



Integration of Ethnoscience in Science Learning Media: Learning about Temperature and Heat through the Traditional Salt Making Process

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Abstract: This study explores the effectiveness of video-based learning media in teaching the concepts of temperature and heat through the traditional salt production process. Conducted at SMP Islam Assunnah Bagik Nyaka in East Lombok Regency, the study involved 25 seventh-grade students and 4 teachers. The method used was community service, consisting of three stages: preparation, implementation, and evaluation. In the preparation stage, the researcher observed the science curriculum to select relevant topics, namely temperature and heat, and developed a video depicting the salt production process. During the implementation stage, the video was used as an instructional tool to facilitate interactive discussions between teachers and students about the scientific principles involved in salt production. Evaluation was carried out by collecting feedback from students and teachers through questionnaires assessing the appeal, relevance, and effectiveness of the media in enhancing understanding. The results showed a high satisfaction level (86%) among students, who found the video helpful in understanding the concepts. This study emphasizes the importance of culturally relevant teaching methods in increasing student engagement and understanding of scientific concepts, while also promoting appreciation for local traditions.

Keywords: Ethnoscience; Science learning media; Temperature and heat

Introduction

Education is a series of processes aimed at changing human mindsets to be better than before. Education is crucial for the future generations of a nation, so that they can compete both nationally and internationally (Parnabhakti et al., 2020). The rapid development of science and technology in the era of globalization demands an improvement in the quality of education to create qualified human resources (Doyan et al., 2023; Susilawati et al., 2022). Improving the quality of national education with teachers as the main foundation, who possess learning skills, is an effective step to produce skilled human resources in the 21st century (Muliyadi et al., 2023; Munandar et al., 2024; Usman et al., 2021).

Natural Sciences is one of the subjects that gives students the opportunity to develop skills to become

creative individuals with critical thinking (Aryani et al., 2019; Kartini et al., 2019). Natural Science learning is the process of systematically exploring nature to master a collection of knowledge consisting of facts, concepts, principles, discovery processes, and to develop a scientific attitude (Sevtia et al., 2022; Susilawati et al., 2025).

Learning from a cultural perspective, which connects natural phenomena to daily life, is called ethnoscience (Januarti et al., 2024; Kantina et al., 2022). Ethnoscience is implemented in learning by integrating the culture that develops in the community into the learning material (Sulistiyowati et al., 2020). Natural Science learning is one of the subjects that can use an ethnoscience approach (Puspita et al., 2022). Ethnoscience learning is a method that links the learning

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material with local culture to enhance students' understanding (Andini et al., 2022).

Ethnoscience-based learning provides students with the opportunity to understand scientific concepts through local traditions, such as the traditional salt production process. This process involves physical and chemical principles such as temperature, heat, and phase changes of matter. As such, students can develop a deeper understanding of science while also appreciating their cultural heritage.

In Natural Science education, this approach gives students the opportunity to learn scientific concepts through practices and traditions in their environment. One local tradition rich in scientific value is the traditional salt production process, which involves the principles of temperature, heat, and phase changes of matter. The integration of this tradition is expected to not only strengthen students' understanding of scientific concepts but also connect learning to real-life experiences that are close to their daily lives.

In the 21st century, skills such as critical thinking, creativity, collaboration, and communication are crucial for students to master. Educational institutions are required to prepare students to possess the 4Cs competencies: creative and innovative thinking, critical thinking and problem-solving, communication, and collaboration (Doyan, Jufri, et al., 2020; Doyan et al., 2023; Imaniar et al., 2019; Puspita et al., 2022; Susilawati et al., 2023).

The process of traditional salt production can be an ideal context for training these skills. Students can be involved in analyzing the salt production process, from temperature and heat factors to time efficiency. Additionally, group discussion-based learning and presenting ideas in the form of presentations can help develop communication and collaboration skills. Through this approach, Natural Science learning not only focuses on knowledge transfer but also on developing higher-order thinking skills.

Teaching materials play a vital role in helping the learning process to achieve Core Competencies and Basic Competencies (Ramdoniati et al., 2018). Learning media are tools that facilitate communication between teachers and students, stimulate interest, motivate learning, enhance understanding, and support the success of the learning process in achieving goals (Doyan, Gunawan, et al., 2020). Learning media are tools or materials used to stimulate students' attention, interest, thoughts, and feelings in achieving learning goals through information delivery (Fahmi et al., 2021).

The use of video-based learning media as the primary tool supports students' digital literacy skills, which are an essential part of 21st-century skills. This learning video is designed to visually and interactively present the traditional salt production process, making

it easier for students to understand abstract concepts such as heat energy changes and phase changes of matter. By utilizing attractive and accessible media, students can learn independently or in groups, supporting technology-based and innovative learning.

Additionally, the integration of ethnoscience also contributes to the preservation of local culture. The traditional salt production process, which is part of cultural heritage, is introduced to students as a form of appreciation for local values. By understanding this tradition, students not only learn science but also respect their cultural heritage. This approach supports the goals of 21st-century education, which not only produces knowledgeable generations but also those rooted in local values and capable of competing globally.

Method

This research was conducted on Sunday, November 10, 2024, at SMP Islam Assunnah Bagik Nyaka, East Lombok Regency, NTB. The participants in the study consisted of 25 seventh-grade students and 4 teachers. This research used the community service method with three main stages: preparation, implementation, and evaluation (Arifin et al., 2023).

Preparation Stage

In this stage, an observation was conducted on the science teaching process to identify topics that could be integrated with ethnoscience. Based on the observation results and needs analysis, the topic of temperature and heat was chosen, linking it to the traditional salt-making process, which is relevant to the local context. Subsequently, a learning media in the form of a video was developed, showcasing the traditional salt-making process, from solar evaporation of seawater to salt crystallization. This media was designed to facilitate students in understanding the concepts of temperature and heat in an applied manner.

Implementation Stage

In this stage, students were introduced to the learning media in the form of the developed video. The teacher presented the material on temperature and heat using the video as a tool to explain the scientific principles behind the traditional salt-making process. This activity involved interactive discussions between the teacher and students to explore the relationship between temperature, heat, and the phase changes of substances that occur during the salt production process. Students were also given the opportunity to connect the concepts they learned with their daily lives through a question-and-answer session.

Evaluation Stage

The evaluation stage was conducted to assess the responses of students and teachers toward the learning media used. Both students and teachers were asked to complete a questionnaire that covered aspects such as the attractiveness of the media, its relevance to the lesson, ease of understanding the material, and the usefulness of the media in the learning process. The data obtained from the questionnaires were analyzed descriptively to evaluate the effectiveness of the learning media in enhancing students' understanding of the concepts of temperature and heat, and to provide recommendations for further development.

Result and Discussion

In the community service activity conducted at SMP Islam Assunnah Bagik Nyaka, East Lombok Regency, NTB, the research method used consisted of three stages: preparation, implementation, and evaluation. The following is a description of the activity results:

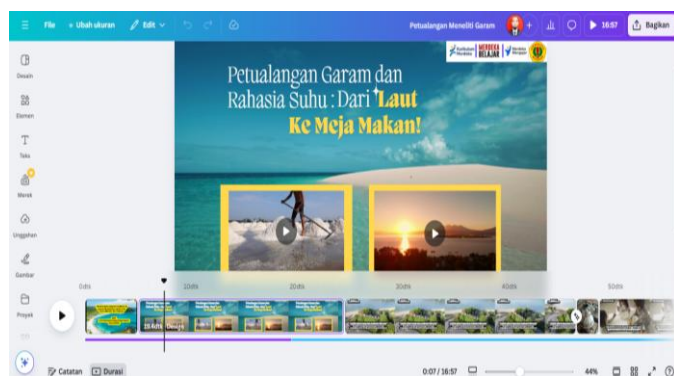
Preparation Stage

During this stage, preparations were made to create a learning video on the process of traditional salt production. The initial step involved gathering

information about traditional salt production techniques through interviews with local salt farmers, direct observations at the production site, and a literature review to integrate the concepts of temperature and heat into the lesson. Afterward, a video script was designed using the Canva application to produce an engaging and student-friendly video. This process included creating a storyboard, selecting visual elements, and developing a narrative relevant to the science lesson. Various tools were used for video production, including cameras, laptops, and the Canva application to edit and add animations and infographics that supported the scientific explanation.

Implementation Stage

In this stage, the learning video was used as the primary medium for teaching science in class VII at SMP Islam Assunnah Bagik Nyaka. The teacher played the video showing the entire process of traditional salt production, accompanied by an explanation of the concepts of temperature, heat, and phase changes of matter. The video also illustrated how solar heat affects the evaporation of seawater, leading to the formation of salt crystals. After watching the video, students were invited to discuss and identify the scientific principles involved in the process.



(a)



(b)

Figure 1. (a) Design of the traditional salt production video; (b) Introduction to the traditional salt production video

Evaluation Stage

During the evaluation stage, student and teacher responses to the use of the learning video were assessed. Both students and teachers were asked to fill out questionnaires with indicators including media attractiveness, ease of understanding the material, and relevance to the lesson. The questionnaire was designed with the following rating scale 4 = Strongly Agree (SA), 3 = Agree (A), 2 = Disagree (D), 1 = Strongly Disagree (SD).

The evaluation results showed that the learning video received an average student satisfaction score of 86%, which is considered very good. Students reported that the video helped them understand the concepts of

temperature and heat more clearly. The teacher also provided positive feedback regarding the visual appeal and effectiveness of the media in increasing student interest in learning science.

Table 1. Student Satisfaction Level with the Learning Video

Percentage	Description
76% - 100%	Strongly Agree
51% - 75%	Agree
26% - 50%	Disagree
0% - 25%	Strongly Disagree

These results indicate that the video-based learning media on traditional salt production is effective for teaching science, especially the topics of temperature

and heat. It is recommended that teachers develop similar videos for other topics to improve the quality of science education



(a)



(b)

Figure 2. (a) Teacher questionnaire response; (b) Student questionnaire response

Conclusion

The conclusion of this study is that the video-based learning media depicting the traditional salt production process proved effective in teaching the concepts of temperature and heat to students. The evaluation results showed a high level of satisfaction among students, who felt that the video helped them understand the material more effectively. This study emphasizes the importance of using culturally relevant teaching methods to enhance student engagement and understanding of scientific concepts, as well as to promote appreciation for local traditions. It is recommended that teachers develop similar videos for other learning materials to improve the quality of education.

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