



Analysis of Science Content in the Jaran Kamput Tradition of the Lombok Community

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Abstract: Jaran Kamput is a tradition of the Lombok people that is still carried out today. The purpose of this research is to examine the science content that is relevant to the Jaran Kamput tradition. This descriptive qualitative research was conducted in Barejulat village, Jonggat sub-district, Central Lombok district. Data about the Jaran Kamput tradition were obtained through interviews and observations, then the data were analyzed descriptively to find science content relevant to the Jaran Kamput tradition. The results of this study indicate that the science content that is relevant to the Jaran Kamput tradition includes: the structure of plant tissue and its functions, natural and artificial additives, the balance of rigid bodies, and vibrations and sound waves. The results of this study are expected to be one of the alternatives for the enrichment of science materials for science teachers.

Keywords: Ethnoscience; Jaran Kamput; Science Content.

Introduction

Science literacy is scientific knowledge that aims to identify questions, acquire new knowledge, explain scientific phenomena, and draw conclusions based on facts, understand the characteristics of science, and implement science in life (PISA, 2018). According to Sya'ban (2016), science literacy is the knowledge to recognize concepts, understand, explain, identify, communicate, and apply science. Based on the results of the PISA survey (2018), Indonesia is in the sixth position from the bottom or 74th from other countries. The low science literacy experienced by students is caused by several factors, namely the lack of maximum mastery of learning so that the competence of students is not achieved, the lack of seriousness of students in learning, facilities that do not support the learning process both in the classroom and outside the classroom, unorganized science learning process.

Kriswanti, et al (2020) also stated that the problem that causes low science literacy in Indonesia is ineffective learning methods with a dominant learning approach that is still oriented towards memorization and emphasis on theory, without providing sufficient

opportunities for students to understand and apply science concepts contextually. This causes a lack of involvement and activeness of students in the learning process (Hastuti, et al 2022; Sinaga, et al 2020; Sari, 2020).

Based on these science literacy problems, one solution that can be proposed is the application of contextual learning by utilizing local culture and wisdom (Sumarni, et al., 2018; Atmojo, et al. 2019). The use of local culture, traditions and wisdom can have a positive influence on improving science literacy (Lubis et al, 2021; Ansumarwaty & Doyan, 2023; Bagasta, 2018). Ethnoscience-based learning activities can improve the character of students (Hadi, 2019; Perkasa, 2018; Najib, 2018) and Sudarmin (2017), as also found in research conducted by Hikmawati (2021) which shows that the ethnoscience of the Sasak tribe can develop science literacy and cultural literacy. In addition, to develop students' science literacy, learning resources such as LKPD, modules, or other teaching materials can be used. The use of learning resources allows learners to develop a deeper understanding of science concepts and see the connection between science and everyday life (Permataningsih, et al 2020; Ahmad, et al., 2020; Latifah & Dwiningsih, 2018).

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Jaran Kamput is one of the traditions originating from Lombok (Haniturahma, 2017). However, the Jaran Kamput tradition began to fade among the community and students. This Jaran Kamput tradition can be used or implemented into science learning. This can be seen from the process of making and implementing Jaran Kamput. The Jaran Kamput tradition is usually carried out in various events such as wedding processions and circumcisions accompanied by traditional Sasak music known or called Gendang Beleq (Hasbulloh, 2019). The origin of the word Gendang comes from the sound of the drum itself, namely the sound of deng or dung. Beleq comes from the Sasak language which means big. Gendang Beleq is a traditional musical instrument played in groups. This research will examine more deeply the science content in the Jaran Kamput tradition of the Lombok community.

Method

The method used in this research is qualitative which describes the situation in the field (Sugiyono, 2018). Data collection techniques using observation, interviews and documentation. The instrument in this research is an observation sheet, and the aspects revealed such as how to make, the process of the Jaran Kamput tradition and rituals. This research was conducted in Gubuk Kebon hamlet, Jonggat sub-district, Central Lombok district. This research was conducted on Tuesday, April 13, 2023, 3 sources were taken, namely Mr. Jamal as the owner of Jaran Kamput, Mrs. Rohmi as an officer of the NTB Provincial Museum, and Mrs. Aminah as a resident who had carried out the Jaran Kamput tradition at the time of circumcison and marriage.

Result and Discussion

Through interviews, observations, and documentation conducted to describe the Jaran Kamput tradition and Gendang Beleq which is used as an accompaniment to the Jaran Kamput tradition.

Jaran Kamput

Jaran Kamput is a typical art of the Sasak tribe on Lombok Island. Jaran means horse, while Kamput means mount, so Jaran Kamput can be interpreted as a riding horse (Sandi, et al. 2016). The Jaran Kamput tradition is performed in the morning, afternoon, or evening. Jaran Kamput is also popularly known as Praje Sunat, because it is often used in the circumcison tradition to entertain children who will be circumcised. At the event, children ride Jaran Kamput and are paraded around the village before undergoing circumcison. Jaran Kamput is carried by four men wearing traditional Sasak clothing such as songket and sapuk. Songket is a Sasak woven fabric that is often used

in traditional events, while sapuk is a headband of woven fabric or part of songket used by Sasak men in traditional or cultural events. Boys who will be circumcised wear a small sarong and a small kebaya for girls from the same family.



Figure 1. Jaran kamput

Jaran Kamput is also used in other traditional rituals, such as weddings to transport the bride and groom. Jaran Kamput is paraded from a certain place. If the bride and groom are from the same village, Jaran Kamput is paraded by the community and the bride and groom ride Jaran Kamput around the village. If the bride and groom are from different places, Jaran Kamput is held at the bride's residence. The bride wears kebaya clothes while the groom wears songket.



Figure 2. Jaran kamput traditional outfit

The manufacturing process involves four stages. First, strong and hard wood such as borok wood or sintok wood (*Cinnamomum Sintoc Blume*) is selected. Second, the wood is modified and shaped to resemble a horse according to the original drawing. Third, coloring is done with paint to make Jaran Kamput look attractive. Fourth, Jaran Kamput is dried by drying it in the sun. Before Jaran Kamput is used, certain rituals are performed. The aim is for the person riding the Jaran

Kamput to feel happiness, joy, and free from fear or trauma. The ritual involves the use of materials such as flowers and pandanus leaves called rampe.

Gendang Beleq

Gendang beleq is a traditional musical instrument whose main characteristic is its large size. In the Sasak language, the word "Beleq" refers to its larger size compared to other types of drums. Gendang beleqs are about 110 centimeters long and weigh about 2.5 kilograms on average. Generally, these drums are made of wood that is carved in a round or cylindrical shape. One end of the Gendang beleq is covered with animal skins such as buffalo or goat as a beating membrane.

Gendang Beleq is often played as an instrument of encouragement for soldiers who are fighting or returning from the battlefield. However, nowadays Gendang beleqs are also used as musical accompaniment in various traditional ceremonies such as weddings, circumcisions, baby haircuts or aqiqah, and other major ceremonies.

The way to play this drum involves the use of two hammers or wooden sticks with a certain technique. One hand holds the larger and heavier mallet, while the other hand holds the smaller and lighter mallet. Players take turns striking the Gendang beleq skin with these mallets, producing a variety of sounds depending on the direction and tension of the mallets.

Gendang beleqs fall into the category of membranophone instruments, where sound is produced through the vibration of a struck membrane (Saputra, 2019). This drum consists of four main parts in its structure. First, there is the cross-section of the drum or "rampeng" which functions as a membrane. Second, the tubular body of the instrument acts as a sound resonator.

Third, there is the jangat made of lulang or leather, which functions as a strap and regulates the tension of the membrane. Finally, there is the wangkis, a leather-based reinforcement strap that wraps around the rampeng to provide sound reinforcement. Figure 3 shows an example of a Gendang beleq. Based on some of the aspects found, researchers identified the Jaran Kamput and gendang beleq traditions based on community beliefs into scientific knowledge presented in Table 1.



Figure 3. Gendang beleq

Table 1. Identification of community knowledge and science knowledge into science content in Jaran Kamput and Gendang Beleq traditions.

Aspects	Knowledge Society	Science Knowledge	Basic Competencies (KD), Materials, and Grades
The wood selection uses boroc wood or sintok wood.	By using strong and durable boroc wood, the community can ensure that the Jaran Kamput that has been made has a long life and can be used sustainably.	Bore wood has two main types of tissue, xylem and phloem. Xylem is the water and mineral transporting tissue, consisting of tightly packed wood fibers. These wood fibers provide strength and hardness to the wood. Phloem is a nutrient-transporting tissue, helping to maintain the integrity of the wood. It also has lignin, which gives it hardness and protects it from pests.	KD 3.4, material on plant tissue structure and function, in class VIII SMP
Performing coloring.	Making and decorating Jaran Kamput with colors such as red, yellow, and black has deep meanings and values. Red is often used in making Jaran Kamput because it symbolizes courage, passion, and strength. The yellow color symbolizes joy, cheerfulness, and happiness. Black symbolizes	<p>1. Red Color:</p> <ul style="list-style-type: none"> -Carotenoids: Contains carotenoid compounds that give red color. Carotenoids are plant pigments formed through chemical reactions in carotenoid biosynthesis in plant cells. - Oxidation: Natural red dyes, such as extracts from red wine, can undergo oxidation when exposed to airborne oxygen. This oxidation process involves a chemical reaction between compounds present in the dye and oxygen, resulting in a red color change. 	KD 3.6 natural and artificial additives in class VIII SMP.

Aspects	Knowledge Society	Science Knowledge	Basic Competencies (KD), Materials, and Grades
	strength in facing obstacles and fighting darkness.	<p>2. Yellow Color:</p> <ul style="list-style-type: none"> - Carotene: Natural yellow colorants can be derived from carotene compounds found in ingredients such as turmeric. Carotene is a plant pigment that produces a yellow or orange color and is formed through chemical reactions in the process of carotenoid biosynthesis in plant cells. <p>3. Black Color:</p> <ul style="list-style-type: none"> - Black pigment: Black dyes can be produced through the use of black pigments such as wood charcoal. Wood charcoal is formed through the process of pyrolysis, which is the decomposition of organic matter at high heat in the absence of oxygen. This pyrolysis process involves complex chemical reactions that convert organic matter into solid carbon, which gives it its black color. 	
The symbolic meaning of Jaran Kamput.	The meaning of flowers or leaves on Jaran Kamput which symbolizes fertility and life.	Flowers and leaves are producers in the ecosystem. Producers are organisms that are able to produce their own food through the process of photosynthesis. In an ecosystem, plants convert solar energy into chemical energy in the form of sugars or carbohydrates, which are a source of food for other organisms in the food chain.	KD. 3.10 Materi ekosistem pada kelas X SMA.
The making and performing of the Jaran Kamput ritual.	Rituals involving the use of a material called "rampe" aim to create excitement and reduce fear and trauma as the child rides the Jaran Kamput during the circumcision process. Rampe is a mixture of plant materials such as flowers and pandanus leaves.	Pandan leaves are used as an herb in mepasangu. Pandan leaves contain alkaloids, protein, phosphorus, iron, thiamine, vitamin C, and high beta carotene. According to Trifiana (2019), the alkaloid content in pandan leaves can cause a relaxing sensation in the body.	KD 3.4, material on plant tissue structure and function, in class VIII SMP.
The Jaran Kamput performance is carried by four people.	The performance of Jaran Kamput which is carried by four people in the belief of the local community has several moral values, including; cooperation, collaboration, harmonious balance, courage and self-confidence.	The use of four people as bearers in Jaran Kamput performances can be related to the principle of equilibrium of rigid bodies in physics. In physics, the principle of equilibrium of a rigid body involves the moment of force generated by the forces acting on the body. In this case, the moment of force (torque) formula can be used to calculate the moment of force generated by the bearer: Moment of Force (τ) = $r \times F \times \sin \theta$	KD 3.1. Steady state equilibrium class XI
The membrane of the Gendang beleq generally made of cowhide or lendong sampi.	Cowhide in some people's beliefs is considered a symbol of life and strength. By using cowhide as the membrane of the Gendang Beleq, it is hoped that this instrument can bring strong life energy and strength to the performance, thus producing a loud sound.	There are several concepts that can be scientificized, namely: 1. Cowhide has elastic properties that allow it to vibrate well when struck. When a hammer or mallet strikes the membrane of the drum skin, the cowhide vibrates back and forth. This vibration produces mechanical waves called sound waves. The elasticity of the cowhide allows the drum to produce sound waves with high amplitude. 2. Cowhide has a high sound intensity because the molecules in the cowhide are tightly packed together, which accelerates the propagation of sound waves through the drum skin, resulting in a clear and powerful sound.	KD 3.11 and 3.10. Vibration and sound waves in class VIII SMP and class XI

Based on Table 1, it can be concluded that the selection of borer wood or sintok wood in Jaran Kamput can be understood through the material of plant tissue structure and its function in KD 3.4 class VIII junior high school. Boring wood has xylem and phloem networks that play a role in the transportation of water, minerals

and nutrients. In addition, ulcer wood also has lignin which provides hardness and protects the wood from pests.

The coloring of Jaran Kamput, such as red, yellow, and black, can be scientificized through knowledge of natural compounds that provide color, which can be

learned through KD 3.6, material on natural and artificial additives, in class VIII SMP. For example, carotenoids in beets give red color, carotene in turmeric gives yellow color, and pyrolysis of wood charcoal produces black color.

Flowers and leaves in Jaran Kamput have symbolic meanings as symbols of fertility and life. In the context of ecosystems, flowers and leaves act as producers who are able to produce their own food through the process of photosynthesis related to KD 3.10, in class X SMA. The use of four people as bearers in the Jaran Kamput performance can be related to the principle of equilibrium of rigid objects in physics related to KD 3.1, material on equilibrium of rigid objects, in class XI SMA. As well as the membrane on Gendang Beleg is generally made of cowhide or lendong sampi can be associated with KD 3.11 and 3.10 vibration and sound waves material in class VIII junior high school and class XI. This principle involves the moment of force generated by the forces acting on the object, which can be calculated using the moment of force formula.

Thus, the selection of wood, coloring, the role of flowers and leaves, and the use of four people as bearers in Jaran Kamput can be related to several relevant subject matters. The selection of wood is related to plant structure material, coloring is related to additives, the role of flowers and leaves is related to ecosystem material, and the use of four people as bearers is related to the material of equilibrium of rigid bodies. In the context of learning, the Jaran Kamput tradition can be a contextualized learning resource. This is in accordance with the contextual learning approach which assumes that students will learn better if they can experience and apply knowledge in their surrounding environment, not just learn it theoretically. Previous research findings also support the use of contextual approaches and ethnoscience approaches in learning. Research conducted by Sinaga (2019) and Andayani, et al (2021) showed that contextual learning provides a more meaningful learning experience for students. Nuralita's research (2020) found that meaningful learning can improve student understanding. In addition, research conducted by Hikmawati (2021) and Melyasari, et al (2018) showed that learning with an ethnoscience approach can improve students' science literacy.

Conclusion

Science learning with an ethnoscience approach to the Jaran Kamput tradition can be implemented through KD 3.1, 3.4, 3.6, and 3.10 on the material of plant tissue structure and its functions, in class VIII junior high school, natural and artificial additives in class VIII junior high school, ecosystems in class X high school, plant tissue structure and its functions, in class VIII junior high school, and equilibrium of rigid bodies in class XI, as well as vibrations and sound waves in classes VIII and

XI. Therefore, the application of the Jaran Kamput tradition can make learning meaningful or contextual so that it can improve students' scientific literacy through learning resources.

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