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WEAVING SCIENCE IN CULTURE: STYLE AND MOVEMENT IN THE PROCESS OF WEAVING KETAK IN JANGGO VILLAGE, CENTRAL LOMBOK

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Abstract

This research aims to uncover the integration of science concepts, especially style and motion, in local cultural practices in the form of the process of weaving ketak carried out by the community in Janggo Village, Janapria District, Central Lombok Regency. Weaving not only serves as a handicraft product of high economic and aesthetic value, but also reflects complex and repetitive motor skills, which indirectly contain the basic principles in Natural Sciences (IPA) learning. This study uses a descriptive qualitative approach with a data collection method through direct observation of the weaving manufacturing process, in-depth interviews with local artisans, and documentation of weaving activities as primary data sources. The results of the study show that in the weaving process, there is the application of forces such as pull, pressure, and thrust which have an impact on the shape, sturdiness, and beauty of the weaving. In addition, the craftsmen's regular, precise, repetitive hand movements are concrete representations of the concept of motion in physics. This activity indirectly shows that local traditional skills can be used as a source of contextual learning in science education, especially to explain the concepts of style and movement in an applicative and meaningful way. Therefore, this study recommends the development of local culture-based teaching materials such as weaving as an effective strategy to improve students' science literacy, while supporting the preservation of regional cultural heritage.

Keywords: Style, Movement, Weaving Ketak, Local Wisdom.

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INTRODUCTION

Natural Science (IPA) learning at the elementary school level has a strategic role in equipping students with contextual and applicable scientific knowledge. Science education not only aims to convey scientific facts and concepts, but also to develop critical thinking skills, problem solving, and the ability to relate science to phenomena encountered in daily life (Kusumawati et al., 2022). Therefore, a learning approach that is able to present real and

relevant experiences for students is necessary. One of the approaches that is getting more attention in the realm of education is the integration of local wisdom into the learning process. Local wisdom is knowledge and practice that grows and develops in local communities through long-term interaction with its natural environment. This wisdom is loaded with cultural, ecological, and economic values that can not only strengthen students' identities towards their environment, but also become a bridge in understanding abstract concepts in science Nuryani & Rahmawati, (2022). In the context of science learning, the integration of cultural elements is a means to foster students' emotional and cognitive attachment to the material studied. The concept of style and motion in science is one of the important materials that is often considered abstract and difficult to understand by elementary school students if it is only conveyed through a conventional or text-based approach. In fact, this concept is very close to the daily physical activities carried out by humans. Therefore, a learning media or context is needed that can show the concept of style and movement in a concrete and real way in people's cultural activities.

Janggo Village, located in Janapria District, Central Lombok Regency, West Nusa Tenggara Province, is one of the centers of ketak weaving crafts that has been going on for generations. Ketak (Lygodium circinnatum) is a vine that grows wild in tropical forests and is commonly used by the community as the main ingredient for handicrafts with high economic value. The activity of weaving ketak is not only an economic or artistic activity, but also contains complex physical activities that can be studied scientifically through the perspective of style and motion. The process of weaving ketak involves various fine motor activities such as pulling, pressing, folding, winding, and inserting ketak fibers in certain patterns. Each of these activities actually involves the basic principles of physics, namely the force that works and the movement it causes.

Tensile force, for example, is used to tighten the bonds between fibers so that the woven product becomes dense and strong. Meanwhile, changes in the position of the fibers due to pressure or thrust reflect the concept of changes in motion due to external forces. Therefore, this activity has great potential to be used as a meaningful contextual learning vehicle for elementary school students in understanding the concepts of style and movement applicatively (Ibda, H. 2022).

Several previous studies have shown that science learning based on local cultural activities can increase understanding of concepts, strengthen students' character, and foster a sense of ownership of regional culture (Yuliana & Hartati, 2021). In addition, this approach is in line with the spirit of the Independent Curriculum which prioritizes project-based, environmental, and cultural learning as a vehicle to strengthen the Pancasila Student Profile. Furthermore, this approach is also in line with the constructivist paradigm in science education which emphasizes the importance of direct experience as the basis for the formation of knowledge. According to Prasetyo et al. (2023), learning that uses visual media or concrete activities can help students construct their understanding of scientific concepts more effectively than abstract approaches.

Thus, this research was conducted to explore how the concept of style and motion emerged and was applied in the weaving activities of Ketak by the people of Janggo Village. This research also aims to analyze the potential use of weaving activities as a contextual science learning medium based on local wisdom. It is hoped that the results of this research can be the basis for the development of science teaching materials that integrate local culture, while contributing to the preservation of the nation's cultural heritage through education.

METHODS

This study uses a descriptive qualitative approach with a case study design to explore the process of weaving ketak in Janggo Village, Janapria District, Central Lombok Regency. The research subjects consisted of five artisans with more than five years of experience, who were purposively selected to obtain rich and in-depth data. Data collection was carried out through participatory observation to capture the direct activities of the artisans, in-depth interviews to explore their understanding and experiences, and documentation of the weaving process as visual evidence to support the analysis.

Data analysis follows the stages of reduction, presentation, and drawing conclusions according to the model of Miles and Huberman (1994), so that the information obtained can be processed systematically and structured. To increase the validity of the research results, triangulation of sources and techniques was carried out, which ensured the validity of the data through comparison of information from artisans and direct observation results. This approach is in accordance with a qualitative methodology that emphasizes the depth of understanding the context and meaning of the phenomenon being studied (Sugiyono, 2020).

RESULT AND DISCUSSION

This research aims to explore the relationship between local cultural activities, especially weaving in Janggo Village, and concepts in Natural Science (IPA) learning at the elementary school level. The results obtained from direct observation and in-depth interviews with the ketak artisans show that weaving activities indirectly apply various scientific concepts, especially the concepts of style and motion. This shows that traditional cultural practices not only have aesthetic and economic value, but also contain great potential as a source of contextual learning to strengthen students' understanding of science material. One of the main findings of this study is how the concept of style is applied in the process of weaving ketak. Ketak craftsmen in Janggo Village turn out to consciously or unconsciously use the principles of style in every process of making weaving. They use strong pull to keep the fibers tightly glued to each other, forming a dense and strong structure. This pull requires certain calculations so that the fibers do not break or be damaged, but remain firmly intertwined. On the other hand, gentle and controlled pressure is applied when the craftsman wants to form a certain curve or pattern on the woven structure. Excessive pressure can damage the shape, while too weak pressure is not able to form the desired pattern. The combination of these two styles of pull and pressure is a skill that has been honed through years of experience.

This phenomenon reflects the basic concept of force in physics, which is a form of interaction that can cause a change in the position, shape, or speed of an object. Prasetyo et al. (2023) explain that force is the main cause of changes in mechanical systems, which is in line with Newton's laws. In the context of weaving, when a flexible strand fiber is subjected to a certain direction and magnitude of attraction, the shape of the fiber will change according to the direction of that force. This process is very suitable to be used as a concrete example in explaining the concept of style to students. Instead of simply understanding style through illustrations in textbooks, students can experience firsthand the application of style through the weaving activities that are part of their daily lives. Furthermore, this study also found that weaving activities contain representations of the concept of motion. The process of inserting, pulling, folding, and pressing the fibers by the craftsman involves a wide variety of hand movements, including translational motions, reciprocal motions, and small circular motions. This movement is not done carelessly, but follows a certain pattern that repeats rhythmically. The craftsman must have high concentration and fine motor control so that the resulting weaving has a uniform shape and density. Regular and precise hand movements reflect the application of physical principles regarding the relationship between force and motion. Every

movement made by the hand of the craftsman is the result of the force applied, either by the muscles or through mechanical pressure on the fibers.

This relationship between force and motion is particularly relevant to Newton's first and second laws, which explain that force causes changes in the motion of objects, both in terms of velocity and direction. Yuliana and Hartati (2021) emphasized that students' involvement in culture-based activities that contain elements of science will increase their understanding of scientific concepts while fostering interest in science lessons. Weaving activities can be one of the most effective activities to bridge students' understanding of the concept of movement and style in real life. For example, when the hand pressure is too strong or unbalanced, the woven result will become uneven, tilted, or even damaged. This shows the importance of the stability of the style and rhythm of movement in producing an aesthetically pleasing woven pattern. This understanding can be adapted in science learning as an authentic example of the relationship between force, motion, and the end result of a process.

The integration of cultural activities such as weaving in science learning opens up new opportunities in the development of curricula that are contextual and relevant to students' lives. The Merdeka curriculum that is currently implemented in Indonesia encourages a project-based learning approach, contextual, and rooted in local wisdom. In this context, the activity of weaving ketak can be used as a learning vehicle that is not only fun but also meaningful. Teachers can develop modules or student activity sheets that combine weaving activities with learning the concepts of style and movement. Thus, students not only understand the theory on paper, but also practice and live the concept through real experience.

According to Kusumawati et al. (2022), a project-based approach that utilizes the surrounding environment can improve student engagement as well as their critical thinking skills. Weaving activities can be developed into classroom projects, where students are invited to observe, try, and reflect on the weaving process as part of science learning. This project can also be done in groups, so that students learn to work together, respect the opinions of others, and foster empathy for others. In the long run, this kind of learning will shape the character of students who are not only academically intelligent but also sensitive to cultural and social values. Apart from being a learning medium, weaving activities also have educational value in terms of cultural preservation. In the midst of the increasingly rapid modernization trend, many young generations are no longer familiar with traditional skills such as weaving. By integrating these activities into science lessons, students not only learn science but are also given the opportunity to get to know and appreciate the cultural heritage of their ancestors. These activities can foster a sense of pride in local culture and strengthen their identity as part of a community that has a unique history and traditions. More than that, the use of cultural activities as a learning medium also reflects a holistic educational philosophy, which views that the learning process is not only about mastering concepts but also shaping personality and life skills. Weaving activities, for example, require precision, patience and perseverance, values that are very important in daily life and are also very relevant to character education. Therefore, the results of this study recommend that the weaving activity of ketak be used as one of the main inspirations in the development of science teaching materials. Teachers can package it in the form of thematic learning modules, learning videos, or teaching aids that illustrate the relationship between weaving activities and the concept of style and movement.

In the development of these teaching materials, it is also important to involve local artisans as resource persons or learning partners. Their involvement will provide an authentic dimension and strengthen the linkage between science and cultural practice. In addition, this also opens up opportunities for collaboration between schools and the community in building an educational ecosystem that supports each other. Teaching materials developed from local

activities also have advantages in terms of relevance, because students will more easily understand materials that are directly related to their own environment.

Overall, the results of this study show that the activity of weaving ketak has great potential as a contextual learning medium in science education. Concepts such as style, motion, and shapeshifting, which are usually taught abstractly in the classroom, can be explained through concrete experiences in local cultural activities. This approach not only enriches learning in terms of content, but also strengthens students' cultural values, social skills, and character. Therefore, it is critical for educators, curriculum developers, and education policymakers to consider this approach as part of a holistic, contextual, and meaningful learning strategy.

CONCLUSION

This study reveals that the process of weaving ketak in Janggo Village, Central Lombok, actually applies the basic concepts of Natural Sciences, especially the concepts of force and motion. Craftsmen consciously apply pull, push, and pressure to the fibers to produce a strong, neat, and aesthetically pleasing weaving. The force exerted affects the shape, strength, and flexibility of the webbing, according to the basic principles of mechanics in physics. In addition, the craftsman's hand movements which include straight, circular, and rhythmic back and forth movements show the application of motion concepts and fine motor coordination that can be used as concrete examples in science learning.

These findings confirm that the activity of weaving a lot of knowledge has great potential to be used as a contextual and local culture-based science learning medium. The integration of these cultural activities in learning will make it easier for students to understand the concepts of style and movement in a real way and relevant to daily life. This approach is in line with the Independent Curriculum which encourages project-based learning and local contexts. In addition to increasing the understanding of science, this activity also fosters appreciation for traditional culture as well as training life skills. Therefore, weaving is not only valuable as a cultural heritage and economic activity, but also as an effective authentic learning resource to strengthen science literacy and connect science with culture in primary school education.

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