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Sasaknese Traditional Games as a Medium for Strengthening Science Literacy: Preservice Teachers' Perceptions

[1]M. Khairul Wazni, [2*]Dadang Warta Chandra Wira Kusuma
[1]Department of Biology Education, Universitas Hamzanwadi, Selong, Indonesia
[2]Department of Sport and Health Education, Universitas Pendidikan Mandalika, Mataram, Indonesia
**Corresponding Author e-mail: dadang@undikma.ac.id*
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Abstract: This study aims to explore the perceptions of preservice teachers regarding sasaknese traditional games as a medium for strengthening science literacy. This exploratory research was conducted at the Mandalika University of Education with a subject pool of 234 preservice teacher students. The research utilized a validated closed questionnaire instrument with responses gathered using a Likert scale. The data from this study were analyzed using quantitative descriptive statistics. The results of this study are permainan tradisional Sasak memiliki potensi besar sebagai media yang efektif dalam memperkuat literasi sains di kalangan mahasiswa calon guru. Persepsi positif ditunjukkan oleh mayoritas responden dari berbagai kategori, baik berdasarkan jenis kelamin, tingkat semester, maupun wilayah asal. Mahasiswa laki-laki cenderung menunjukkan tingkat persetujuan yang lebih tinggi dibandingkan perempuan, sementara mahasiswa pada semester akhir (semester VII) menunjukkan pemahaman dan apresiasi yang lebih mendalam terhadap penggunaan permainan tradisional dalam pembelajaran sains. Demikian pula, persepsi positif tersebar merata di seluruh wilayah Pulau Lombok, menunjukkan bahwa kearifan lokal dapat diterima secara luas sebagai pendekatan kontekstual dalam pendidikan.
Keywords: Sasaknese traditional games; science literacy; preservice teachers' perceptions

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INTRODUCTION

Science education in the 21st century demands more than the mastery of theoretical concepts. Scientific literacy has become an essential competence, encompassing critical thinking, problem-solving, evidence-based decision-making, and the ability to understand scientific issues in social contexts (OECD, 2018). In an era characterized by rapid scientific and technological advancement, scientific literacy empowers individuals to comprehend the natural world, make informed decisions, and actively participate in knowledge-based societies (Bybee, 2013).

In the Indonesian context, the development of scientific literacy still faces numerous challenges. The teaching approaches employed in many schools tend to be conventional, relying heavily on rote memorization and offering minimal contextualization with students' real-life experiences. This often results in low-order thinking skills and difficulty in grasping the relevance of science to daily life. International assessments such as PISA (Programme for International Student Assessment) have consistently shown that Indonesian students perform below the global average in science literacy (OECD, 2019). Contributing factors include suboptimal curricula and teaching strategies, limited opportunities for exploration, and a lack of integration of local contexts into the learning process (Aikenhead, 2006).

Preservice teachers play a vital role in enhancing science literacy, as they are not only responsible for delivering content but also serve as agents of change who influence students' scientific thinking and 21st-century skills (Bybee, 2013). Therefore,

it is crucial for preservice teachers to develop teaching strategies that are practical, contextually relevant, and aligned with students' real-life experiences (Aikenhead, 2006). This approach fosters critical thinking and prepares students to tackle complex challenges in an increasingly knowledge-driven society.

One innovative approach that addresses these challenges is ethnoscience-based learning, which integrates modern science with local wisdom. Ethnoscience leverages the knowledge, values, practices, and cultural experiences of local communities as meaningful and contextual learning media (Semali & Kincheloe, 1999). This approach enhances student engagement, as scientific concepts are conveyed through familiar cultural experiences. Furthermore, it supports inclusive education and the preservation of local culture, making it both socially and culturally relevant (Jegede & Aikenhead, 1999).

Local wisdom harbors a wealth of empirical knowledge that aligns with scientific principles. Practices such as traditional agriculture, herbal medicine, and folk games often reflect an indigenous understanding of natural phenomena. For instance, traditional games may embody elements of physics, biology, or chemistry that can be explored through scientific inquiry. Incorporating such elements into science lessons not only enhances literacy but also fosters cultural awareness and strengthens students' local identity (Gay, 2010).

In the Sasak culture of Lombok, traditional games such as main enggrang (stilts) and gasing (spinning tops) are not merely sources of entertainment, but also encapsulate scientific concepts like balance, force, motion, and friction. For example, main enggrang introduces children to principles such as center of mass, muscle coordination, and stability—concepts that, when explored in science education, can be taught in a fun and meaningful way. This strategy also contributes to the preservation of local culture amid the pressures of globalization.

The success of integrating ethnoscience into education heavily depends on the perceptions of preservice teachers. As key actors in the classroom, they are responsible for designing, selecting, and implementing instructional methods. Positive perceptions of culturally responsive teaching are a critical indicator of pedagogical innovation and authentic learning experiences. Conversely, negative perceptions may hinder the application of such strategies. Therefore, it is important to investigate preservice teachers' perceptions regarding the use of traditional games as a medium for science education. This study aims to explore the extent to which preservice teachers understand, accept, and are prepared to implement ethnoscience approaches, particularly through the utilization of Sasaknese traditional games.

METHOD

This study is an exploratory descriptive research (Kerlinger & Lee, 2011; Fraenkel et al., 2012), aimed at describing the perceptions of preservice teachers regarding sasaknese traditional games as a medium for strengthening science literacy. The study employs an ex post facto approach because the researchers only examined and measured existing attitudinal data without any manipulation or intervention (Cohen et al., 2021; Takona, 2024). The respondents were 234 preservice education students at the Mandalika University of Education, selected through convenience sampling based on accessibility and willingness to participate in an online-distributed questionnaire (Fink, 2011).

This research employed a closed questionnaire as its instrument, featuring responses based on a Likert scale (Muliadi et al., 2021). The scale included degrees of agreement: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree

(SD) (Joshi et al., 2015) and was administered via Google Forms (Alfiah et al., 2020). The questionnaire comprised 7 items, each aligned with indicators of preservice teachers' perceptions of ethnoscience, as developed by Soemardiawan, Wardhani & Muliadi (2023). The questionnaire was validated by experts and confirmed as valid. The research data were analyzed using descriptive statistics, which included calculating the frequencies of the responses.

RESULTS AND DISCUSSION

The description of the data measuring the perceptions of preservice teachers regarding sasaknese traditional games as a medium for strengthening science literacy is presented in Table 1.

Table 1. Preservice teachers' perceptions

Variables	Preservice Teachers' Answer			
	Strongly Agree	Agree	Disagree	Strongly Disagree
Gender				
Male	51	123	28	0
Female	8	19	4	0
Semester				
III	9	18	5	0
V	9	34	10	0
VII	42	90	17	0
Home Region				
East Lombok	17	44	10	0
Central Lombok	13	33	8	0
West Lombok	10	24	6	0
Mataram	12	24	5	0
North Lombok	7	17	3	0

Table 1 presents the data on preservice teachers' perceptions of Sasaknese traditional games as a medium for strengthening science literacy. The data based on gender shows that (1) male students who strongly agree were 51, agree were 123, somewhat agree were 28, and none disagreed; (2) female students who strongly agree were 8, agree were 19, somewhat agree were 4, and none disagreed. The data based on semester level shows that (1) third-semester students who strongly agree were 9, agree were 18, somewhat agree were 5, and none disagreed; (2) fifth-semester students who strongly agree were 9, agree were 34, somewhat agree were 10, and none disagreed; (3) seventh-semester students who strongly agree were 42, agree were 90, somewhat agree were 17, and none disagreed.

The data based on students' regional origin shows that (1) students from East Lombok who strongly agree were 17, agree were 44, somewhat agree were 10, and none disagreed; (2) students from Central Lombok who strongly agree were 13, agree were 33, somewhat agree were 8, and none disagreed; (3) students from West Lombok who strongly agree were 10, agree were 24, somewhat agree were 6, and none disagreed; (4) students from Mataram who strongly agree were 12, agree were 24, somewhat agree were 5, and none disagreed; (5) students from North Lombok who strongly agree were 7, agree were 17, somewhat agree were 3, and none disagreed. A detailed representation of the data is provided in Figure 1.

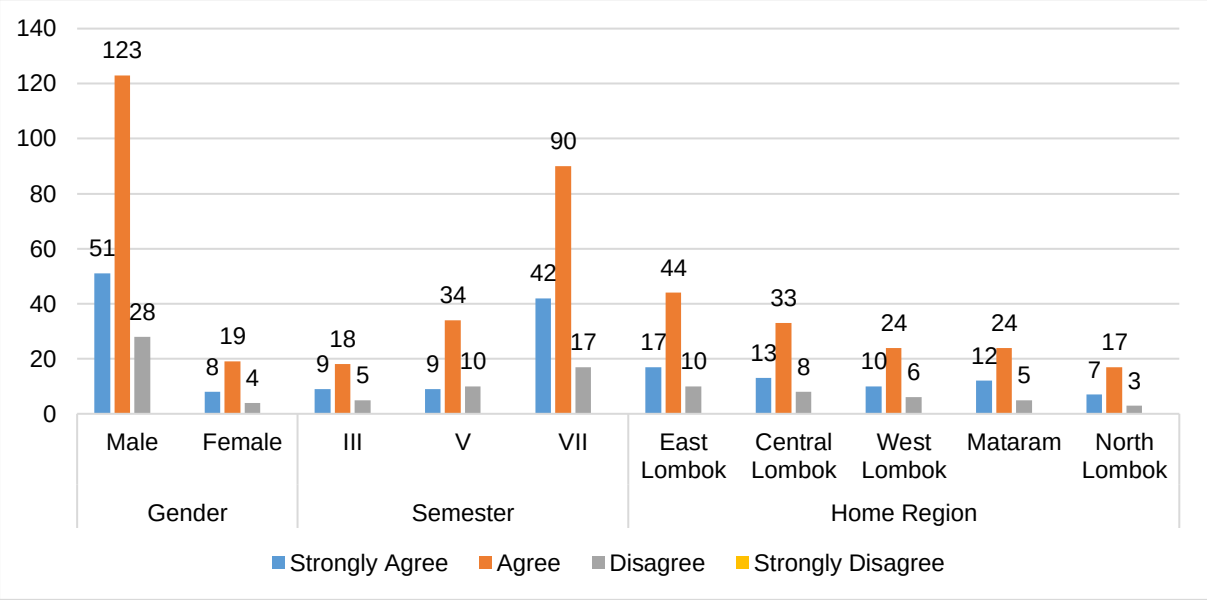

Figure 1. Preservice teachers' perceptions

The results of this study indicate that preservice teachers' perceptions of Sasaknese traditional games as a medium for strengthening science literacy are highly positive. More than 90% of respondents expressed agreement, either "Strongly Agree" or "Agree," with none stating "Disagree." This finding supports the study by Nurdin et al. (2021), which suggests that integrating local culture, such as traditional games, into science education can enhance students' understanding of scientific concepts because the material becomes more contextual and easier to grasp. In line with this, the findings show that preservice teachers recognize the great potential of Sasaknese traditional games in grounding science literacy among students. This also aligns with the views of Lestari & Widodo (2019), who argue that ethnoscience not only improves science literacy but also fosters character, cultural identity, and critical thinking skills in students.

Preservice teachers' perceptions based on gender show that male students are more likely to express "Strongly Agree" compared to female students. This finding is consistent with the study by Hermawan et al. (2020), which reveals that emotional attachment and childhood experiences with traditional games are often influenced by gender roles. Male students tend to be more physically active and have more intense experiences with traditional games, making them more likely to understand and appreciate the educational potential of these games.

Preservice teachers' perceptions based on semester level show that as students advance in their studies, the level of agreement with using traditional games as a teaching medium increases. Seventh-semester students dominated the "Strongly Agree" category, indicating that academic experience, including teaching practice and courses related to pedagogy and teaching approaches, influences their views on ethnoscience. This finding affirms the study by Kurniasih & Suryadi (2018), which shows that exposure to innovative pedagogy courses and field experience can increase preservice teachers' awareness of the importance of using contextual and culturally-based media.

Preservice teachers' perceptions based on regional origin indicate that students from areas with a strong Sasak cultural practice (such as East and Central Lombok) were more dominant in expressing "Strongly Agree." This supports the argument from Suwardana et al. (2022), which states that an individual's cultural proximity to a

tradition significantly influences their understanding and acceptance of the educational values of that tradition. Students from urban areas, such as Mataram, were less likely to fall into the "Strongly Agree" category, which can be attributed to the reduced direct interaction with traditional culture due to modernization. Nevertheless, they still showed a positive attitude, indicating a collective awareness of the importance of local culture in modern education.

The findings of this study affirm that Sasaknese traditional games have the potential to serve as teaching media that support strengthening science literacy. Games such as barapan kebo, peresean, and traditional toys based on simple physics can be naturally connected to concepts of force, motion, energy, balance, and Newton's laws. A study by Nugraha et al. (2020) also emphasizes that integrating local culture into science education not only enhances conceptual understanding but also strengthens character values such as teamwork, responsibility, and love for one's culture. This aligns with the Merdeka Belajar vision, which emphasizes relevant, enjoyable, and contextual learning.

CONCLUSION

Based on the research result, it can be concluded that Sasaknese traditional games have great potential as an effective medium for strengthening science literacy among preservice teachers. Positive perceptions were shown by the majority of respondents across various categories, including gender, semester level, and regional origin. Male students tended to show higher levels of agreement compared to female students, while students in their final semester (semester VII) demonstrated a deeper understanding and appreciation for the use of traditional games in science education. Similarly, positive perceptions were evenly distributed across the Lombok Island region, indicating that local wisdom is widely accepted as a contextual approach in education.

RECOMMENDATION

Further research is needed with a more in-depth qualitative or mixed methods approach to explore how the concrete implementation of traditional games in science education can directly shape science literacy competencies in the classroom.

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