LOCAL CULTURE BASED EXPERIMENTAL METHOD IN SCIENCE AND SOCIAL STUDIES LEARNING FOR ELEMENTARY SCHOOL STUDENTS

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ABSTRACT

This study aims to analyze the need for a local culture-based experimental method in the teaching of natural and social sciences in Grade IV at Hedhazita Public Elementary School, in order to ensure that the approach used not only enriches students' understanding of the subject matter but also fosters an appreciation for their own culture. The research method employed in this study is a qualitative descriptive method of the phenomenological type. Data collection techniques used in this study include three methods: observation, interviews, and documentation. The data analysis technique applied is qualitative descriptive analysis. The data sources for this research are derived from observations, interviews, and documentation involving the school principal and one classroom teacher. The findings of this study indicate a significant need and potential for developing a local culture-based experimental method in natural and social science education. Although its implementation has not yet been carried out systematically, teachers demonstrate an open and positive attitude toward this approach. Collaborative efforts among various stakeholders are needed to realize science and social studies education that is not only scientific but also rooted in local cultural values. Thus, primary education will not only produce academically capable students but also individuals with identity, character, and concern for their culture and surrounding environment.

Keywords: Experimental Method, Local Culture, Science and Social Studies Learning

INTRODUCTION

Education is a systematic effort aimed at developing individuals' potential through learning, mentoring, and training processes. It is a conscious and planned endeavor to create an enjoyable learning environment so that students can actively develop their potential in spiritual, self-control, personality, intelligence, noble character, and the skills needed for themselves and society (Pristiwanti et al., 2022). The main goal of education is to shape individuals who are not only intellectually capable but also morally upright and equipped with life-relevant skills. Educational objectives reflect values that are good, noble, appropriate, true, and meaningful in life (Aryanto et al., 2021). An education system integrated with local culture, values, and context has been shown to enhance student understanding because the content becomes more relevant to their daily reality. This approach also plays a crucial role in shaping student identity and character, allowing them to remain rooted

in their cultural heritage while being globally competitive.

Local culture-based learning is a deliberate effort to utilize local potential effectively to create a rich learning environment that enables students to actively improve their knowledge, skills, and competencies (Saputri & Desstya, 2023). Incorporating local culture in education fosters student motivation and contextual learning experiences (Fatmi & Fauzan, 2022). By integrating local context, students can relate classroom theory to real-world practice, enriching content delivery and supporting the development of inclusive, adaptive curricula (Andini & Sirozi, 2024).

This makes learning more meaningful and increases student interest and motivation. When students find learning relevant to their environment and experiences, they become more engaged and enthusiastic. Furthermore, local culture-based education fosters creativity and innovation. Cultural values, often found in local wisdom, encompass ideas, beliefs, rules, and material elements (Sumarni et al., 2024). Understanding these traditions allows students to generate new ideas rooted in their cultural heritage. Integrating these values in elementary education fosters cultural appreciation and identity formation (Mulbar et al., 2024).

When students learn in environments that encourage cultural appreciation, they engage more actively in learning processes. This active learning environment reduces individual student burdens by encouraging peer discussions and collaborative problem-solving (Jumrawarsi & Suhaili, 2020). The impact goes beyond academic performance by supporting the development of social skills and empathy. Contextual learning, which connects instructional content with real-life situations, helps students link knowledge with everyday life applications (Laksana et al., 2021). It also strengthens character education, especially in elementary school students (Aminah et al., 2022). Emphasizing local values prepares students to face their environmental challenges while fostering appreciation for diversity and reinforcing their cultural identity.

Natural and social sciences education plays a vital role in equipping students with knowledge and skills to understand environmental and social phenomena (Dinatha et al., 2023). However, this subject is often seen as less relevant due to its perceived distance from daily life, which can decrease student interest and motivation. To address this, innovations are needed to bridge academic concepts with real-life experiences (Qondias et al., 2023). One solution is integrating local culture into learning, which can cultivate patriotism and preserve cultural heritage (Widiarini et al., 2025).

Locally rooted education is a conscious effort to wisely utilize regional potential (Nurhaliza et al., 2024). Local culture provides a rich and meaningful context for learning, as it reflects human interaction with their social and natural environments. Using local culture in science and social studies enables students to gain a deeper understanding of key concepts while appreciating and preserving their cultural heritage.

This approach also fosters critical and analytical thinking, as students are trained to observe, evaluate, and draw conclusions from real-world cultural phenomena. One effective method for this integration is the local culture-based experimental method, which directly engages students in exploring and observing culturally relevant phenomena (Laksana et al., 2024). This promotes conceptual understanding and fosters a sense of ownership, responsibility, and environmental and cultural awareness.

Previous studies show that using local wisdom-based instructional media significantly improves learning outcomes and student interest—for example, the "Eclipse Ammu Pe" media (Naitili & Nahak, 2023), or inquiry-based learning with local materials like *peuyeum sampeu*, which helped students grasp phase changes contextually (Alviani, 2022). Dewi et al. (2024) further supported this by showing that ethnoscience-based learning within the PjBL model enhances creativity while instilling cultural values.

However, most of these studies focus on the effectiveness of already-

developed models or media. In contrast, this study contributes new insights by analyzing the needs and relevance of applying a local culture-based experimental method in science and social studies education at the elementary level. The core focus of this research is not just implementation outcomes but a needs analysis as the foundation for planning and developing contextual, culturally relevant instruction. This article aims to provide a systematic foundation for designing local experimental models aligned with student characteristics and socio-cultural contexts, particularly in science and social studies, which inherently require integration of natural and social concepts.

Thus, this research is important for strengthening culturally rooted and scientifically sound lesson planning—an area still underexplored in elementary science and social studies education This article aims to explore the importance of applying a local culture-based experimental method in science and social studies education, especially for fourth-grade students at SDN Hedhazitia. This method is believed to have significant potential to enhance learning quality through more contextual, engaging, and relevant approaches. By linking scientific and social concepts to local cultural elements familiar to students, the learning process becomes more meaningful and fosters active participation. Therefore, this research seeks to analyze the need for a local culture-based experimental method to ensure that the approach not only enriches students' understanding of the material but also fosters appreciation of their own culture. This analysis is expected to yield more effective instructional strategies that support the development of critical thinking, analytical skills, and early social awareness among students.

METHOD

This research was conducted at Hedhazita Public Elementary School on April 25, 2025. The research method used was a qualitative descriptive method of the phenomenological type, chosen for its ability to provide a clear and accurate depiction of the needs related to the implementation of a local culture-based experimental method in natural and social science learning for fourth-grade students. Data collection was carried out using three techniques: observation, interviews, and documentation. Observation was used to collect data directly and systematically regarding the need for a local culture-based experimental method in natural and social science learning for fourth-grade students. Interviews were conducted to explore in-depth and open-ended information regarding the perceptions and experiences of both the classroom teacher and fourteen students concerning the use of local culture-based experiments in natural and social science learning. Documentation was employed to visually represent and support the information gathered. The data analysis technique used in this study was also qualitative descriptive, allowing for an in-depth interpretation of the findings to identify the relevance and potential for integrating local cultural elements into the experimental method of instruction.

RESULT AND DISCUSSION

The results of interviews and observations conducted with the fourth-grade teacher at Hedhazita Public Elementary School provided a clear picture of the current practices in experimental learning and the potential and need for integrating local cultural elements into the process.

According to the interviews, experiments in science and social studies have already been implemented in fourth-grade classes, particularly in topics such as photosynthesis and changes in states of matter. For instance, in teaching photosynthesis, the teacher explains the process and then asks students to conduct an experiment using a solution and leaves to observe chlorophyll content. While this already involves practical, hands-on activities, the approach remains general and does not incorporate any local cultural elements.

The teacher explained that local culture has so far only been integrated into lessons directly related to traditions or customs, such as through interviews with traditional leaders or elders. In scientific topics like photosynthesis, local culture is not yet considered relevant or integrated. This reflects a limitation in the current understanding or approach, where local culture is not always viewed as applicable to scientific learning. However, with the right approach, local culture could serve as an effective bridge between theoretical concepts and students' daily experiences.

The teacher also noted that there has never been an attempt to use materials or tools that reflect local culture—such as traditional stoves or indigenous tools—in experiments. Nevertheless, the teacher expressed interest in exploring this approach, considering it a valuable suggestion to enrich teaching methods.

One important finding from this study is the teacher's acknowledgment that local culture has not been sufficiently integrated into science and social studies instruction. The teacher recognized that under the Merdeka Curriculum, which emphasizes contextual and independent learning, integrating local culture becomes highly relevant. Students tend to understand content more easily when it is connected to their everyday lives. As a result, the teacher fully supports the use of a local culture-based experimental method as an effective strategy for teaching science and social studies.

The teacher also stated that incorporating local culture is essential because it offers students real, experiential learning. By observing cultural practices directly in their community, students do not merely learn theoretical concepts but engage in practical applications, which supports knowledge retention and deepens their connection to cultural values.

The teacher assessed that integrating local culture into experimental science and social studies learning has significant benefits, including preserving cultural continuity and values passed down from previous generations. It also fosters the development of students' character and appreciation for their cultural identity. This makes the learning process not only cognitive but also affective and psychomotor, aligning with the holistic approach promoted in education.

Interestingly, even though no experiments incorporating local culture have yet been conducted, the teacher reported no significant challenges or barriers in doing so. This suggests a strong opportunity for developing such methods without major obstacles. The interviews and observations conducted during this study also opened the teacher's perspective toward trying more relevant and contextual approaches. The teacher acknowledged that local culture holds great potential for adaptation, as long as the subject matter allows for it—for example, using natural materials or traditional tools in simple physics or chemistry experiments that reflect everyday community life.

The teacher expressed enthusiasm for designing lessons that incorporate local culture, in alignment with the Merdeka Curriculum's goals of contextual, student-centered learning. One proposed effort is to begin integrating cultural elements into experiments, whether through materials, tools, or instructional context. The teacher believes that a local culture-based experimental method is a promising idea that can revitalize science and social studies instruction—making it more engaging, meaningful, and relevant for students.

Based on these interview and observation results, there is a clear and genuine need for developing a local culture-based experimental method in science and social studies education for fourth-grade students at Hedhazita Public Elementary School. This approach not only enhances students' comprehension of subject matter but also fosters cultural pride. With the right instructional strategies, it is believed that this method can significantly improve students' critical thinking, analytical abilities, and social awareness from an early age.

Science and social studies education at the elementary level plays a

strategic role in laying the foundation for students' scientific thinking while also instilling social and cultural values from an early age. One particularly promising approach to enrich science and social studies learning is the use of local culture-based experimental methods. Through this approach, students are not only guided to understand scientific concepts both theoretically and practically, but are also given space to recognize, appreciate, and preserve the local culture that forms part of their identity. In this context, the study conducted at Hedhazita Public Elementary School emphasizes the importance of a needs analysis for experimental methods rooted in local culture in fourth-grade science and social studies learning. This is intended to identify effective strategies for improving conceptual understanding while strengthening students' cultural connection to their surroundings.

Interviews with the fourth-grade teacher at SDN Hedhazita revealed that experimental learning in science and social studies has already been implemented, but cultural elements have not been fully integrated. This aligns with the findings of Dwipayana et al. (2020), who state that interactive multimedia based on local cultural context can significantly improve student learning outcomes. Similarly, Rahmawati and Atmojo (2021) emphasize that ethnoscience-based learning is effective in connecting cultural values with scientific material, enabling students to understand and apply scientific reasoning in their daily lives.

The teacher at SDN Hedhazita expressed interest in integrating local culture into science and social studies experiments, though this has not yet been practiced directly. This reflects findings by Andayani et al. (2021), who reported that limited teacher knowledge and challenges in identifying ethnoscience concepts and materials are major barriers. However, environment- and culture-based learning has been shown to enhance both student motivation and conceptual understanding (Asfiana et al., 2025).

The study found that both teachers and students responded positively to the integration of local culture in science and social studies education, as it strengthens both conceptual understanding and the internalization of cultural values. These findings support Barokah (2025), who asserts that incorporating local wisdom in science learning can create a more holistic and contextual learning experience. In addition, research by Septiana (2025) shows that ethnoscience-based approaches not only increase student engagement but also foster scientific attitudes and cultural appreciation.

The study also revealed that the absence of local culture-based experimentation at SDN Hedhazita stems from a lack of teacher understanding of local wisdom concepts and difficulties in aligning them with the curriculum. This is consistent with the findings of Sumartini et al. (2025), who identified a lack of training, teaching materials, and media as key barriers to integrating local values into education. Meanwhile, Pinasthika and Kaltsum (2022) highlight that while experimental methods have many advantages in promoting critical thinking and curiosity, implementation challenges must be addressed with appropriate strategies and support.

Integrating local culture into science and social studies experiments can be achieved in various ways. One strategy is to use traditional tools, materials, or techniques commonly found in the local community. For example, in learning about changes in states of matter, students can observe the fermentation process in making palm sugar, tempeh, or tape (fermented cassava). In lessons on heat energy, they can compare the efficiency of traditional stoves with modern gas stoves. Students may also observe traditional environmental management practices, such as irrigation systems or the use of medicinal plants in community health practices.

Another potential strategy is school-community collaboration, where cultural figures or local practitioners are involved as resource persons or facilitators during experiments. This not only enriches students' learning experiences but also builds respect for local knowledge that may otherwise be seen as unscientific but is in fact empirically valuable.

Within the context of the Merdeka Curriculum, this approach is highly relevant, as it allows schools to develop project-based learning (PjBL) centered on local themes. PjBL encourages students to solve real-world problems and integrate new knowledge through hands-on experiences (Qondias et al., 2023). Teachers can design projects that combine science and social studies experimentation with cultural exploration—for example, by creating products from locally relevant materials that align with scientific or social studies concepts. This makes the learning process more interactive, enjoyable, and meaningful.

The findings of this study indicate a real and significant need to develop local culture-based experimental methods in science and social studies education. Although implementation has not yet been systematic, teachers demonstrated an open and positive attitude toward this approach. Collaborative efforts among various stakeholders are necessary to implement science and social studies education that is both scientifically rigorous and culturally rooted. In this way, elementary education will not only produce academically capable students but also individuals with a strong sense of identity, character, and social and cultural awareness.

CONCLUSION

Based on the findings from the research and interviews conducted with the fourth-grade teacher at SDN Hedhazita, it can be concluded that while experimental methods have been implemented in science and social studies learning, they have not yet fully integrated elements of local culture. The experiments carried out remain general and have not utilized practices or tools that reflect the cultural context of the surrounding community. Yet, local culture-based approaches hold significant potential to make learning more contextual, engaging, and meaningful for students.

The teacher expressed openness to this idea and recognized the importance of using local culture as a learning resource to enhance conceptual understanding and foster appreciation for students' cultural identities. Moreover, the integration of local culture into experimental science and social studies learning is seen as highly beneficial for instilling character values, strengthening social bonds, and revitalizing marginalized cultural heritage.

The teacher also noted that local culture-based experiments are likely to be more memorable for students, as they relate closely to their everyday lives. Although not yet implemented, the teacher expressed both readiness and enthusiasm to develop this method in the future. This indicates that, with the support of a flexible curriculum and appropriate training, the local culture-based experimental method has strong potential to become an effective and relevant learning strategy for enhancing the quality of science and social studies education in elementary schools.

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