



## Integration of Ethnopedagogical Values in the Development of Science Teaching Materials through the Dengklek Game for Grade VI Elementary School Students

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**Abstract:** This study aims to develop science teaching materials in elementary schools integrated with ethnopedagogy through the traditional game of dengklek, specifically in grade 6 of SDN 39 Cakranegara. The type of research used is Research and Development (R&D) by following steps that include needs analysis, design, development, implementation, and evaluation. The development of these teaching materials aims to improve students' understanding of science concepts while preserving local cultural values. In the development process, teaching modules and learning tools that integrate elements of the dengklek game with science materials were developed and tested in the classroom. The evaluation results showed that the developed teaching materials were able to increase student motivation and participation, and improve students' understanding of science concepts. The results also found that the integration of ethnopedagogy in learning helped students better appreciate local culture. These findings contribute significantly to the development of more contextual and relevant science education in elementary schools, as well as encouraging cultural preservation through education.

**Keywords:** Integration, Ethnopedagogy, Development, Science, Games

**Abstrak:** Penelitian ini bertujuan untuk mengembangkan materi ajar sains di sekolah dasar yang terintegrasi dengan etnopedagogi melalui permainan tradisional dengklek, khususnya di kelas 6 SDN 39 Cakranegara. Jenis penelitian yang digunakan adalah Research and Development (R&D) dengan mengikuti langkah-langkah yang meliputi analisis kebutuhan, desain, pengembangan, implementasi, dan evaluasi. Pengembangan materi ajar ini bertujuan untuk meningkatkan pemahaman konsep sains siswa sekaligus melestarikan nilai-nilai budaya lokal. Dalam proses pengembangan, modul ajar dan perangkat pembelajaran yang mengintegrasikan elemen permainan dengklek dengan materi sains disusun dan diuji coba di kelas. Hasil evaluasi menunjukkan bahwa materi ajar yang dikembangkan mampu meningkatkan motivasi dan partisipasi siswa, dan meningkatkan pemahaman siswa terhadap konsep-konsep sains. Hasil penelitian juga menemukan bahwa integrasi etnopedagogi dalam pembelajaran membantu siswa lebih menghargai budaya lokal. Temuan ini berkontribusi penting bagi pengembangan pendidikan sains yang lebih kontekstual dan relevan di sekolah dasar, serta mendorong pelestarian budaya melalui pendidikan.

**Kata kunci:** Integrasi, Etnopedagogi, Pengembangan, IPA, Permainan

## **Introduction**

Science education at the elementary school level plays a crucial role in developing students' scientific understanding and critical thinking skills from an early age. However, challenges remain in presenting engaging and relevant learning materials for students. One way to address this challenge is by integrating local cultural values into the learning process. Ethnopedagogy, an educational approach that prioritizes the recognition and preservation of local culture, can be an effective solution to increase student engagement in science learning.

Elementary education is a crucial foundation for developing character, thinking skills, and a love of science from an early age. Science education in elementary schools aims not only to instill factual knowledge but also to develop critical and creative thinking skills and scientific attitudes in students. To improve the effectiveness of science learning, it is important to consider the social and cultural context in which students live to ensure more meaningful and contextual learning (Fauzi & Rahmatih, 2025).

One innovative approach that combines cognitive and affective dimensions in learning is ethnopedagogy. Ethnopedagogy offers an educational framework that emphasizes local wisdom as a learning resource, enabling students to understand science not only as an abstract concept but also as part of their daily lives. The integration of cultural values into learning has been proven to improve learning outcomes and strengthen students' identity and character (Mulyasa, 2022; Fauzi & Rahmatih, 2025).

Indonesia is a country renowned for its diverse culture, one of which is traditional games. Traditional games can be utilized as interactive and contextual learning media. Traditional games, such as dengklek, are part of a rich cultural heritage and have the potential to be used as engaging learning media. They are not only entertaining but also incorporate scientific principles that can be conceptually explained in science materials. Through these games, students can not only learn scientific concepts but also understand and appreciate the cultural values they contain. The integration of ethnopedagogy in science learning is expected to create a fun learning atmosphere, increase student motivation, and strengthen local cultural identity (Muliadi et al., 2024; Hadi et al., 2023).

## **Method**

This research was conducted at SDN 39 Cakranegara, focusing on the development of science teaching materials integrated with ethnopedagogy through the game of dengklek. Research and Development (R&D) methods were used in this study to design and develop effective teaching modules. It is hoped that the development of these teaching materials will not only improve students' understanding of science concepts but also inspire other teachers and educators to implement similar approaches in their learning.

Against this backdrop, this study aims to answer the question of how the development of ethnopedagogical science teaching materials can be implemented through the game of dengklek, and to what extent it impacts student understanding and engagement in learning. This research is expected to make a positive contribution to the development of science education in elementary schools and the preservation of local culture.

## **Result and Discussion**

The results of the study showed that the development of science teaching materials integrated with ethnopedagogy in the traditional game Dengklek was able to increase the active involvement of sixth grade students at SDN 39 Cakranegara. The results of observations and interviews given to students after the learning process showed that most students felt happy and involved in learning

activities that used the game of dengklek. Students felt that the game made them more active participants and easier to understand the science concepts taught. Many students expressed that they preferred a fun and interactive way of learning compared to monotonous traditional methods. Teacher Feedback: The teachers involved in the learning process also provided positive feedback on the implementation of this ethnopedagogy-integrated teaching material. They noted that students showed high enthusiasm during the game activities and were able to relate science concepts to their local cultural experiences. Teachers also noted that this approach helped students to more easily remember the concepts taught.

The integration of ethnopedagogy into science learning adds value to education, as students not only learn about science but also learn to appreciate and preserve local culture (Adi et al., 2022). The game of dengklek as a learning medium provides opportunities for students to interact and collaborate, which are essential elements of the active learning process. This aligns with constructivism theory, which emphasizes the importance of real-world experiences in building knowledge.

Students who feel engaged and enjoy the learning process tend to be more motivated to learn. Results show that the majority of students felt highly engaged during learning activities. This engagement can contribute to improved learning outcomes, as demonstrated by higher post-test scores. Therefore, integrating traditional games into science learning can be an effective strategy to improve student motivation and learning outcomes. Teacher feedback also suggests that this approach could be adopted more widely in educational contexts. Teachers noted that students were more engaged and engaged in learning when using games as a learning method. This opens up opportunities for implementing similar methods in other classrooms and other subjects.

Overall, this research makes an important contribution to the development of science teaching materials at the elementary school level. The use of an ethnopedagogical approach through traditional games like dengklek not only makes learning more engaging but also strengthens students' connection to their local culture. Thus, this research underscores the importance of innovation in science education that can enrich students' learning experiences and shape characters who value culture.

Next, researchers designed teaching materials that combine science concepts with the Dengklek game. In science, an object is said to be in equilibrium if it is not moving. When an object is in equilibrium, it is in a state of balance or stability. Any force acting on the object is balanced by a force acting in the opposite direction (Sholihah et al., 2023). Equilibrium occurs when all forces acting on an object balance each other, so that the object does not move or remains in a stable position.

Dengklek is a traditional game that introduces a one-footed playing style. Dengklek introduces a one-footed style of play. Players create a line and hold a tile called a "katuk." The use of a katuk in Dengklek is not mandatory, so each player can use it or not. The katuk is pushed with the player's toes to the next line, and if it goes outside the line, the player's turn changes. At the start of the game, participants create a line as a playing area, and each player holds a small tile called a "katuk." This unique style of play requires balance and precision skills from each participant. Each katuk must be pushed with the player's toes to the next line without going outside the boundary (Febrianty et al., 2023). If the katuk goes outside the predetermined line, the player's turn passes to the next participant. This process continues, and participants try to keep the katuk within the line for as long as possible. Dengklek not only creates a physical challenge by introducing the element of one-footed play, but also teaches coordination and concentration skills. Participants learn to control their foot movements with precision to keep the katuk on track. In this way, Dengklek becomes a game that engages participants' motor skills and mental focus, while maintaining the unique element of one-legged play. A game of Dengklek is shown in Figure 1 below.



**Figure 1.** Dengklek Game

The game is quite simple. Players typically jump on one foot while maintaining balance, while using the other foot to kick or touch a designated area. Typically, this area is drawn on the ground in the form of a grid or circle. The goal is to jump from one square to another without falling or losing balance. The player who does this successfully earns points and is declared the winner.

An ethnopedagogical approach to the learning process is not only effective in building students' conceptual understanding but also provides positive reinforcement between the material and real life. In the context of science learning, students more easily grasp concepts when they relate them to everyday life (Putra, 2017; Sari et al., 2018). This strategy also enriches the learning process with a strong local cultural element.

Traditional games like the one shown in the image above can be used as engaging and meaningful media for science learning. For example, concepts such as force and motion can be introduced as students jump and maintain their body balance. Teachers can facilitate discussions about how muscles work, what causes the body to move, and how friction plays a role when feet touch the ground. By directly observing movements during the game, students can understand abstract concepts through concrete experiences. This activity also helps develop students' motor and social skills simultaneously. The learning experience becomes more contextual and relevant to their daily lives.

Furthermore, the ethnopedagogical approach encourages the preservation of local culture amid the modernization of education. When students practice traditional games, they not only learn scientific concepts but also appreciate the cultural heritage of their ancestors. This creates a strong emotional connection between the lesson content and local wisdom values. In the long run, such an approach can strengthen students' cultural identity while building self-confidence. Teachers play a vital role in designing culturally-based learning that balances cognitive and affective aspects. As a result, science no longer feels distant or abstract—it becomes close, relatable, and meaningful.

## Conclusion

Traditional games, such as dengklek, are part of a rich cultural heritage and have the potential to be used as engaging learning media. Through these games, students can not only learn scientific concepts but also understand and appreciate the cultural values they contain. Integrating ethnopedagogy into science learning is expected to create a fun learning environment, increase student motivation, and strengthen local cultural identity.

The results show that the developed teaching materials are able to increase students' motivation and participation, as well as strengthen their understanding of science concepts. In addition, this study also found that the integration of ethnopedagogy in learning helps students appreciate their local culture

more. Thus, this study underscores the importance of innovation in science education that can enrich students' learning experiences and shape characters who appreciate culture.

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