Indonesian Journal of Educational Innovation (IJEI)

P-ISSN: 3109-0176 — E-ISSN: 3109-0168

https://journals.widhatulfaeha.id/index.php/jpkjl/index

Exploring the Nyorong Tradition as a Source of Contextual Science Learning in Secondary Education

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Article Info

Article History
Received: April 4, 2026
Revised: April 17, 2026
Accepted: April 29, 2026
Published: April 30, 2026

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Abstract

Contextual science learning is essential for enhancing students' understanding by linking scientific concepts to real-life experiences. This study aims to explore the Nyorong tradition of the Samawa community as a contextual learning resource for science education through an ethnoscience approach. A qualitative descriptive method was employed, with data collected through observations, semi-structured interviews with four community members, and documentation, and analyzed using data reduction, data display, and conclusion drawing. The results show that the Nyorong tradition comprises stages such as preparation, the delivery procession, and the symbolic handover, which embody educational values, including responsibility, cooperation, mutual assistance, social solidarity, and respect for cultural norms. In addition, these activities are closely related to scientific concepts such as force, work and energy, motion, energy transformation, and simple machines. It can be concluded that the Nyorong tradition has strong potential as a culturally relevant resource for contextual science learning. The findings imply that integrating local cultural practices into science instruction can support meaningful learning, strengthen conceptual understanding, and promote students' character development.

DOI:
https://doi.org/10.65622/ijei.v2i1.143

Keywords: contextual learning; ethnoscience; local wisdom; Nyorong tradition; science learning

INTRODUCTION

Science education plays a strategic role in developing students' scientific thinking, problem-solving, and science literacy skills. In implementing the Merdeka Curriculum, science education focuses not only on mastering concepts but also on developing 21st-century skills and fostering the Pancasila Student Profile (Nafiah & Aristiawan, 2023; Foa et al., 2024). One approach considered effective for achieving these goals is contextual learning, which connects scientific concepts to real-world phenomena in daily life. Contextual learning enables students to build more meaningful understanding because the concepts studied are not abstract but are linked to direct experiences (Tovar-Gálvez, 2021; Wan et al., 2024). Furthermore, this approach has been shown to enhance learning engagement and the quality of conceptual understanding because students find it easier to internalize material that is relevant to their social and cultural environments (Djarwo et al., 2025; Laksono et al., 2023).

One approach that supports contextual learning in science is ethnoscience. Ethnoscience is an approach that reconstructs local indigenous knowledge within a scientific framework to serve as a relevant and meaningful learning resource (Lidi et al., 2022; Septina et al., 2025). Operationally, the integration of ethnoscience is carried out by identifying local cultural practices, mapping these activities to scientific concepts, and developing learning activities that connect the two. This approach not only helps students understand scientific concepts contextually but also fosters an awareness that science is present in everyday life. Furthermore, ethnoscience supports inclusive and culturally responsive learning (culturally responsive teaching) and contributes to the development of character traits such as responsibility, cooperation, and appreciation for local culture (Koirala, 2023; Charles & Cajete, 2022; Farhaeni & Martini, 2023; Novayani, 2025).

A number of previous studies have shown that the ethnoscience approach can improve the quality of science education. Djarwo et al. (2025) found that the integration of ethnoscience enhances conceptual understanding and learning motivation, while Foa et al. (2024) demonstrated that local knowledge is effective in strengthening students' understanding. International studies also confirm that culture-based learning can improve science literacy and scientific process skills (Greenall & Bailey, 2022; Husamah et al., 2022). However, most of these studies remain general in nature and focus on cultural contexts that have been

Citation:
Afrilianti, S., Mahrus, M., Adianata, R., & Tenggara, D. E. (2026). Exploring the Nyorong tradition as a source of contextual science learning in secondary education. *Indonesian Journal of Educational Innovation, 2*(1), 30–35. https://doi.org/10.65622/ijei.v2i1.143

extensively studied, and have not specifically mapped the relationship between local cultural activities and specific science concepts. Furthermore, studies that systematically integrate stages of cultural activities into school physics concepts, such as work and energy, remain limited. Consequently, there is a research gap in the exploration of specific local cultures as well as in the development of a more structured conceptual mapping between cultural practices and science concepts.

Based on this, this study aims to explore the Nyorong tradition among the Samawa people as a source of contextual science learning through an ethoscience approach, by mapping the stages of the tradition, its educational values, and its connection to physics concepts such as force, work, energy, and motion. The Nyorong tradition itself is a procession for presenting wedding gifts in traditional weddings that involves complex physical activities and social interactions (Sunardi et al., 2023; Sahrul et al., 2025). The novelty of this study lies in the systematic mapping of local cultural activities into school science concepts, which is still rarely done, particularly within the context of the Samawa ethnic community. This study is expected to contribute to the development of more contextually relevant, locally-based learning resources, as well as provide practical implications for teachers in designing science lessons that are relevant, applicable, and meaningful.

MATERIALS AND METHODS

Time and place

This study was conducted in March 2026 in Sumbawa Regency, West Nusa Tenggara. The study focused on the communities of the Samawa people, who still practice the Nyorong tradition as part of their traditional wedding customs.

Research design

This study employs a descriptive qualitative approach from an ethoscience perspective. The descriptive qualitative approach is used to provide an in-depth description of the cultural phenomena of the Nyorong tradition through data consisting of activities, social behaviors, and meanings that emerge in community life. The ethnoscience perspective is used to identify the local knowledge embedded in the Nyorong tradition and link it to relevant science concepts so that it can be utilized as a source of contextual learning in secondary schools.

Research Subjects and Objects

The subjects of this study are four members of the Samawa ethnic group in Sumbawa Regency who are involved in and understand the Nyorong tradition. The object of this study is the Nyorong tradition of the Samawa tribe, analyzed in terms of the stages of implementation, educational values, and its relevance to scientific concepts as a source of contextual learning in secondary schools. Informants were selected using purposive sampling, that is, selecting informants based on their direct experience with the implementation of the Nyorong tradition and their ability to provide relevant information to meet the needs of the study. The focus of this study includes the stages of the Nyorong tradition, the educational values it contains, and its relevance to scientific concepts that could be integrated as a source of contextual learning in secondary schools.

Research procedure

The research procedure was conducted in three main stages. The first stage was the preparatory stage, which involved conducting a literature review on ethoscience, contextual learning, and the Nyorong tradition, followed by the development of research instruments, including interview guidelines, observation guidelines, and documentation forms. The second stage involved field data collection through general observation of the Nyorong tradition to identify the stages of the activities and the social interactions that occurred. Additionally, semi-structured interviews were conducted with four community informants to explore the meaning, educational value, and changes in the tradition occurring within the community. The third stage is the data analysis stage, which involves analyzing all data from observations, interviews, and documentation to map out educational values and science concepts that can be integrated into contextual learning.

Data was collected through observation, semi-structured interviews, and documentation. Observations were conducted to examine the stages of the Nyorong tradition and community activities during the procession. Interviews were conducted to gather information on cultural values, the meaning of the tradition, and the dynamics of traditional change in the modern era. Documentation was used to supplement the research data, including photographs, field notes, and other relevant supporting materials.

Research data analysis

Data analysis was conducted using the Miles and Huberman model, which consists of three stages: data reduction, data presentation, and conclusion drawing/verification. Data reduction was performed by selecting and focusing on key data from observations, interviews, and documentation. Data presentation was carried out through descriptive narratives and tables mapping the stages of the tradition and its relationship to science concepts. Subsequently, conclusions were drawn by formulating a final interpretation regarding the educational value of the Nyorong tradition and its potential as a source of contextual science learning in secondary schools.

RESULTS AND DISCUSSION

Result

Description and Stages of the Nyorong Tradition

The results of observations and interviews indicate that the Nyorong tradition is a ritual in the traditional wedding ceremonies of the Samawa people, involving the presentation of betrothal gifts from the groom's family to the bride's family. This tradition involves the participation of the extended family and the surrounding community, reflecting strong social solidarity. Generally, the Nyorong tradition consists of several main stages: (1) preparation of the dowry, (2) the dowry delivery procession, and (3) the symbolic handover to the family of the bride-to-be. During the preparation stage, the community gathers the dowry items—such as food, household goods, and traditional necessities—which are carried in specific containers. The delivery procession involves a procession of family members carrying the dowry together to the bride's home. The handover is performed symbolically through

traditional rituals that reflect politeness and respect for cultural values.

Figure 1. The Nyorong traditional ceremony of the Samawa people in Sumbawa Regency. Participants in the ceremony wear traditional attire and carry offerings on their heads as a symbol of respect and responsibility during the traditional wedding procession.

Figure 1 shows the procession of presenting betrothal gifts in the Nyorong tradition, carried out in groups by the Samawa people. The gifts are carried on the head as the group walks together toward the bride's home, reflecting the values of mutual cooperation, social solidarity, and responsibility. The activity of carrying the dowry also demonstrates physical phenomena such as force and work, as participants exert effort to move objects from one place to another. This documentation reinforces the observation that the Nyorong tradition is not only culturally significant but also has the potential to serve as a concrete context for science education.

The Potential of the Nyorong Tradition as a Resource for Science Education

The relationship between the stages of the Nyorong tradition, educational values, and the relevance of science concepts that can be integrated into contextual learning is presented in Table 1.

Table 1. Mapping of the Stages of the Nyorong Tradition, Educational Value, and Connections to Science Concepts

Stage of the Nyorong Tradition	Activity Description	Educational Values	Science Concepts	Learning Activities
Preparation of offerings	Preparing items for the offerings such as food, household goods, and traditional necessities	Responsibility, planning, family cooperation	Mass and weight, material properties, measurement	Students are asked to identify types of objects and estimate their mass/weight
Packaging and arrangement of offerings	The offerings are arranged in specific containers to ensure neatness and safety during transport	Accuracy, orderliness, efficiency	Volume, force, balance	Students analyze why the arrangement of items affects stability during transport
Procession of transporting the offerings	The offerings are carried together to the bride's house	Mutual cooperation, social solidarity	Force, work (W), energy, motion	Students analyze the relationship between force and displacement in carrying activities
Distribution of load among carriers	The load of the offerings is distributed to avoid burdening one individual	Cooperation, social equity	Resultant force, load distribution, equilibrium	Students compare the load when carried individually versus when distributed among several people
Use of supporting tools	The offerings are transported using large containers or simple tools	Creativity, work efficiency	Simple machines, frictional force	Students identify the principles of simple machines in tools used for carrying items
Symbolic handover of offerings	The offerings are handed over following traditional procedures and polite communication	Respect, social ethics, responsibility	Scientific communication (science process skills), social systems	Students prepare a structured and systematic report based on their analysis of the tradition
Serving food and social interaction	After the handover, the community gathers and interacts	Togetherness, solidarity	Heat and temperature, changes of state	Students relate cooking processes to heat transfer and changes in states of matter

Informants' Perspectives on the Use of Tradition as a Learning Resource

The interview results indicate that the informants generally responded positively to the use of the Nyorong tradition as a resource for science education in schools. Informant 2 (a teacher) stated that incorporating local cultural contexts into learning can help students understand the material more easily because it is closely related to their daily lives. Meanwhile, Informant 4 (community leader) noted that integrating traditions into learning can serve as both a cultural preservation effort and an educational tool for the younger generation.

However, some informants also emphasized the need for appropriate instructional design. Informant 3 (teacher) noted that not all aspects of tradition can be directly used as learning material; therefore, a process of simplification and adaptation to the curriculum is required. This indicates that the use of tradition as a learning resource requires systematic pedagogical planning to ensure it remains relevant to learning objectives.

The Dynamics of Changing Traditions in the Modern Era

The interview results also indicate that the Nyorong tradition has undergone changes over time, particularly in the stages of the procession, which have tended to be simplified. These changes have been influenced by economic factors and a shift toward a more practical mindset among the community. Informant 4 noted that today the practice of the tradition often involves only the immediate family, unlike in the past when it involved broad community participation.

These changes imply a reduction in the social and educational values embedded within the tradition. Nevertheless, the Nyorong tradition still holds potential as a source of contextual learning if it can be systematically documented and reconstructed within educational settings. Therefore, the integration of local traditions into education serves not only as a learning strategy but also as an effort to preserve cultural values amidst the tide of modernization.

Discussion

Analysis of Educational and Character Values

The research findings indicate that the Nyorong tradition embodies educational values relevant to the character development of students. The primary values identified are responsibility, cooperation, mutual assistance, social solidarity, and respect for customs and family. The value of responsibility is reflected in the obligation of the groom's family to meticulously prepare the dowry in accordance with customary agreements. The values of cooperation and mutual assistance are evident in the community's involvement in helping with the preparation and delivery of the dowry. The value of social solidarity is reflected in the collective participation of the community, which demonstrates strong social bonds. Additionally, the value of respect is evident in the manner of the handover, which is conducted with polite language and demeanor as a form of respect for the bride's family.

From a scientific perspective, these values are relevant to incorporate into science education because science education emphasizes not only cognitive skills but also the development of scientific attitudes such as discipline, cooperation, and responsibility in the scientific inquiry process. This aligns with the objectives of science education in the Merdeka Curriculum, which emphasizes a balance among knowledge, skills, and attitudes.

The Integration of Ethnoscience into Science Education

The results of the analysis indicate that the Nyorong tradition is linked to various science concepts that can be used as a learning context. One of the main relevant concepts is work and energy. The process of transporting gifts in the Nyorong tradition involves physical activity in the form of moving objects with a certain force, so it can be explained through the concepts of work (W) and mechanical energy. Additionally, community participation in carrying the gifts can be linked to the concepts of force, mass, and motion.

The concept of energy transformation also emerges in the transportation activity, where chemical energy in the human body is converted into mechanical energy when carrying the offerings. This phenomenon can serve as a real-world example in learning about energy transformations. Furthermore, the use of containers or tools in carrying the offerings can be linked to the concept of simple machines, such as levers and load balancing. These scientific findings indicate that the Nyorong tradition can serve as a concrete context for explaining science concepts that students often perceive as abstract. This supports a contextual learning approach that connects scientific concepts to real-world phenomena relevant to students' lives.

From a scientific perspective, these values are highly relevant to incorporate into science education because science learning emphasizes not only cognitive skills but also the development of scientific attitudes such as discipline, cooperation, and responsibility in the scientific inquiry process. This aligns with the objectives of science education in the Merdeka Curriculum, which emphasizes a balance among knowledge, skills, and attitudes.

Relevance as a Source of Contextual Learning

Based on the analysis in Table 1, the results show that each stage of the Nyorong tradition is closely linked to various science concepts that can be used as a learning context. One of the main concepts that stands out is Work and Energy. As detailed in the table, the process of transporting the seserahan involves physical activity in the form of moving objects with a certain force, so this phenomenon can be scientifically explained through the formulas for work and mechanical energy. Additionally, the community's involvement in carrying the seserahan load serves as a real-world example for exploring the concepts of force, mass, and the laws of motion in a practical setting.

The concept of energy transformation also emerges explicitly in this transport activity, where chemical energy within the human body is converted into mechanical energy when moving the wedding gifts. The phenomena mapped in Table 1 can serve as a concrete representation in learning about the transformation of energy forms. Furthermore, the use of specific containers or tools in carrying the offerings, as identified during the preparation and procession stages, is directly related to the principles of Simple Machines, such as lever systems and load balance. This finding confirms that the Nyorong tradition provides a tangible context for explaining science concepts that students often perceive as abstract.

Based on findings regarding the stages of the tradition, its educational value, and its relevance to science concepts, the Nyorong tradition holds great potential for integration as a source of contextual science learning in secondary schools. This tradition can be utilized as a context for Problem-Based Learning (PBL) or Contextual Teaching and Learning (CTL), for example, by assigning students the task of analyzing physical phenomena in the procession of carrying the seserahan.

Scientifically, integrating the Nyorong tradition into learning can enhance the meaningfulness of learning because science concepts are studied through real-world experiences relevant to students' socio-cultural environment. Learning rooted in local cultural phenomena enables students to engage in scientific thinking processes, such as observing, identifying variables, analyzing, and drawing conclusions. This aligns with the views of Lidi et al. (2022) and Septina et al. (2025) that ethnoscience bridges community knowledge with scientific concepts, thereby making learning more meaningful. Furthermore,

learning based on local wisdom can also strengthen students' character and enhance their engagement in learning (Afnan et al., 2024; Wahyuni et al., 2024). Thus, the Nyorong tradition can be viewed as an alternative learning resource that supports innovation in science education grounded in local culture.

CONCLUSION

According to research findings, the Nyorong tradition of the Samawa people follows a structured sequence of stages, ranging from the preparation of the dowry, the procession to deliver it, to the symbolic handover. This tradition embodies educational values such as responsibility, mutual aid, cooperation, social solidarity, and respect for customs and family. Additionally, the Nyorong tradition is closely linked to various science concepts, particularly force, work and energy, motion, energy transformation, and simple machines. Thus, the Nyorong tradition has great potential to be integrated as a contextual science learning resource in secondary schools.

The implications of this study are that integrating the Nyorong tradition through an ethnoscience approach can support more meaningful science learning by connecting scientific concepts with students' real-life experiences and reinforcing character development rooted in local culture. The limitations of this study lie in the still-limited number of informants and the fact that a direct implementation test of the Nyorong tradition in school learning has not yet been conducted. Therefore, further research is recommended to develop science learning modules or tools based on the Nyorong tradition and to test their effectiveness in improving students' learning outcomes, science literacy, and science process skills.

ACKNOWLEDGMENTS

The author would like to express gratitude to the Samawa community in Sumbawa Regency for providing the opportunity and support during the data collection process, particularly to the community leaders and informants who were willing to share information regarding the Nyorong tradition. The author also extends thanks to the school administration and all parties who contributed to the smooth conduct of this research—whether through observation, interviews, or documentation—enabling the study to be successfully completed.

AUTHOR'S CONTRIBUTION

Table of Author Contributions

Contribution Indicator	Author			
	1	2	3	4
Conceptualization	✓			✓
Literature Review	✓	✓	✓	
Research Design / Methodology	✓	✓	✓	
Instrument Development	✓		✓	
Data Collection	✓			
Data Curation		✓	✓	
Formal Analysis	✓	✓	✓	✓
Data Interpretation	✓	✓	✓	
Writing – Original Draft	✓			
Writing – Review & Editing	✓	✓		
Visualization / Tables		✓	✓	✓
Supervision	✓	✓	✓	✓

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