romania | 4 | 6.12 |
| Universita Cattolica del Sacro Cuore | Italy | 4 | 6.12 |
| Universitas SebelasMaret | Indonesia | 4 | 6.12 |
| Universitas Negeri Yogyakarta | Indonesia | 4 | 6.12 |
| Universitas Jambi | Indonesia | 4 | 6.12 |
| Universitas Sultan AgengTirtayasa | Indonesia | 4 | 6.12 |

Based on the results of an analysis of 153 articles in the Scopus database, the institutions that contributed the most were from Indonesia, Universitas Negeri Semarang (UNNES) contributed 22 papers (33.66%), University of Alberta 9 papers (13.77%), Universitas Negeri Surabaya (UNESA) with 7 papers (10.71%), Universitas Negeri Padang (UNP) with 7 papers (7.65%). Meanwhile, if analyzed based on a minimum of 5 articles/documents with a minimum of 30 citations, the institutions that contributed the most were the 5 institutions consisting of UNNES, University of Alberta, UNESA, and UNP.

The search results of 153 articles show that Indonesia is ranked first with the most productive country in publishing about ethnoscience with 74 identified documents. Then the second rank is followed by the United States with 28 documents, third is Brazil with 10 documents, fourth is Canada with 9 documents, and fifth is France, Germany, Italy and the Russian Federation with 5 documents each. Indonesia became the first productive country in publishing about ethnoscience. In general, research on ethnoscience is relatively new but gives special attention to researchers and academics in Indonesia to conduct research on ethnoscience. This may be supported by culture by Indonesia so that the opportunity to reconstruct cultural values into the reconstruction of pure science is relatively large.

One of the efforts made in ethnoscience research is to integrate it into approaches, strategies, models, or learning methods. So it is not a common thing if ethnoscience research is domiciled by the State of Indonesia. The 10 countries that made the best contribution on ethnoscience, when viewed from a minimum of 5 documents in possession, only 8 countries had 5 documents on ethnoscience. Indonesia became the first country with 256 citations in all citations, followed by the United States with 217 citations, Canada with 131

citations, Italy 66 citations, Germany 55 citations, Brazil 45 citations, France 33 citations, and the Russian Federation with 2 citations. Even though Canada only has 9 documents, it has a higher citation rate compared to Brazil with 10 documents. Meanwhile, Romania and Sweden did not meet the requirements because under 5 documents published from 2008 to 2023. However, if seen from the total link strength value, Germany has the total link strength of other countries, followed by Indonesia, Canada, and Italy, United States and Brazil.

However, when viewed from research funding, it can be seen that most of the research on ethnoscience is domiciled by the *Canadian Institutes of Health Research*. Meanwhile, in Indonesia, funding for research on ethnoscience is financed by the Kementerian Riset dan Teknologi dan Pendidikan (KEMENRISTEKDIKTI), then partly from Universitas Negeri Yogyakarta (UNY) funds, and the Badan Penelitian dan Pengembangan Kementerian Pendidikan dan Kebudayaan Republik Indonesia. Funding support plays an important role in providing facilities and encouragement for publication considering the relatively high cost of publication. Thus, there is a need for special encouragement from the central government authorities to always provide encouragement in terms of publications.

The institutions that contributed the most were from Indonesia, Universitas Negeri Semarang (UNNES) contributed 22 papers (33.66%), University of Alberta 9 papers (13.77%), Universitas Negeri Surabaya (UNESA) with 7 papers (10.71%), Universitas Negeri Padang (UNP) with 7 papers (7.65%). Meanwhile, if analyzed based on a minimum of 5 articles/documents with a minimum of 30 citations, the institutions that contributed the most were the 5 institutions consisting of UNNES, University of Alberta, UNESA, and UNP. The greatest support regarding publication restrictions by the *Canadian Institutes of Health Research*. Meanwhile, in Indonesia, funding for research on ethnoscience is

financed by the Kementerian Riset dan Teknologi dan Pendidikan (KEMENRISTEKDIKTI).

RQ6: Authors With The Most Citations (2008-2023)

This sixth question answers the authors with the most citations during the 2008-2023 vulnerable period. Based on the search results of 153 articles, it can be seen in the table below:

Table 3. Authors with the most citations from 2008-2023

| Authors | Year | Citation | Percentage (%) |
|--|------|----------|----------------|
| Dahdouh-Guebas, F., Koedam, N. | 2008 | 61 | 93.33 |
| Wilder, B.T., O'Meara, C., Monti, L., Nabhan, G.P. | 2016 | 57 | 87.21 |
| Zidny, R., Sjöström, J., Eilks, I. | 2020 | 45 | 68.85 |
| Bernhardson, B.-M., Olson, K., Baracos, V.E., Wismer, W.V. | 2012 | 32 | 48.96 |
| Graffigna, G., Vegni, E., Barello, S., Olson, K., Bosio, C.A. | 2011 | 25 | 38.25 |
| Fasasi, R.A. | 2017 | 23 | 35.19 |
| Nader, L. | 2014 | 23 | 35.19 |
| Litsinger, J.A., Libetario, E.M., Canapi, B.L. | 2009 | 23 | 35.19 |
| de Macêdo, M.N.C., Dias, H.C.T., Coelho, F.M.G., de Souza, M.L.H., Silva, E. | 2013 | 21 | 32.13 |
| Sandu, I., Poruciuc, A., Alexianu, M., Curcă, R.-G., Weller, O. | 2010 | 19 | 29.07 |
| Fraser, K.D., Estabrooks, C., Allen, M., Strang, V. | 2009 | 19 | 29.07 |
| Dewi, C.A., Khery, Y., Erna, M. | 2019 | 18 | 27.54 |
| Parmin, Sajidan, Ashadi, Sutikno, Fibriana, F. | 2017 | 16 | 24.48 |

Based on the table above, it can be seen that the 5 best authors with the highest number of citations in the 2008-2023 publication period, namely Dahdouh et al. (61; 93.33%) in 2008 with the research title, then followed by Wilder, et.al (57; 87.21%), Monti, et al (45; 68.85%), Bernhardson, et al (32; 48.96%), Graffigna et al (25; 38.25%). Meanwhile, based on the distribution of articles with a minimum of 5 documents owned by the author and cited at least 10 times. If viewed from the point of view of the co-author with the acquisition of documents, it can be sorted based on the documents owned by the author, namely as follows (See Table 4).

Table 4. Author with the most documents from 2008-2023

| Authors | Number of papers | Percentage (%) |
|----------------|------------------|----------------|
| Sudarmin | 10 | 15.3 |
| Sumarni, W. | 10 | 15.3 |
| Olson, K. | 7 | 10.71 |
| Sudarmin, S. | 6 | 9.18 |
| Graffigna, G. | 4 | 6.12 |
| Mursiti, S. | 4 | 6.12 |
| Prahani, B. K. | 4 | 6.12 |
| Sandu, I. | 4 | 6.12 |
| Sarwi, S. | 4 | 6.12 |
| Zidny, R. | 4 | 6.12 |

Based on the table above, it can be seen that Sudarmin has 10 with a paper contribution percentage of 15.3%, and 6 other documents with a percentage of 9.18%, followed by Sumarni with 10 documents with a paper contribution percentage on ethnosience of around 15.3%. olson, K. with 7 papers with percentages ranging from 10.71%. Graffigna, G.; Mursiti, S.; Prahani,

B.K.; Sandu, I.; Sarwi, S.; Zidny, R. with each of the 4 papers produced with a percentage of 6.12%.

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Ethnosience-based learning is the latest research trend that must be facilitated by teachers to increase students' scientific literacy. Learning with ethnosience is believed to be able to improve students' high-order thinking skills because they are faced with social problems and issues that occur in the community environment. Scientific literacy ability according to (Facione, 2011) is a critical thinking ability in which students perform interpretation, analysis, inference, evaluation, explanation, and self-regulation.

Then Anderson and Krathwohl revised this taxonomy by classifying six cognitive processes, namely: remembering, understanding, applying, analyzing, evaluating, and creating (Marzano et al., 2009). Like the original framework, the new taxonomy assumes continuity underlying cognitive processes becomes more complex suggesting that indicators for measuring

higher-order thinking skills include analyzing, evaluating, creating (Krathwohl, 2002).

Ethnoscience-based learning is an alternative solution that can be used and taught in classrooms to improve students' conceptual understanding and scientific literacy of social issues. Ethnoscience can also be used to stimulate students' HOTS (Astalini et al., 2023; de Freitas et al., 2023; A Khoiri et al., 2021; Wartono et al., 2018), critical thinking and problem solving skills (Hikmawati et al., 2020; Kasi et al., 2021; Zidny & Eilks, 2022), creative and innovative thinking skills (Ahmad Khoiri et al., 2019; Wilder et al., 2016).

Conclusion

The dissemination of published articles related to ethnoscience began in 2019, then experienced a significant increase from 2020, and the peak occurred in 2021 with 32 publications on Scopus. Based on the research results, the Ethnoscience theme was then divided into 35 clusters. The ethnoscience research area is dominated by the study of social sciences (30.2%), physics (20.4%), others (10.2%), arts and humanities (9.3%) and several other research areas. The search results for 153 articles show that Indonesia is ranked first as the most productive country in publications on ethnoscience with 74 identified documents. The affiliates who contributed the most came from Indonesia, Semarang State University (UNNES) contributed 22 papers (33.66%), University of Alberta 9 papers (13.77%), Surabaya State University (UNESA) with 7 papers (10.71%), Padang State University (UNP) with 7 papers (7.65%). The 5 best authors with the largest number of sites for the 2008-2023 publication period, namely Dahdouh et al., (61; 93.33%) in 2008, then followed by Wilder et al. (57; 87.21%), Monti, et al (45; 68.85%), Bernhardson et al., (32; 48.96%), Graffigna et al., (25; 38.25%). Meanwhile, if seen from the number of documents published by the author, then Sudarmin has 10 documents with a contribution percentage of 15.3%, and 6 other documents with a proportion of 9.18%.

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Author Contributions

Noris: Conceptualizing research, designing, designing, collecting data, analyzing data, and compiling manuscripts. Misbahul Jannah: Revise the data, guide, and revise the manuscript. Indriyani: Revise the data, and revise the manuscript.

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