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Evaluation Analysis of Science Learning on the Theme of Family and Community Traditions in Grade III Elementary School

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Abstract
Learning is a dynamic interaction between teachers, students, and the socio-cultural environment that shapes the overall learning experience. In Indonesian elementary schools, science learning is still dominated by textbook-based approaches that tend to be abstract and disconnected from students' daily realities. Consequently, the integration of science concepts with cultural practices that students encounter in their everyday lives remains limited. This study aims to evaluate third-grade students' understanding of science concepts within the theme *Family and Community Traditions*, with emphasis on cultural values and social roles. Using a descriptive quantitative approach, the research involved 28 students. Data were collected through a 10-item multiple-choice test, classroom observations, and learning document analysis. The findings show an average score of 7.17 (SD = 1.02), with 32% of students categorized as low-achieving. Only 43% answered correctly on items requiring connections between cultural content and personal experience, indicating a gap in linking scientific ideas with cultural traditions. These results highlight the need for contextual and culturally responsive learning strategies, including the use of visual media, folklore, exploratory projects, and community-based activities. The study emphasizes the teacher's role in creating learning environments that support scientific reasoning while fostering social empathy, cultural identity, and active community engagement. The implications offer insights for designing a more meaningful and culturally relevant science curriculum for Indonesian children.

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Introduction

Education plays an important role in shaping individuals and society. In addition to transferring knowledge, science education helps students think critically, understand their world, and appreciate the culture in which they live. Indonesia's national curriculum encourages teachers to bring learning closer to students' daily experiences, but many classrooms still rely heavily on textbooks with minimal cultural context (Astuti, 2021; Prasetyo, 2019). This study seeks to evaluate how well third-graders understand science concepts and cultural values through the lens of the theme "Family and Community Traditions".

In Indonesia, science education is integrated into the primary school curriculum as part of thematic learning. The Merdeka Curriculum and its predecessor, the 2013 Curriculum (K-13), both emphasize the importance of a contextual and student-centered approach to learning. According to Law No. 20 of 2003 concerning the National Education System, education is delivered through formal, non-formal, and informal channels that work in synergy to develop students' competencies holistically. In this system, assessments play a central role in measuring learning outcomes and guiding instruction. Teachers are expected to assess not only cognitive development but also affective and psychomotor domains, in line with national curriculum standards.

Despite policy support, science learning in many Indonesian primary schools often remains textbook-centric and lacks contextual relevance. One of the main challenges is the limited integration of local culture and real-life experiences into science teaching. Students may be able to remember scientific facts but struggle to relate these concepts to their daily lives, especially in culturally themed topics such as family and community traditions. Additionally, assessments tend to focus on written tests, ignoring other learning dimensions such as attitudes and behaviors. These issues hinder meaningful learning and student engagement.

Various studies in Indonesia emphasize the importance of a culture-based approach in science learning, showing that ethnoscience-based thematic learning is able to improve students' understanding of science and appreciation of local culture. stated that integrating local wisdom in science learning contributes to strengthening character education. Meanwhile, underlined the importance of ethnoscience strategies in encouraging student participation in their regional culture. Alviani's (2022) research using local media such as dodol aci and peuyeum through an inquiry model has also been proven to increase student involvement. In addition, the Ultimate. (2022) utilizes the Prey Institution calendar as a local approach to improve creativity and learning outcomes. Hikmawati (2021) even found that ethnoscience-based science learning models are able to shape students' cultural awareness and critical thinking.

Recent studies have highlighted the importance of contextual and culturally responsive teaching in primary education. For example, research by Sari et al. (2021) found that incorporating local cultural content into science learning improves students' motivation and understanding. Similarly, Nugroho and Widodo (2020) Indicates that students perform better when learning activities are related to their community experiences. Evaluative study by Fitriani (2022) and Promise (2019) Emphasize the role of formative assessments in helping students reflect on their values and knowledge. This study supports the need for context-rich learning and multi-dimensional assessment strategies.

Meanwhile, other countries, such as South Korea, have a Korea Institute of Curriculum and Evaluation (KICE) curriculum. The curriculum focuses on imparting competency-based skills to prepare students for the workforce and equip them with the knowledge and skills to progress to higher levels.

While a variety of researchers have explored science learning in elementary education, few have focused on how students understand cultural values through specific science learning themes. The integration of cultural identity, traditions, and social responsibility in science education is still under-researched, especially in the context of structured evaluation. Most previous studies examined teaching strategies or student outcomes in general, but did not assess how well students internalized cultural values through themed learning in elementary grades. The study seeks to fill that gap by evaluating science learning outcomes with the theme "Family and Community Traditions."

This research is important for educators, curriculum designers, and policymakers who are concerned about improving the quality of science education in Indonesia. It offers insight into how cultural themes can be effectively incorporated into classroom teaching and assessment. By evaluating students' understanding of family and community traditions, this study highlights ways to promote cultural literacy and character education in addition to academic achievement. These findings can support more meaningful evaluation practices that reflect students' holistic development in line with national educational goals.

This study aims to evaluate the learning outcomes of science with the theme "Family and Community Traditions" among Grade III elementary school students, focusing on their understanding of cultural values and participation in community life. It also seeks to identify the extent to which students' cognitive, affective, and psychomotor competencies are developed through culturally relevant learning activities.

Unfortunately, until now there is still no research that specifically evaluates how students understand and internalize cultural values through certain science learning

themes. Most of the existing research focuses more on teaching strategies or academic achievement in general, without looking deeply at the relationship between learning materials and students' cultural identities. Therefore, this research is important to provide a more comprehensive understanding of the extent to which students are able to relate the concept of science to their social life and cultural values. The main focus of this study is to evaluate the achievement of science learning with the theme "Family and Community Tradition" in grade III elementary school students, as well as to look at the development of cognitive, affective, and psychomotor competencies through culturally relevant learning approaches.

Method

This study employed a descriptive quantitative approach with a total sampling technique involving all 28 third-grade students of Petamburan 07 Public Elementary School in the 2024/2025 academic year. Data were collected over two weeks through a 10-item multiple-choice test based on Merdeka Curriculum indicators, classroom observations, and analysis of learning documents such as worksheets and teacher-developed modules, with test items validated by the subject teacher although formal reliability testing was not conducted due to time limitations. Observations were carried out directly during science lessons, while documents were gathered after each session to capture students' engagement and the cultural relevance of instructional materials. All data were processed using Microsoft Excel to generate descriptive statistics including means, standard deviations, and frequency distributions to identify achievement levels and common learning challenges. Ethical approval was obtained from the school principal, with voluntary participation and anonymization of student identities to ensure confidentiality, although the absence of a formal ethics committee approval number remains a noted limitation. While this quantitative design is appropriate for the small population and allows comprehensive coverage of the class, future research may benefit from complementary qualitative methods such as open-ended interviews or essay responses to more deeply explore students' understanding of cultural values within the theme "Family and Community Traditions."

Results and Discussion

Results

Most students score between 6 and 8, with an average score of 7.17 and a standard deviation of 1.02. However, about one-third of the class falls into the low-achievement category. The most challenging questions are those that require students to connect science topics with personal and cultural experiences (Yuliana, 2019).

The evaluation consisted of 10 multiple-choice questions with the theme "Family and Community Traditions", which were given to 28 grade III students. Each correct

answer is graded as 1 point, with a maximum score of 10. The distribution of student scores is presented in Table 1.

Table 1. Distribution of Student Scores

Correct Score	Number of Students
6	9
7	8
8	8
9	3
Entire	**25**

As shown in Table 1, the majority of students (n = 25) scored between 6 and 8, with the highest frequency observed at a score of 6. No student scored below 6 or achieved a perfect score of 10.

Descriptive statistics are calculated to provide an overview of student performance. The average score is 7.17, with a standard deviation of 1.02. The calculation process is shown in Table 2.

Table 2. Standard Deviation Calculation Table

Score (xi)	Frequency(fi)	xi - $\bar{x}$	(xi - $\bar{x}$)^2	fi × (xi - $\bar{x}$)^2
6	10	-1.17	1.3689	13.689
7	9	-0.17	0.0289	0.2601
8	6	0.83	0.6889	4.1334
9	3	1.83	3.3489	10.0467
Entire	**28**			**28.1292**

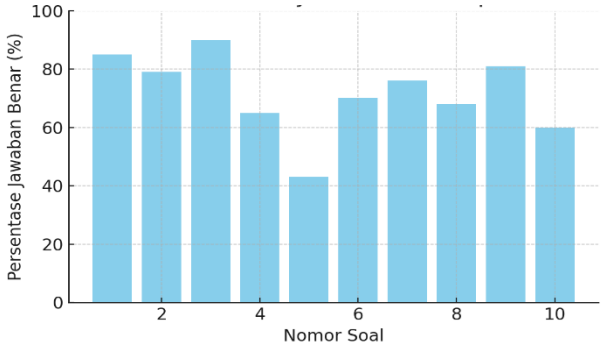
With an average ($\bar{x}$) = 7.17 and number of students (n) = 28.

Standard deviation(s) = $\sqrt{(28.1292/27)}$ = 1.0207

A standard deviation of 1.02 indicates that student scores are relatively clustered around average, indicating moderate variation in performance among students.

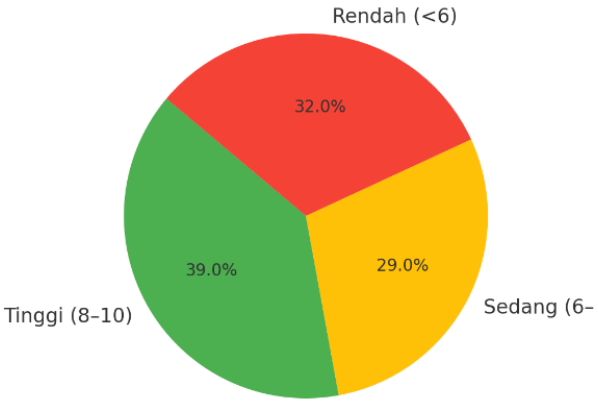
The correct response percentage for each evaluation question is summarized in Figure

Figure 1. Distribution of Third-Grade Students' Science Learning Outcomes



Items with high success rates indicate that most students are familiar with the concepts being tested, while items with low success may require deeper revision or instructional support. Students are categorized into achievement levels based on their total scores using the following criteria: High: Score 8–10; Medium: Score 6–7; Low: Score below 6. The distribution of students across categories is presented in Figure 2.

Figure 2 : Student Achievement Distribution



The data shows that 39% of students show high achievement, 29% are in the middle class, and 32% fall into the low category. This information provides the basis for further analysis of instructional effectiveness and student learning needs.

Discussion

These findings suggest that while many students perform quite well, especially when the material is familiar, some struggle due to limited exposure to unfamiliar cultural traditions or vocabulary. This level of performance can be attributed to the contextual relevance of the learning theme, which strongly resonates with students' daily experiences. According to Vygotsky's sociocultural theory, learning is more effective if it is embedded in a social and cultural context that is familiar to the learner (Wertsch, 1985). To overcome this, it is recommended to use culturally responsive teaching methods (Fitriani, 2022; Hikmawati et al., 2021; Pamungkas et al., 2022).

The enthusiasm of the students was very visible during discussions about family rituals such as birthdays, local celebrations, or mutual cooperation, which many of them wanted to share. This is in line with the findings by Astuti (2021) WHO emphasizes that culturally relevant learning themes tend to increase engagement and understanding in thematic teaching at the elementary level. Likewise, Sari and Putra (Sari et al., 2021) Found that integrating local values into science education improves student participation and reflective thinking.

This research was conducted with a quantitative descriptive approach using a total sampling technique, where all third grade students of Petamburan 07 Public Elementary School for the 2024/2025 school year as many as 28 people were involved as

respondents. The selection of this class is considered representative because of its affordable size and the relevance of the ongoing learning theme. This school was chosen because it has implemented thematic science learning in accordance with the direction of the national curriculum policy. While this approach is appropriate for small populations, the study's findings certainly have limitations in terms of generalization to a broader population.

Data was obtained through a combination of multiple-choice tests, observation of classroom activities, and analysis of learning documents. Although ethical aspects have been taken into account, such as keeping the identity of participants confidential and obtaining approval from schools, specific information regarding ethical approval numbers or licensing bodies has not been explicitly included. To strengthen the ethical validity of the research, it is important to include details of the institution or ethics committee that gave the approval. In addition, in order for students' understanding of cultural values to be more fully depicted, this quantitative approach should be enriched with qualitative methods, such as open-ended interviews or essay questions, to capture the nuances of students' personal reflections on cultural contexts in learning.

However, the study also revealed that some students struggle with certain items on the evaluation test. This can be explained by several factors. First, differences in family backgrounds mean that not all students have firsthand experience with certain cultural practices, such as traditional ceremonies or communal activities. Second, some students show difficulties with foreign vocabulary related to culture and society, which limits their ability to relate the material to personal experiences. These findings are consistent with Yuliana (2019) The WHO reports that students from less culturally enriched environments may face barriers in understanding abstract thematic concepts.

From a theoretical point of view, this research contributes to a growing body of literature on contextual and thematic learning in science education. This reinforces the idea that the integration of culturally relevant content can serve as a bridge between conceptual understanding and lived experience. Practically, the results show that teachers should deliberately combine visual media, local stories, and hands-on activities that reflect the socio-cultural environment of students.

The study also underscores the importance of differentiated teaching to address diverse student backgrounds. Providing a glossary of pre-teaching cultural terms or keywords can help close the comprehension gap, especially for students who may not be familiar with certain traditions.

There are several limitations in this study that must be acknowledged. The study was conducted in just one class with a total of 28 students, limiting its generalization. In addition, the scope of the evaluation is limited to one thematic unit, and data collection occurs within a limited period of time. These factors can affect the depth and

breadth of insights into broader trends in cultural understanding among elementary school students.

Future studies should expand the sample to include several schools with diverse socio-cultural settings, and examine whether similar trends persist in other thematic science units. Additionally, longitudinal design can offer insights into how cultural literacy and science learning evolve over time. Teachers and curriculum developers are encouraged to design learning models that emphasize cultural relevance, vocabulary scaffolding, and experiential learning to improve student outcomes.

Conclusion

This study evaluates the understanding of third-grade students about science concepts with the theme *"Family and Community Traditions"*. These findings reveal that most students show a satisfactory level of understanding, especially in identifying forms of family and community traditions that are relevant to their daily lives. This is supported by their active involvement and enthusiasm during the learning activities. However, the study also identified several challenges, including gaps in students' cultural backgrounds and difficulties in understanding specific cultural terms. These barriers demonstrate the importance of designing learning strategies that are inclusive and culturally responsive. This research contributes to science education by emphasizing the value of integrating culturally relevant content and contextual approaches in the primary school curriculum. By aligning learning materials with students' life experiences, educators can increase engagement and understanding. Future studies are encouraged to expand the scope of research across different themes and student populations to validate and deepen understanding of how cultural relevance affects science learning outcomes. In addition, further exploration of participatory and experiential learning methods can offer practical strategies for meeting diverse classroom needs.

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Authors' Note

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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