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ETHNOSCIENCE ANALYSIS IN SCIENCE LEARNING IN PRIMARY SCHOOLS (ELEMENTARY SCHOOL)

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Abstract

Students' awareness of Indonesian culture and traditional knowledge has declined as a result of globalization, Ethnoscience is a teaching strategy that combines conventional wisdom with contemporary ideas. It is considered an efficient teaching method, especially when it comes to teaching science in elementary schools. This research was conducted in three elementary schools located in Mataram City, West Nusa Tenggara, while the elementary schools that became the research sites were SD Negeri 15 Mataram, SD Negeri 19 Mataram, and SD Negeri 20 Mataram. The type of research used is Descriptive Qualitativ. The samples in this research are 4th and 5th grade teachers with a total of 6 teachers. The results of the study state that ethnoscience-based science learning design can be applied to several science learning materials, the application of ethnoscience-based science learning has gone well. Each school conducts evaluation activities with the aim of being a forum for teachers to convey complaints and opinions related to ethnoscience-based learning.

Keywords: *Ethnoscience, Local Wisdom, Science Learning*

1. Introduction

The goal of Merdeka Curriculum is to develop a science curriculum that incorporates traditional or local knowledge while remaining inclusive, varied, and relevant to society. It emphasizes differentiated learning according to students' potential and local situations, as well as essential and contextual materials. To ensure that students acquire knowledge from traditional or local knowledge in a way that can be applied in everyday life (Putri, 2022). Self-directed learning and local knowledge are essential for fostering student independence, according to Hasibuan (2022). By emphasizing student qualities and recognizing the diversity of knowledge within communities, ethnoscience can help facilitate this. By making connections between abstract science concepts and students' everyday experiences, this method-which is specifically used in the Merdeka Curriculum aims to enhance learning for students and provide a more fulfilling educational process.

The Merdeka Curriculum's emphasis on experiential learning and student participation is reflected in the importance of ethnoscience. Students get the opportunity to investigate and experience science concepts firsthand through teaching strategies that prioritize field observations, experiments and direct engagement with the natural environment. For example, cultivating and caring for plants in the classroom can help students learn about traditional medicinal plants (Asra, 2021). Students' awareness of Indonesian culture and traditional knowledge has declined as a result of globalization, which also reduces their sense of nationality. The next generation of the nation must be familiarized to appreciate local culture and wisdom, and this can only be achieved by incorporating cultural knowledge into the educational process. The surrounding environment, local wisdom, and regional culture can all enhance students' educational experience. ethnoscience learning can also contribute to character development and appreciation of local culture (Hadi, 2019).

Ethnoscience is a constructivist approach to studying culture that emphasizes meaningful learning. This approach is based on the idea that students can discover, transform and compare new material by using pre-existing principles of analysis. (Pertiwi, 2019). Ethnoscience is knowledge acquired by a particular culture or group as a system of

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knowledge and cognition that is unique to that particular culture. The word is formed from the words ethnos (country) and scientia (knowledge). Ethnoscience, which includes linguistic, cultural, moral and technological knowledge, is a major emphasis of education in Indonesia. This method is very important for education because it expresses and communicates the evolution of knowledge in a society. (Ningrum, 2018).

Ethnoscience is a teaching strategy that combines conventional wisdom with contemporary ideas. It is considered an efficient teaching method, especially when it comes to teaching science in elementary schools. This all-encompassing method provides ample opportunities for additional study and investigation while assisting students in understanding local phenomena. Ethnoscience is applied to develop a culturally integrated learning environment. Using real objects from the environment as learning tools, concept mastery and science process skills are the main objectives of ethnoscience-oriented learning, which focuses on local cultural knowledge and practices. This method presents local knowledge contextually and uses it as a source and object of learning (Akmal, 2020). Educators are encouraged by ethnoscience to teach science with an emphasis on social issues, cultural norms and local knowledge. With this method, students are better able to understand and apply the science they learn in the classroom to real-world issues. The educational process, with its procedures, approaches, materials, and methodologies, makes ethnoscience more recognizable. Ethnoscience education methods include cultural knowledge found in fairy tales, music, games, traditional houses, rituals, local production, and the use of nature. Identification with ethnoscience is essential for learning about local cultural knowledge (Wahyu, 2017).

The integration of ethnoscience into science learning in elementary schools can only be successful with appropriate teaching materials. These materials need to be specifically designed to link traditional knowledge with scientific concepts, while considering the cognitive capacities and learning preferences of easier students. Ethnoscience can be integrated into learning, in accordance with research conducted by Fahrozy (2022) learning can be successful by incorporating ethnoscience because local culture-based learning is more effective and relevant for students, Rahayu et al. (2015) observed that this learning provides better results. A method to build a learning environment and develop experiences that integrate culture for implementation into learning. According to Sumarni et al. (2016), ethnoscience-based science learning is a method that incorporates traditional knowledge or local community knowledge into natural science learning, which recognizes the importance of cultural information in understanding scientific concepts taught at school.

Najib (2018: 99) states that the method of making roof tiles in Jepara can be used as an integrated science learning resource on heat and temperature. This is just one example of ethnoscience studies in science education. Perwitasari et al. (2016) investigated the impact of fish smoking in Demak on students' science literacy on energy shifts using ethnoscience-based learning. They found that the diversity of Indonesian students can be supported by incorporating local community knowledge into science education. The idea of "Merdeka Belajar" allows educators and learners to modify teaching to suit local conditions. Integrating ethnoscience into the primary school curriculum is important as it promotes the development of children's operational cognitive skills. It keeps children from getting confused with what they understand and allows them to use experience as a reference. Students need to be taught to embrace local culture to preserve it. Schools can build passion for local culture and foster closer ties with the community by incorporating ethnoscience and cultural knowledge (ethnos) into the educational process (Thaniah, 2020).

In Indonesia, the goal of ethnoscience education is to foster a love for culture and its people, broaden students' understanding of the local way of life, and help them overcome their inability to understand abstract concepts. It offers students challenging learning experiences that are based on real-world situations. It fosters a sense of nationalism and a

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greater awareness of the potential of their region by increasing the value of local expertise and nationalism in the area.

Ethnoscience-based learning has many advantages such as being able to encourage students to investigate, develop critical and analytical thinking, and collaborate to find solutions to problems, therefore the author is interested in conducting research with the title Ethnoscience Analysis In Science Learning In Primary Schools (Elementary School).

2. Method

This research was conducted in three elementary schools located in Mataram City, West Nusa Tenggara, while the elementary schools that became the research sites were SD Negeri 15 Mataram, SD Negeri 19 Mataram, SD Negeri 20 Mataram. The type of research used is Descriptive Qualitative, the purpose of this theory-based qualitative research approach is to find problems and confirm research results using empirical data through experts, or conversations about the research including human experience. Studying or describing something, including human behavior, is the main emphasis of descriptive research. (Wati, 2023). The purpose of this study is to analyze ethnoscience and science learning in elementary schools. The sample in this research is 4th and 5th grade teachers with a total of 6 teachers, the sample was taken using purposive sampling technique. Interview, observation and documentation methods are data collection techniques used by researchers. The data analysis technique is by collecting, reducing, presenting, and drawing conclusions from the data.

3. Results and Discussion

Ethnoscience-Based Science Learning Design

Utilizing regional myths, legends, and customs, the ethnoscience-based science learning system acquaints students with scientific ideas. In order to comprehend the link between contemporary science and traditional knowledge within their cultural context, students do community-based research and work with local leaders. While honoring traditional knowledge, this method encourages a better comprehension of science and opens up the conversation on the morals and ethics of science as well as its effects on the environment and society.

The results of the study state that ethnoscience-based learning designs at SD Negeri 15 Mataram, SD Negeri 19 Mataram, and SD Negeri 20 Mataran can only be applied to certain materials. In grade 4 science subjects, the materials that can be applied for Ethnoscience-based learning are materials with plant themes, stories about regions, and Indonesian culture. As for grade 5, the material that can be integrated with ethnoscience-based learning is material with the theme of ecosystems and the wealth of Indonesia. Research conducted by Puspasari (2019) using an ethnoscience approach in science education may be quite successful. This method allows the integration of scientific information with the context of students' daily lives by linking scientific concepts into local knowledge or cultural practices by linking scientific ideas with the surrounding environment, customs, or past knowledge of students, the ethnoscience approach can be used to teach science topics in the context of science learning in elementary schools. For example, teaching about plants allows students to learn about the structure and function of plants as well as their applications in traditional medicine and other aspects of daily life.

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The results of the study explain the application of ethnosians in science learning in grades 4 and 5 at SD Negeri 15 Mataram, SD Negeri 19 Mataram, and SD Negeri 20 Mataran in terms of three aspects, namely lesson plans, teaching materials, and student exercise questions, shown in table 1 below.

table 1. the application of ethnocentrism in science learning in terms of three aspects: lesson plans, teaching materials, and practice questions.

School Name	Ethnoscience-based lesson plan	Ethnoscience-based Teaching Materials	Ethnoscience-based exercise questions
SDN 15 Mataram	Available	Available	Available
SDN 19 Mataram	Unavailable	Unavailable	Available
SDN 20 Mataram	Available	Available	Available

Based on table 1, it can be seen that science learning at SDN 15 Mataram has available lesson plans, teaching materials and practice questions based on ethnoscience, at SDN 19 Mataram lesson plans, teaching materials have not been based on ethnoscience and for ethnoscience-based practice questions are available, while SDN 20 Mataram has used ethnoscience in lesson plans, teaching materials and practice questions.

The Learning Implementation Plan (RPP) for Ethnoscience-based Learning is a method for creating lessons that incorporate scientific information with traditional knowledge or cultural practices. With this method, the values, knowledge, and customs of a certain civilization are to be integrated with scientific notions. Teaching with ethnoscience-based lesson plans takes into account the local knowledge of a community in addition to global scientific ideas and concepts. In order to preserve and honor the cultural legacy and knowledge present in their surroundings, it is important to provide kids with the opportunity to get a better comprehension of science.

Students' level of understanding and the local cultural environment are taken into account when creating ethnoscience-based science teaching resources for elementary school students. Through the use of myths, folklore or local customs - such as stories about the water cycle - these resources convey scientific ideas. Students can also connect scientific ideas to practical experiences by conducting experiments relevant to everyday life. These resources also encourage collaboration with local leaders or experts, enhancing education through multiple perspectives and showing how contemporary science and traditional knowledge are interconnected (Andayani, 2021)

Ethnoscience-based practice questions integrate local knowledge and cultural context to improve students' comprehension of scientific subject. In addition to emphasizing general information, these questions also take into account cultural, traditional, or local knowledge that is pertinent to the subject matter being examined. By allowing children to connect scientific ideas to their surroundings, they enhance their comprehension while honoring their cultural background. Through the incorporation of elements of regional culture, these practice questions enhance the educational process.

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Implementation Of Ethnoscience-Based Science Learning

Implementing ethnoscience-based science learning means teaching students about scientific ideas while incorporating local knowledge or customs. Students can learn more deeply and gain an appreciation of the cultural diversity around them when ethnoscience-based science learning is used. Students can study science within their cultural environment through the integration of scientific knowledge with regional values, customs, and traditions through ethnoscience-based science education. Curriculum covers local myths and folklore as well as pertinent scientific examples. In order to make the science they have learnt applicable to real-world situations, students are encouraged to carry out research on local issues. In addition to promoting inclusive learning and helping students realize how important it is to preserve traditional knowledge while learning contemporary science, collaboration with local experts and communities allows for a two-way knowledge exchange between traditional and modern science.

The results of the Ethnoscience-based science learning research for grades 4 and 5 at SD Negeri 15 Mataram, SD Negeri 19 Mataram, and SD Negeri 20 Mataran can be seen in the following table

Table 2. Application of ethnoscience-based science learning

No	Ethnoscience-based Learning	Place of Implementation	Class	Learning Theme
1	Utilization of traditional plants as medicine	SD Negeri 15 Mataram	4	Plants
2	Identify existing plants and learn how they are used in everyday life.	SD Negeri 20 Mataram	4	Plants
3	regional stories that involve the relationship between humans and nature, especially plants.	SD Negeri 15 Mataram	4	Stories About the Region
4	Students study typical arts or crafts from a region. learn about the materials used, manufacturing techniques, as well as the cultural values contained in each work of art.	SDN 20 Mataram	4	Indonesian Culture
5	Utilization of livestock as traditional agricultural tools	SD Negeri 15 Mataram, SD Negeri 19 Mataram	5	Ecosystem
6	Students Learn about protected animals	SDN 19 Mataram	5	Ecosystem
7	Studying the metamorphosis of butterflies and integrating it with butterfly dance from bali	SDN 20 Mataram	5	Ecosystem
8	Students identify and study animals endemic to Indonesia. They can also research how local communities protect and conserve these animals	SDN 20 Mataram	5	Indonesia's Wealth

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based on their local wisdom.

Based on table 2, it can be seen that ethnoscience-based science learning on the theme of plants can be integrated by utilizing plants as traditional medicine, this is in line with research conducted by Senjawati (2020) that scientific knowledge can be integrated with traditional plant knowledge from certain communities or ethnic groups through ethnoscience-based learning with plant material. Plant-based ethnoscience education can improve students' scientific understanding while helping them appreciate and understand the importance of local knowledge in preserving biodiversity and the environment.Based on the research results, ethnoscience-based science learning on the theme of regional stories can be integrated by involving human relationships with nature, especially in plants. Ethnoscience encourages science teaching based on culture, local wisdom, and community issues. This method provides more meaningful science lessons by letting students apply what they have learned to real-world problems (Nuralita, 2020).

Based on the results of research on regional culture can be integrated with Ethnoscience learning, namely by studying the arts or crafts typical of a region. learning about the materials used, manufacturing techniques, and cultural values contained in each work of art. Students' appreciation of local culture can be fostered by doing activities in the classroom, for example the scientific method for making plaits from palm leaves begins with drying the leaves until the desired shape is achieved (Setyowati, 2023). Furthermore, based on the results of the study, it is known that ethnoscience-based science learning can be integrated into learning with the ecosystem theme of the Indonesian wealth theme. The diversity of regional cultures that combine local culture with ecosystems is what makes the environment of Indonesian society so unique. Native wildlife, local cuisine, nature conservation, traditional dances, and tourism are aspects of civilization (Melawati, 2022).

A comprehensive selection of learning resources, including the environment, literature, audio-visual aids and the internet, is necessary for ethnoscience-based theme learning. In addition to using books and the internet to enhance learning, teachers can use multimedia, such as movies and modules, to accelerate the teaching process. Based on the interview results, it is found that teachers have utilized learning resources well.

Evaluation Of Ethnoscience-Based Science Learning Implementation

Based on the results of interviews with teachers at SD Negeri 15 Mataram, SD Negeri 19 Mataram, and SD Negeri 20 Mataran, each school conducts evaluation activities every month. The purpose of the evaluation is as a forum for teachers to convey aspirations complaints and opinions related to ethnoscience-based learning, The use of ethnoscience in Makassar is one of the learning strategies that can be explored, studied, and practiced. Given that students will more easily understand content from their daily lives and Makassar culture when ethnoscience is used.

Ethnoscience-based science education is evaluated based on how well it integrates scientific knowledge with the customs, values, and local values of the pupils. This involves determining how applicable information is to students' everyday situations and piqueing their curiosity about science. The assessment also takes sustainability, cooperation with local experts, and student participation with instructional strategies into account. Evaluating how well this strategy maintains local knowledge while incorporating contemporary science without undermining cultural values is the aim of attaining inclusive, relevant, and sustainable learning objectives.

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4. Conclusion

Based on the results of data analysis of the research that has been done, it can be concluded that Ethnoscience-Based science Learning Design at SD Negeri 15 Mataram, SD Negeri 19 Mataram, and SD Negeri 20 Mataram, for grade 4 can be applied with the theme of plants, stories about the region, and Indonesian culture. As for grade 5, the material that can be integrated with ethnoscience-based learning is material with the theme of ecosystems, and Indonesian wealth. The implementation of Ethnoscience-based science learning has gone well because teachers teach students about scientific ideas while incorporating local knowledge or customs. Each school conducts evaluation activities every month. The purpose of the evaluation is as a forum for teachers to convey aspirations complaints and opinions related to ethnoscience-based learning,

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