

Analysis Teacher Understanding on Based Ethnoscience Basic Learning

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Submission date: 10-Jul-2023 07:41AM (UTC+0700)

Submission ID: 2128726230

File name: 9._Analysis_Teacher_Understanding_On.pdf (679.08K)

Word count: 4444

Character count: 25881



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Received: 01-06-2022; Revised:15-06-2022 ; Accepted: 31-10-2022

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Abstract: Development of the globalized world of the 21st century brings many changes, especially advances in the world of education. Ethnoscience-based learning is an innovation that integrates local wisdom as a learning resource to achieve learning objectives. Teachers can connect local wisdom possessed by students and then link it to science learning materials so that learning will be more meaningful and fun. The purpose of this study was to determine the extent of teachers' understanding of ethnoscience-based learning and its application as a learning resource in learning in elementary schools. The sampling technique was purposive sampling from 8 elementary schools, Kaliwungu Kendal. Data were collected by interview, observation and documentation and analyzed by qualitative descriptive method. results of data analysis from 8 resource persons, it shows five from eight teachers have not understood specifically about ethnoscience-based learning, and all teachers have used internal ethnoscience as a learning resource. However, of the 8 teachers, only 3 teachers wrote ethnoscience-based learning designs in the lesson plan. This study aims to determine the skills of teachers in ethnoscience-based learning management.

Abstrak: Perkembangan dunia global abad 21 membawa banyak perubahan, terutama kemajuan dalam dunia pendidikan. Pembelajaran berbasis etnosains merupakan inovasi yang mengintegrasikan antara kearifan lokal sebagai sumber belajar untuk mencapai tujuan pembelajaran. Guru dapat menghubungkan kearifan lokal yang dimiliki oleh peserta didik kemudian dikaitkan dengan materi pembelajaran IPA sehingga pembelajaran akan lebih bermakna dan menyenangkan. Tujuan penelitian ini adalah untuk mengetahui sejauh mana pemahaman guru terhadap pembelajaran berbasis etnosains dan penerapannya sebagai sumber belajar dalam pembelajaran di Sekolah Dasar. Teknik pengambilan sampel dengan secara purposive sampling, sebanyak 8 Sekolah Dasar di Kaliwungu Kendal. Data dikumpulkan dengan wawancara, observasi dan dokumentasi dan dianalisis dengan metode deskriptif kualitatif. Berdasarkan wawancara, observasi dan dokumentasi hasil analisis data dari 8 orang narasumber menunjukkan bahwa lima orang guru belum memahami secara spesifik tentang pembelajaran berbasis etnosains, dan semua guru telah memanfaatkan etnosains dalam sebagai sumber belajar. Namun, dari 8 orang guru baru 3 orang guru yang menuliskan rancangan pembelajaran berbasis etnosains dalam RPP. Penelitian ini bertujuan untuk mengetahui keterampilan guru dalam pengelolaan pembelajaran berbasis etnosains.

Keywords: Analysis of teacher understanding, elementary school teachers, ethnoscience, local wisdom.

INTRODUCTION

The Advances in telecommunications in the 21st century, facilitate access to the outside world wide open (Burns, 2018). This certainly makes it easier for many foreign cultures to enter Indonesia. Various cultures and knowledge are very easy to obtain and learn by all levels of society, including students, this is a special concern for developing countries. The progress of foreign cultures is the main attraction for students, many of whom admire and learn more modern foreign cultural mindsets (Kurniaman & Noviana, 2017). Education is very important to prepare quality of human resources, for that there need a direction and guidance in the inclusion of various information, especially in the world of education (Ariningtyas et al., 2017)

At this time, students know more about foreign cultures than their own regional culture (Utami & Murti, 2019). Currently, it is easier to obtain information about foreign cultures than the local culture itself, due to the lack of literacy in Indonesia's very diverse regional culture. So that students are more interested in exploring and seeking information about foreign cultures. This is indicated by the low knowledge of students on regional culture, resulting in a low sense of nationalism. To instill the noble culture of the nation, it can be started from the world of education, by integrating local culture with learning materials (Hikmawati et al., 2020)

Through education, it is necessary to prepare children to be ready to face the challenges of the global world and the free market. The 2013 curriculum has integrated national culture into learning materials in elementary schools (Kurniaman & Noviana, 2017). There are developments and innovations in various components of education, including the implementation of learning. There needs to be good planning and preparation to create an active, interesting and fun learning atmosphere for students so that all their potential can develop to the fullest. In building character education, it is necessary to instill religious

spiritual education, personality or character, academic intelligence and life skills (Shofiyah et al., 2020). The development of science and technology affects all areas of life, including education. Education must keep up with the times, and innovate to be more advanced and modern (Kim & Kim, 2021).

Ethnoscience is an innovation of education, which links local culture as a source of learning in learning materials to face global challenges (Wibowo & Ariyatun, 2020). Ethnoscience Using local wisdom that is very close to the daily lives of students in delivering learning materials.

Ethnoscience-based learning is characterized by several characteristics including presenting cultural topics related to science, reconstructing local science that exists in society into scientific science, developing understanding and deepening concepts, and using knowledge and skills through exploration activities using a scientific approach (Lubis et al., 2021).). The teacher connects the local culture or indigenous knowledge in the community with scientific knowledge (Mardianti et al., 2020).

According to Perwitasari et al. (2017) ethnoscience presents natural science learning materials by connecting social, cultural and community customs with scientific knowledge. Combining subject matter with the culture or habits of the community is expected to be more easily accepted and remembered by students (Zahro, 2019). There have been many previous studies discussing ethnoscience to increase the effectiveness of student learning.

The application of ethnoscience-based learning fosters the curiosity and activeness of students in finding information related to the material they are studying. Ethnoscience can foster a sense of pride in the culture of local wisdom and increase students' understanding of the potential of the area they have (Nuralita, 2020). Ethnoscience becomes a real medium of an abstract concept so that it is easy for students to

absorb and understand. Ethnoscience learning which is contextual learning helps students to find out, train critical and analytical thinking, and train students to solve the problems they face (Suryani, 2018). According to (Toledo-Sandoval, 2020) local culture needs to be discussed in the material along with the knowledge being studied, so that intercultural reflection can facilitate the delivery of knowledge better.

Teachers as educational facilitators should make maximum use of ethnoscience as a learning resource for students' science learning. However, based on observations and interviews conducted with 8 elementary school teachers in the Mawardi Cluster, Kaliwungu District, Kendal Regency, these 8 teachers do not yet know what ethnoscience is. However, some teachers have used local cultural wisdom as a source of learning scientific literacy in learning.

Teachers do not yet understand what ethnoscience is, but have used ethnoscience as a learning resource for students. This encourages the author to dig deeper, the more detailed objectives of this article are (1) to find out the teacher's understanding of ethnoscience, (2) to find out the use of the application of ethnoscience as a learning resource by elementary school teachers, and (3) to find out planning learning innovations in the lesson plans. So that concrete and in-depth information can be obtained regarding teachers' understanding of ethnoscience, application of examples of its use in scientific literacy in elementary schools and lesson planning.

METHOD

The research design is a qualitative descriptive research design directed at analyzing teachers' understanding of ethnoscience, the application of ethnoscience, and the use of ethnoscience as a source of student learning (Heriyanto, 2018). This qualitative research emphasizes more on descriptive exposure which is shown to describe or describe existing phenomena, both scientific phenomena or human engineering. This research examines

forms, activities, characteristics, changes, relationships, similarities and differences with other phenomena. In qualitative research, researchers attend directly to the field with the aim of obtaining accurate data.

The subjects in this study were elementary school teachers in the Mawardi Group, Kaliwungu District, Kendal Regency, who have heterogeneity and different learning environments, but with the same local culture. Respondents in this study using purposive sampling were fifth from eight elementary teacher in the Mawardi cluster. The method used is interviews, observation, and documentation is a data collection technique used by researchers. Validation of data using triangulation of sources and techniques. While the data analysis technique is by collecting, reducing, presenting, and drawing conclusions of the data.

RESULTS AND DISCUSSION

Based on interviews and open questionnaires, most teachers do not understand what local wisdom-based learning is. They better understand and often apply contextual-based learning, namely learning that is connected to the surrounding environment. So far, teachers only use frequently used methods such as PJBL, PBL, Discovery, and Inquiry in science learning.

Sudarmin (2014: 17) states that ethnoscience emphasizes on the culture of the social situation faced which refers to the values and norms that are prohibited or allowed as well as technology development. This research examines the application of ethnoscience in the learning process that is applied by the teacher

In the implementation of ethnoscience-based learning, it is obtained through student-centered learning methods, namely through exploration and discovery activities. The application of ethnoscience in learning is adjusted to the principles of education in a cultural context in primary schools. Learning in elementary schools that is compatible with the application of ethnoscience are science learning themes

Local wisdom education itself can train students to have a sense of care and responsibility in maintaining, utilizing, and preserving the environment and culture so that in one step, the teacher can instill cultural and scientific values, as expressed by (Wafiqni & Conscience, 2019). Through culture-based learning, it is hoped that students will find it easier to solve everyday problems. Solving problems is one of the skills it must master in today's era (Helmon & Sennen, 2020). Teachers in the Mawardi Group were enthusiastic when filling out questionnaires. They asked what ethnosience was and searched on the Google page to answer their curiosity. The term ethnosience is foreign to local teachers. Therefore, according to them, ethnosience is something new. As educators, it is a shared responsibility to prepare students to face the global era. One of the efforts that can make is to present a learning based on local wisdom so that students can face the entry of global culture while maintaining the nation's originality (Utari et al., 2016).

In the application of ethnosience learning the teacher needs to examine the basics and then explore cultural activities in the surrounding environment that are appropriate in the application of the learning, the teacher also needs to develop learning steps so that the delivery of material can be maximized, besides that the application of ethnosience learning gives students the opportunity to explore their knowledge in applying learning in daily.

The author tries to present the question by presenting examples of ethnosience in the Kaliwungu area to make it easier for respondents to understand. Like the culture of the Kaliwungu people, they make a special dish of milkfish jerky by utilizing sunlight. Teachers are used to presenting solar thermal energy in drying clothes and farmers drying rice. Many people in Kaliwungu also make tape and tempeh, which use the mushroom fermentation process in their manufacture. Integrative thematic 2013 curriculum learning involves

students in the learning process to gain knowledge through direct experience and discover the knowledge they learn for themselves. Thematic learning has a goal so that students have memorable experiences to be more easily absorbed and understood by students (Khoeriyah & Mawardi, 2018).

A total of 6 teachers did not understand ethnosience-based learning or local wisdom. In their opinion, ethnosience learning is the same as contextual learning. However, there is a difference between ethnosience-based learning and contextual learning. Contextual learning tends to apply learning resources in the environment around students, while ethnosience is more specific in using culture as a science learning resource. Ethnosience presents learning using a local culture owned, trusted, and preserved by the community associated with appropriate learning materials. Almost all teachers have used canned telephones as a learning resource in sound learning. However, they do not understand that the application of canned telephones is included in ethnosience-based learning or local wisdom. From the interviews with eight teachers in the Mawardi Group, three teachers already know about learning by utilizing local wisdom. However, as many as five teachers do not understand what learning is using local wisdom. They tend to teach by referring to thematic books from the ministry of education and do not make modifications in the learning process. So that learning runs monotonously and is the same from year to year according to the teaching materials. Many educators have used ethnosience to implement learning, but due to the lack of knowledge about ethnosience, educators do not know the term.

After conducting interviews and the results of an open questionnaire, it can conclude that some teachers have used ethnosience or local wisdom in the implementation of learning. In a previous study conducted by (Perwitasari et al., 2017) under the title Improving Scientific Literacy Through Energy Learning and Its Changes Contained Ethnosience in Fish Smoking, teachers have

utilized the local culture of the Demak area. The application of ethnosience can improve learning outcomes, especially in scientific literacy. Research conducted by Suryani (2018) with the title *The Use of Sego Megono in Ethnosience-Based Spermatophyta Matrei Learning to Improve Critical Thinking and Scientific Literacy Skills for Students of SMA Negeri 1 Subah*.

From the study results, it is proven that the use of ethnosience can improve critical thinking skills and scientific literacy. It can be concluded from several previous studies that ethnosience is proven to improve student learning outcomes and, at the same time, instill regional cultural values.

After conducting observations and interviews, two teachers applied local culture in the process of batik in learning heat to change the shape of objects. It is indicated by heating the wax on the stove from the wax, initially a solid to a liquid. In this learning process, we can see that in the process of heating wax in batik, students can learn the local culture of the area in the form of batik and, at the same time, learn about heat material that can change the shape of objects. Then one of the teachers implemented the process of making tempeh and tofu in the learning process, where the manufacture of tempe and tofu utilizes the mushroom fermentation process. In the example of making temped and tofu, students only get information from the teacher without direct observation. Students do not have a deep impression because there is no direct experience. Meaningful learning will be easy to learn and remember by students (Utari et al., 2016)

Two teachers use canned telephones as a medium for sound propagation. Where students have known canned telephones as traditional games, although monitoring canned phones is not an innovation in learning, it is imposing for students. The material for sound propagation in Kelang IV elementary school is trendy, using local wisdom of canned telephones. Students are invited directly to try to make a tin phone by using used goods, then try together whether

the phone they make works well and can transmit sound.

A teacher uses salted egg manufacture in learning materials that in the process of making salted eggs, salt enters the pores of the egg. The egg salting process aims to extend the shelf life of eggs or as a natural preservative (Rachmawati et al., 2014). One of the teachers uses the process of masking tape as a learning resource, which utilizes fungal fermentation in the process of masking tape. A study conducted by (Puspasari et al., 2019) entitled *Implementation of Ethnosience in Science Learning at SD Muhammadiyah Alam Surya Mentari Surakarta* carried tape making out in the fourth grade of elementary school. Students directly try to make the tape. In addition to studying the fermentation process, students also preserve traditional regional foods.

One of the teachers in the Mawardi Group uses the process of drying the typical Kaliwungu crackers to use solar energy as a source of learning for students. As the primary heat source, the sun is used in the process of drying the crackers. Then one of the teachers used the process of making herbal medicine as a health drink as a source of learning for students. This local wisdom-based learning, in addition to delivering subject matter, also preserves local culture (Hikmawati et al., 2020).

The results of interviews and observations show that almost all teachers have used local wisdom as a learning resource for students. This is indicated by local wisdom or culture in delivering the subject matter. Various local wisdom have been used to support the implementation of learning, such as making tempe and tofu, masking tape, making salted eggs, using canned telephones, making batik, and dry crackers.

From the results of the observation of the Learning Implementation Plan, most of the teachers have not written a lesson plan based on ethnosience or local wisdom. Teachers tend to carry out learning innovations spontaneously with ideas that suddenly appear. Learning tools in the form of

syllabus, learning implementation plans, teaching materials, LKS, LDS, and evaluation tools should be developed according to the characteristics of ethnoscience learning with activities in the form of observation, discussion, presentation, and practicum (Atmojo, 2018)

According to Damayanti et al. (2017), before compiling the syllabus and teaching materials, it is necessary to analyze the subject matter to be delivered by connecting it with the area's local culture so that the syllabus and teaching materials can be arranged according to the needs of learning and students. So that the application of ethnoscience-based learning innovations can maximally improve the quality of learning.

In fact, from the observation of the learning implementation plan document, the innovations implemented have not been stated in the Learning Implementation Plan. Educators in the Mawardi cluster, Kaliwungu sub-district, have not yet expressed ideas or ideas using ethnoscience-based learning in the lesson plans. The absence of a mature plan has caused the implementation of ethnoscience-based learning not to run optimally, but it has left its impression and experience on students.

At least there are only three teachers who have made learning plans according to the ethnoscience-based innovation that will be applied.

However, it is also not complete and coherent according to the learning carried out. Meanwhile, the other five teachers carried out spontaneous learning innovations without a supportive implementation plan. Teachers tend to carry out learning by habit or rote, and learning implementation plans are less a reference.

The implementation of ethnoscience-based learning and presenting learning materials also instills and preserves the nation's noble heritage. Teachers in instill character values both in learning materials and in learning character. Teachers are not only focused on government-printed books as the primary source of learning material. Still, they must be able to innovate to develop learning

resources that follow the material and needs of students and keep up with the times (Widyaningrum, 2018). Teachers are required to utilize all practical learning resources to support learning, especially utilizing the cultural wisdom of the surrounding environment. Teachers do not understand about ethnoscience and have not used it. It is hoped that initial knowledge about the use of ethnoscience in learning in schools is still very minimal or even unused.

CONCLUSION

There were 8 resource persons in this study, consisting of each teacher from SD Gugus Mawardi, Kaliwungu sub-district, Kendal district. Researchers used several methods such as open interviews and questionnaires to obtain research data and observation documentation. It can see that teachers' understanding of ethnoscience or local wisdom is still shallow.

This is evidenced that almost all teachers do not know the term ethnoscience itself. However, teachers better understand ethnoscience-based learning or local wisdom as contextual learning. In applying ethnoscience learning, almost all elementary school teachers have used local wisdom as a learning resource. There are already three teachers who have made innovative designs in the ethnoscience-based Learning Implementation Plan.

Knowledge of educators regarding the progress of educational science must follow developments because good education starts from educators who can continue to develop and innovate. Innovation in learning is significant because of the demands of an increasingly advanced era. For this reason, as educators, innovation is needed, both in models, methods, and learning media. Ethnoscience is a breakthrough where science is presented according to education development but still preserves the area's local culture. To apply ethnoscience-based learning, teachers must make careful preparations. They start from the analysis of the needs of students, the development of science, and the regional culture that

contains the values of science. After conducting the analysis, the teacher arranges supporting learning tools. After all the preparations have been carried out, ethnoscience-based learning will correctly. So with the application of ethnoscience-based learning, it is hoped that students' ability or learning outcomes will increase, and the nation's noble values can also be preserved.

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