

LITERATURE REVIEW: ETHNOSCIENCE PROJECT IN SCIENCE LEARNING

Miranita Khusniati^{1,2*}, Sarwanto¹, Sri Yamtinah¹, Parmin²

¹Doctoral Program in Science Education FKIP Universitas Sebelas Maret, Indonesia

²Science Education Study Program FMIPA Universitas Negeri Semarang, Indonesia

* Corresponding email: miranita@student.uns.ac.id

ABSTRACT

Due to the importance of ethnoscience integration in the PjBL model, many studies have been conducted on this topic. To find out the development of research on this topic, a literature review is needed on the results of research that has been carried out. The purpose of this study is to find out the topics that are often studied in research related to ethnoscience projects in science learning, as well as the development of the research in question from 2015 to 2024. The research method used is descriptive research with a bibliometric approach. The data analyzed were 843 research articles that had been published in journals on Google Scholar data. Based on the literature review that has been carried out, it was found that many studies related to ethnoscience projects in Science Learning have been conducted since 2015 to 2024. In the early years, many studies were conducted through the reconstruction of indigenous knowledge in culture, in relation to the knowledge possessed by the community. More and more, research has begun to be conducted to seek learning through the integration of ethnoscience and PjBL to improve students' abilities, attitudes, and skills.

Keywords: ethnoscience, Project Based Learning (PjBL), *literature review*.

INTRODUCTION

Project Based Learning (PjBL) model is a learning model in which students are involved in real projects that include investigation, exploration, and application of knowledge in relevant contexts. In PjBL, students learn through practical experience, collaboration, and complex problem solving. Project Based Learning (PjBL) model is a learning model that provides opportunities for students to generate creative ideas that support the learning process with a product orientation (Blumenfeld et al., 1991).

PjBL provides a more authentic context for students, as they can see the real impact of their learning in their daily lives (Almulla, 2020; Boss & Krauss, 2022; Ghosheh Wahbeh et al., 2021; Silma et al., 2024). They learn to take responsibility, overcome failure, and learn from experience in facing project challenges (Hussein, 2021; Safitri et al., 2024).

The implementation of the PjBL model can be integrated by including local culture, or using an ethnoscience approach. The integration of ethnoscience in project-based learning is very important and urgent for several reasons. First of all, by including ethnoscience in project-based learning, we can address the gap in science teaching that often ignores local and traditional knowledge. Much knowledge and practices exist in the culture and traditions of communities that are not yet covered in the science curriculum (Claussen & Osborne, 2013; Lemke, 2001; Ziman, 1980). The integration of ethnoscience helps recognize and respect this local knowledge, and engages students in understanding the unique ways in which this knowledge is used and applied in their cultural context (El Yazidi & Rijal, 2024; Gondwe & Longnecker, 2015; Zidny et al., 2020).

In addition, ethnoscience integration also increases students' sense of ownership and connectedness to the learning material (Anane, 2023; Rahmawati et al., 2020). When students see that their own knowledge is recognized and valued in learning, they feel respected and more motivated to learn. This also helps increase the relevance of learning by linking it to students' daily lives and cultural contexts, so that they can see the value and benefits of what they are learning.

Due to the importance of ethnoscience integration in the PjBL model, many studies have been conducted on this topic. To find out the development of research on this topic, a literature review is needed on the results of research that has been carried out. The purpose of this study is to find out the topics that are often studied in research related to ethnoscience projects in science learning, as well as the development of the research in question from 2015 to 2024.

METHODS

The research method used is descriptive research with a bibliometric approach. Bibliometric analysis aims to measure the development of scientific article publications and scientific contributions (Liu et al., 2015) which consists of five stages (Setyaningsih et al., 2018). This aims to determine the pattern and frequency of citations of published articles. This bibliometric approach is carried out using the Publish or Perish (PoP) software which can retrieve and provide academic citations.

The data used in this study is Google Scholar metadata, which is then visualized using VOSviewer software. VOSviewer software can classify keywords into different groups (Setyaningsih et al., 2018). The stages of bibliometric analysis in this study are shown in Figure 1.

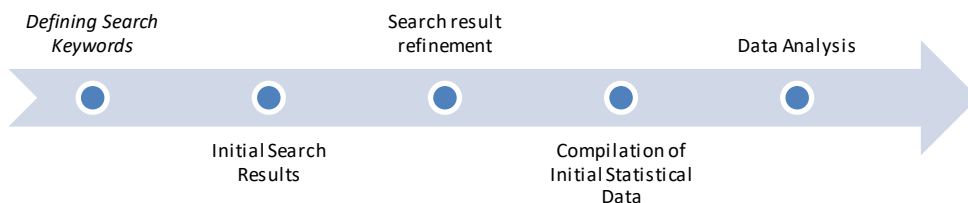


Figure 1. Stages of Bibliometric Analysis

Defining Search Keywords

The metadata search was conducted in July 2024 with the keyword “Ethnoscience Project in science learning”. Metadata collection was carried out on the Google Scholar database using Publish or Perish (PoP) software.

Initial Search Results

The metadata period of the articles is 2015-2024. The keywords used are limited to “Ethnoscience Project in science learning” only in research journals. There are 998 articles sourced from the Google Scholar database. All metadata obtained is stored in RIS format. It is able to fully store the data obtained.

Search result refinement

All submitted articles were manually screened. Articles that were not journal articles such as books or seminar proceedings, as well as reviewed journal articles were not included. The criteria for selecting articles were the keywords "Sustainable Development Goals in science learning" and the suitability of the abstract and title. The suitability of both ethnoscience and the

project-based learning model is explicitly seen in the title or contained in the contents of the article.

Preparation of Initial Statistical Data

Data ready for analysis was obtained, namely 843 articles to be displayed in the analysis.

Data Analysis

All metadata outputs that have been selected and analyzed are then displayed by the VOSviewer software which provides three map visualizations, namely network visualization, overlay visualization, and density visualization. VOSviewer can work efficiently with large data sets and provide various attractive and clear visual analyses (Liu et al., 2015).

RESULTS AND DISCUSSION

Research Topics on ethnoscience projects in Science Learning

Based on the results of the bibliometric analysis, a description of the research topics on the theme of ethnoscience projects in Science Learning is obtained, which is shown in Figure 2. In the form of density visualization, it can be seen in Figure 3.

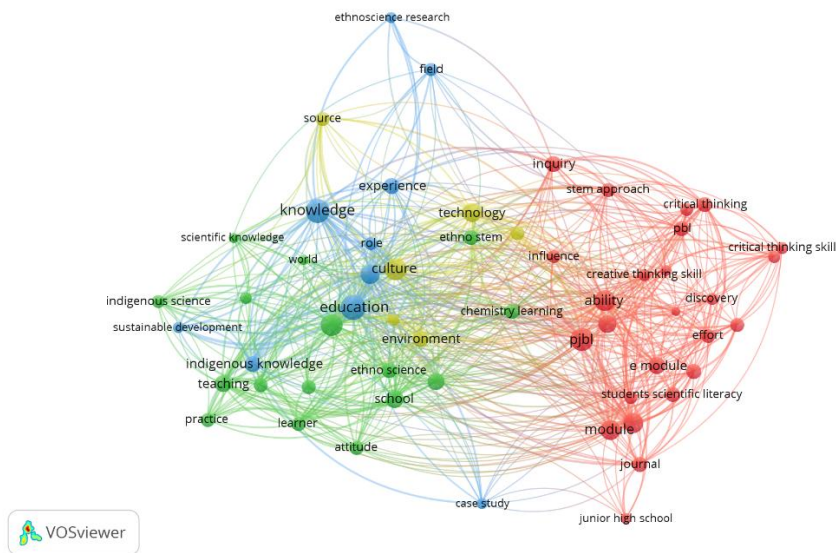


Figure 2. Network Visualization in Research of Ethnoscience Projects in Science Learning

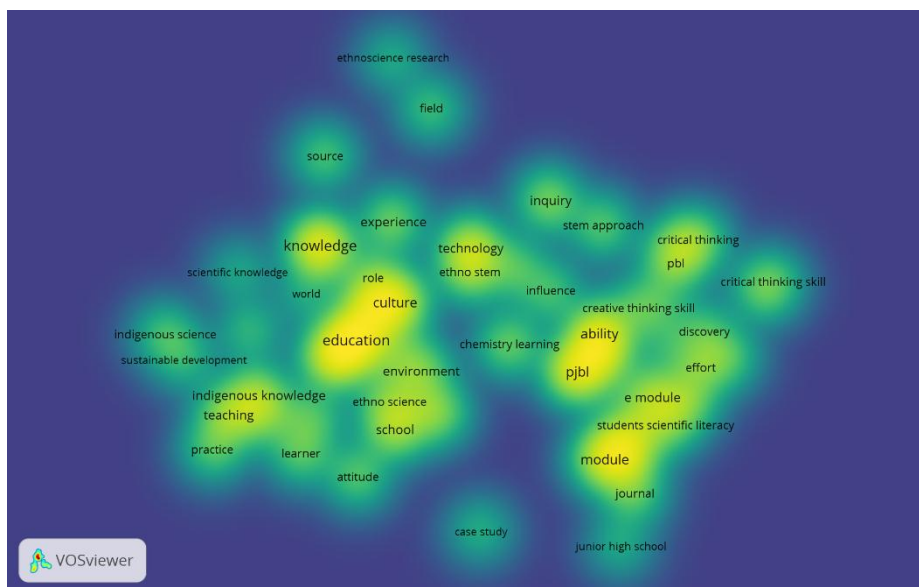


Figure 3. Density Visualization in Research of Ethnoscience Projects in Science Learning

Figure 2 shows that research related to ethnoscience projects in Science Learning has been widely conducted in the last 10 years with various sub-themes. It can be seen that the integration of both has a great influence on variables that need to be improved, such as critical thinking, science literacy, and those related to student attitudes. Not only that, this integration is also associated with sustainable development and the environment.

In relation to the research topic or theme related to ethnoscience projects in Science Learning, important findings are also presented in several articles with the highest citations (Table 1).

Table 1. Important Findings in the Highest Citation Articles

No	Number of citations	Researcher	Findings
1	362	Sumami & Kadarwati, 2020	The ethno-STEM project-based learning showed a significant effect on the improvement of students' critical and creative thinking skills.
2	233	Ramdani et al., 2021	The applying science teaching material with 5E integrated by local wisdom positively affects students' critical thinking skills.
3	176	Dewi et al., 2019	The development of scientific literacy needs to be done by focusing on the preparation of future generations of scientific literacy with curriculum content that pays attention to culture and daily life to make it more contextual.
4	167	Damayanti et al.,	The ethnoscience integrated science learning model is

		2017	suitable for use in the learning process, and can improve student learning outcomes and students' creative thinking abilities.
5	156	Fasasi, 2017	The results obtained were that ethnoscience instruction promoted learners' attitude to science. Therefore, its use in educational instruction, especially among traditional science learners, should be explored.

Table 1 shows that research related to ethnoscience projects in Science Learning has been widely conducted, especially in improving students' abilities, attitudes and skills. Various recommendations are given so that culture can be included in science learning, one of which is through a project-based learning model.

Research Development of ethnoscience projects in Science Learning from 2015 to 2024

In addition to visualizing frequently occurring research themes or topics, VOSviewer is also able to visualize the development of ethnoscience projects in Science Learning research from year to year. An overview of the development of research related to the theme from 2015 to 2024 can be seen in Figure 4.

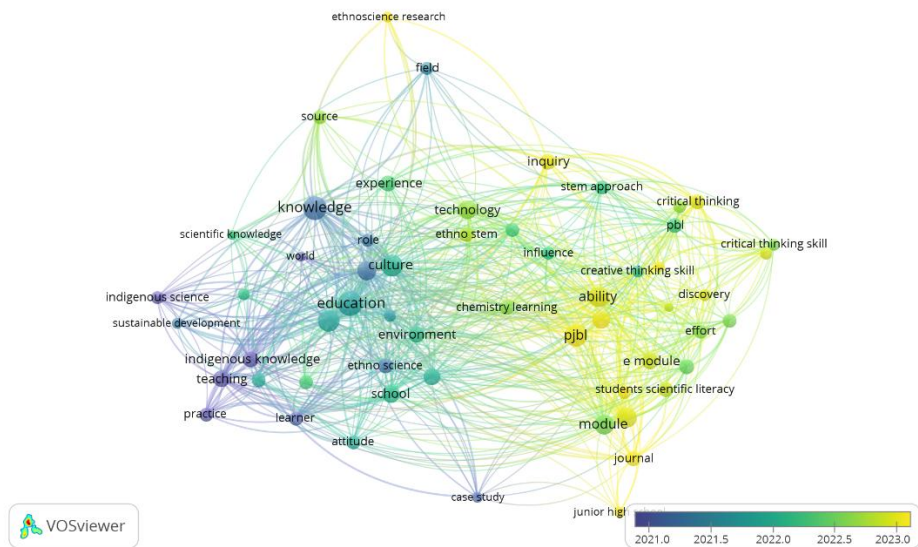


Figure 4. Overlay visualization of ethnoscience projects in Science Learning from 2015 to 2024

Figure 4 shows that from 2015 to 2024, research related to the integration of ethnoscience in PjBL is still widely conducted. It can be seen that in the early years, much research was conducted through the reconstruction of indigenous science in culture, its relationship with the knowledge possessed by the community. Increasingly, research has begun to be conducted to strive for learning through the integration of ethnoscience and PjBL to improve students' abilities, attitudes and skills. This shows that the trend of ethnoscience research in relation to PjBL is still being pursued to improve these three things.

The various findings above show that learning by integrating ethnoscience into the PjBL model is able to improve students' abilities (Hidayah et al., 2024; Rosita et al., 2024), attitudes (Rahmawati et al., 2020) and skills (Anggrella & Sudrajat, 2024; Babalola & Keku, 2024; Hidayah et al., 2024; Rahayu & Indriyanti, 2023). Therefore, it is necessary to develop learning that integrates ethnoscience and PjBL with detailed steps, which show that the existing culture is truly integrated in learning.

CONCLUSION

Many studies related to ethnoscience projects in Science Learning have been conducted since 2015 to 2024. In the early years, many studies were conducted through the reconstruction of indigenous knowledge in culture, in relation to the knowledge possessed by the community. More and more, research has begun to be conducted to seek learning through the integration of ethnoscience and PjBL to improve students' abilities, attitudes, and skills. This shows that the tendency of ethnoscience research in relation to PjBL is still being pursued to improve these three things.

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