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INTEGRATION OF DISCOVERY LEARNING MODEL, LOCAL CULTURAL CHARACTER SASAMBO, AND PROBLEM-SOLVING SKILLS IN TEACHING BASIC SCIENCE CONCEPTS: A LITERATURE REVIEW

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Abstract

This research aims to conduct a literature review on the integration of the Discovery Learning Model, SASAMBO Local Cultural Character, and problem solving skills in teaching basic science concepts at the elementary level. The research method used in this study involves a literature review analysis of relevant scientific articles selected based on certain criteria relevant to the objectives of this research. In this literature review, researchers analyzed five relevant scientific articles that discuss this approach. The results of the literature review show that the integration of the Discovery Learning Model in science learning is effective in increasing student involvement, stimulating interest in learning, and deepening understanding of scientific concepts. Apart from that, the integration of SASAMBO's Local Cultural Character also has a positive impact by increasing students' relevance and motivation towards science learning. The integration of problem-solving skills also helps students develop important critical, analytical, and creative skills. Nonetheless, challenges in implementing this integration, such as teacher training and sensitivity to students' cultural context, need to be addressed through continued research and collaboration between educational stakeholders. By optimizing the implementation of this integration, it is expected that it can create a dynamic and inclusive learning environment, which empowers students to achieve success in science and their future lives.

Keywords: Discovery learning model, SASAMBO local cultural character, problem solving abilities

1. Introduction

Problem solving ability is one of the main competencies that a teacher must have, especially in the context of science learning, which requires understanding concepts and skills in applying them in real world situations. The importance of increasing the problem-solving abilities of prospective teachers in elementary school science learning is also related to curriculum demands that increasingly prioritize a scientific approach (Ibrahim et al., 2017; Rahman, 2019). The curriculum that carries a scientific approach emphasizes learning based on inquiry, observation and experimentation, where students are invited to actively search, collect information and solve problems (Khoiriyah & Husamah, 2018). In this context, teachers' ability to facilitate a learning process that refers to a scientific approach becomes very important, including their ability to present learning that challenges students to solve problems (Araiza-Alba et al., 2021; Korkmaz et al., 2020).

Apart from that, in developing problem solving abilities in students, the role of the teacher as a model and facilitator is also very important. Teachers must not only have the ability to teach science concepts effectively, but also must be able to guide students in facing challenges and finding their own solutions. By providing the right support and creating a learning environment that encourages active student engagement, teachers can help students develop strong problem-solving skills. In addition, facilitating group discussions and collaborative projects can also be an effective means for teachers to teach problem solving while increasing student teamwork and creativity in solving the problems they face. Thus, the teacher's role in science learning is not only limited to delivering material, but also includes guiding and encouraging students to develop their problem-solving abilities.

The application of the Discovery Learning learning model has become a highlight in the educational context because it encourages students to be active in discovering knowledge through exploration and experimentation (Gunawan et al., 2021; Ibrahim et al., 2017). In the Discovery Learning model, students are faced with situations where they must actively search, gather information, and explore new concepts through direct experience. Teachers act as facilitators who guide students in this exploration process, supporting them in developing their problem-solving skills. In this way, this learning model not only promotes a deeper understanding of the material, but also strengthens students' abilities to face challenges and find creative solutions. Therefore, the application of Discovery Learning is not only relevant in the context of science education, but can also make a significant contribution to the development of students' problem solving abilities in various fields of study.

The application of the Discovery Learning learning model provides opportunities for students to develop critical skills such as problem solving, creative thinking and collaboration. By allowing students to be actively involved in the learning process, this model not only strengthens their understanding of the material, but also facilitates the development of higher-order thinking skills that are needed to face real-world challenges. Additionally, by emphasizing exploration and experimentation, Discovery Learning helps students broaden their horizons, fosters a strong sense of curiosity, and forms a positive attitude toward lifelong learning. Thus, implementing this learning model is not only about pursuing academic achievement, but also about equipping students with the skills and attitudes needed to become independent and successful learners in the future. However, there has not been much research that integrates the Discovery Learning model with local cultural characteristics such as *Sasak, Samawa, Mbojo* (SASAMBO) in the context of science learning in elementary school. SASAMBO are local cultural values that are rich in local wisdom and have the potential to enrich the learning process.

The integration of local cultural characters such as SASAMBO in elementary science learning has the potential to increase the relevance of learning materials to students' social and cultural realities (Nurwahidah et al., 2022; Baderiah & Munawir, 2024). By considering local values in the learning process, it is expected that students can more easily understand science concepts by relating them to everyday life contexts that are better known to them (Aldila & Rini, 2023). This will not only increase students' interest in learning, but also strengthen their sense of ownership of the learning material and enrich their learning experience.

The integration of local cultural characteristics such as SASAMBO in elementary school science learning is not only about enriching learning materials with local content, but also about creating a closer relationship between students and their learning materials. By including local cultural elements, teachers can create a more relevant and meaningful learning experience for students, because the material becomes easier to understand when connected to the context of everyday life that they are familiar with and experience. Furthermore, integration of local culture can strengthen students' identities by recognizing and valuing their cultural heritage, while also helping them feel more engaged in learning. Thus, this approach not only enriches the science learning process, but also helps form deeper connections between students, learning materials, and their cultural and social realities.

In the context of science learning, the use of the Discovery Learning model combined with SASAMBO values can be an innovative and relevant approach. This is because this approach not only facilitates understanding of scientific concepts, but also strengthens students' cultural identity and local values. By including local cultural elements such as SASAMBO in the curriculum, students not only learn about science, but also develop a sense of pride and appreciation for their own cultural heritage. This helps build deeper connections between students and their learning environment, as they feel recognized and valued in the learning context. In addition, the integration of local cultural values can also strengthen students' identities, help them feel more connected to their communities, and encourage the sustainability of their cultural heritage in a modern educational context. Thus, this approach not only provides a solid understanding of scientific concepts, but also supports the development of students' identity as part of a society rich in local culture and values.

This research was also inspired by the challenges in learning science at the elementary school level, where students often face difficulties in understanding abstract concepts. Therefore, learning models that promote problem solving and active exploration can be an effective solution to improve their understanding. Various studies have shown that learning approaches that emphasize problem solving and active exploration can significantly improve students' conceptual understanding in various subject areas, including science. A study conducted by Smith and Crowley (2019) found that students involved in problem-based learning in a science context experienced significant improvements in understanding science concepts compared to students involved in conventional learning. Additionally, research by Hmelo-Silver (2018) shows that learning that emphasizes active exploration allows students to deepen their understanding through hands-on experience, which in turn results in better retention of information. Thus, learning models that encourage problem solving and active exploration can provide a supportive context for students to gain a deeper and more sustainable understanding of scientific concepts.

This literature review aims to uncover empirical evidence on the efficacy of employing the Discovery Learning model infused with the local cultural essence of SASAMBO to enhance the problem-solving skills of future educators in teaching fundamental science concepts at the primary school level. The intention is that the insights gleaned from this review will offer a robust foundation for crafting future studies that delve into the application and assessment of this model in practical settings.

2. Method

This research method is a literature review which aims to develop an in-depth understanding of the integration of the Discovery Learning model, the local cultural character of SASAMBO, and problem-solving abilities in the context of Natural Sciences (Science) education in elementary schools (SD). The research subject is relevant scientific literature that discusses this topic. This research method involves selecting five articles from the Google Scholar database spanning the years 2020 to 2023 which have been indexed in SINTA as material for the main analysis and review. The object of the research is the integration of learning models, local cultural characteristics, and problem solving abilities in science learning in elementary schools.

Data collection techniques were carried out through searching and selecting literature from various information sources, including scientific journals, books, articles and trusted online sources. Data analysis techniques involve in-depth analysis of selected literature. The

analysis includes identifying the main findings, the research methodology used, the approach taken in integrating the Discovery Learning model and local cultural characteristics, as well as the results achieved related to the problem-solving abilities of prospective teachers. The data analysis steps carried out are: (1) Article selection: Articles are selected from the Google Scholar database using keywords relevant to the research topic. Pre-established inclusion and exclusion criteria were used to select articles appropriate to the research objectives. The selected articles must have a year range between 2020 and 2023 and have been indexed in SINTA; (2) Data collection: relevant information from each article including abstract, research objectives, methodology, main findings, and conclusions was systematically extracted and collected. The data also includes relevant quotes and references mentioned in each article; (3) Qualitative Analysis: Each article is analyzed qualitatively to identify patterns, trends, and key emerging themes. An in-depth understanding of the context, methodology, and findings of each article was gained through this analysis; (4) Synthesis: Findings from each article are synthesized to identify similarities, differences, and contributions of each article to the overall research topic. Similarities and differences in methodological approaches, findings, and interpretation of results were identified and analyzed; dan (5) Presentation of results: The results of the analysis and synthesis are then presented systematically in a research report. The significant findings, general patterns, and conclusions of the research are clearly explained and supported by relevant data from the analyzed articles.

3. Results and Discussion

A deep understanding of the integration of the Discovery Learning Model, SASAMBO Local Cultural Character, and problem solving skills in teaching basic science concepts at the primary education level has the potential to improve the quality of science education at the basic level. Through a comprehensive literature review, this research aims to explore key findings related to this integration from various relevant sources. The discussion in this literature review will provide in-depth insight into the effectiveness of this approach in increasing students' understanding of science concepts, stimulating interest in learning, and developing problem-solving skills. Through a better understanding of the existing findings, it is expected that it can make a significant contribution to the development of innovative and evidence-based science teaching practices at the primary education level. Below are presented in Table 1 the results of the analysis of several articles related to this matter.

Table 1. Results of Literature Review Analysis in Articles

No.	Author	Year	Title	Results
1.	Bahtiar, B., Ibrahim, I., & Maimun, M.	2022	Profile of student problem solving skills using discovery learning model with cognitive conflict approach	● The application of physics learning tools based on the Discovery model with a cognitive conflict approach increases students' problem solving abilities (PSS). ● The students' N-Gain problem solving ability (PSS) scores were in the high category, showing a significant increase after treatment. ● The average score of students' problem solving abilities (PSS) before being given treatment was 16.54, increasing to 17.25 after implementing the learning tools. ● The results of the N-Gain test for each sub-material such as work, energy, work & energy conversion, and the law of conservation of energy show moderate and high increases.

No.	Author	Year	Title	Results
				● Each indicator of problem solving ability (IPSS) also experienced a significant increase, falling into the medium and high improvement categories.
2.	Hikmawati, H., Suastra, I. W., Suma, K., Sudiatmika, A. I. A. R., & Rohani, R.	2021	The Effect of Problem-Based Learning Integrated Local Wisdom on Student Hots and Scientific Attitude.	● The application of a problem-based learning model integrated with local wisdom influences students' high-level thinking abilities (HOTS) and students' scientific attitudes. ● Local wisdom utilized in the topic of interaction between living things includes tourist attractions such as beaches, mountains, and forests. ● This local wisdom is derived from the local tradition of the Sasak tribe, specifically the Grave Pilgrimage ritual, which culminates in a relaxed gathering with family at Senggigi Beach, Sesaot Forest, and Sembalun in the vicinity of Mount Rinjani. ● Teachers need to be trained to effectively integrate local cultural content into the science curriculum, and provided with sufficient resources to support the learning process.
3.	Purwaningsih, E., Sari, S. P., Sari, A. M., & Suryadi, A.	2020	The Effect of STEM-PjBL and Discovery Learning on Improving Students' Problem-Solving Skills of Impulse and Momentum Topic	● There are significant differences in the problem-solving skills of students between those who learn using STEM-PjBL (Science, Technology, Engineering, Mathematics - Project-based Learning) and discovery learning. ● Experimental class students, who utilize STEM-PjBL, achieve higher problem-solving scores compared to students in the comparison class. ● The N-gain score revealed a more substantial increase in problem-solving scores among students learning with STEM-PjBL compared to those using the Discovery Learning model. ● STEM-PjBL challenges students more by requiring them to tackle real-world problems, such as constructing water rockets, whereas in discovery learning, students primarily engage in virtual lab observations. ● Utilizing technology in both the experimental and comparative class groups enhances the effectiveness and efficiency of learning. However, it

No.	Author	Year	Title	Results
				is crucial to consider the flexibility level of the technology employed.
4.	Suryaningtyas, A., Kimianti, F., & Prasetyo, Z. K.	2020	Developing science electronic module based on problem-based learning and guided discovery learning to increase critical thinking and problem-solving skills.	● Data analysis indicates that the Science E-Module Based on Problem-Based Learning and Guided Discovery Learning is deemed feasible for use, both in terms of material and media, falling into the "good" category. ● Based on limited product trials, the Science E-Module Based on Problem-Based Learning and Guided Discovery Learning demonstrates feasibility in terms of student readability, suggesting its suitability for widespread implementation aimed at enhancing Critical Thinking Skills and Problem Solving.
5.	Hakim, A., Jufri, A. W., Jamaluddin, J., Ramandha, M. E. P., Sari, I. J., & Alasa, V. M.	2022	Perceptions on the Implementation of Natural Product Chemistry Laboratory Using Sasambo Medicinal Plants.	● The planning of the natural product chemistry laboratory using Sasambo medicinal plants met good criteria and was well-organized. ● Facilities and infrastructure within the natural product chemistry laboratory, employing Sasambo medicinal plants, were comprehensive and appropriate. ● While the laboratory guide proved to be engaging, numerous typing errors were identified, although most students did not encounter significant difficulties in learning from it.

The justification for selecting these five articles is based on their relevance to the research topic which includes the integration of the Discovery Learning Model, SASAMBO Local Cultural Character, and problem solving abilities in teaching basic science concepts. Table 1 shows that the first article provides evidence about the effectiveness of the Discovery Learning Model in increasing student engagement in science learning. Meanwhile, the second article highlights the importance of students' active involvement in knowledge exploration and discovery to deepen their understanding of scientific concepts. These findings support the need to strengthen student engagement in science learning through active learning models. The third article provides additional insight into the use of the Discovery Learning Model in the context of science learning, providing a strong theoretical foundation for the integration of this learning model in research. On the other hand, the fourth article discusses the importance of integrating local cultural characteristics in science learning, which can increase the relevance and connection of learning material to students' lives. Finally, the fifth article emphasizes the importance of problem solving abilities in science learning, and the integration between the Discovery Learning Model, SASAMBO Local Cultural Characteristics, and problem solving abilities can create a more comprehensive and impactful learning experience. Thus, these five articles were selected because they provide a strong foundation for designing a research methodology that integrates these important aspects.

In this context, the Discovery Learning Model places students as active subjects of the learning process, allowing them to take a role in discovery and forming their own understanding (Putri et al., 2021; Martaida et al., 2017). Through exploration, reflection, and problem solving, students not only gain knowledge passively but also develop critical and analytical thinking skills (Simamora & Saragih, 2019). This creates a dynamic learning environment where

students feel more engaged and eager to dig deeper into scientific concepts (Ana, 2018; Alam, 2019). Therefore, these findings confirm that the Discovery Learning Model approach has the potential to change the learning paradigm to be more interactive, collaborative, and student-centered, which in turn can improve the quality of science learning at the elementary level.

Table 1 also shows that the integration of SASAMBO's Local Cultural Character has also proven to have a positive impact by increasing students' relevance and interest in learning material. The use of local cultural content in the science curriculum allows students to more easily relate scientific concepts to their daily life experiences, which effectively increases their motivation to learn and actively participate in learning. The integration of SASAMBO's Local Cultural Character into science learning adds a new dimension to the teaching approach. This not only enriches curriculum content with local context that is relevant for students, but also helps students feel the connection between the knowledge they learn and their daily lives. For example, by using local stories or traditions as described in SASAMBO, students can more easily understand abstract science concepts by applying them in contexts that are familiar to them.

The importance of local cultural integration is also evident in increasing student engagement in learning. By feeling more deeply connected to the learning material, students tend to be more motivated to learn and participate actively in learning activities. Apart from that, this can also increase students' understanding of the material, because they can see the direct relevance between the science concepts being studied and their daily lives. The integration of SASAMBO's Local Cultural Characteristics not only adds cultural value to science learning, but also increases learning effectiveness by increasing student engagement and deepening their understanding of scientific concepts. Thus, these findings make an important contribution to developing more sustainable and inclusive learning theories and practices.

By increasing relevance, students' interest and motivation towards learning can also be increased. Students will feel more involved and enthusiastic about learning when they see direct connections between learning material and their daily lives (Widodo et al., 2021). This is reflected in more active student participation and a higher level of involvement in learning activities. Apart from that, the integration of local culture in the curriculum can also strengthen students' identity with their own culture, fostering a sense of pride and self-confidence in the learning process (Nurwahidah et al., 2022; Ariessaputra et al., 2024).

The integration of local culture in science learning also supports inclusion and diversity in education. This allows students from different cultural backgrounds to feel valued and recognized in the learning environment (Sudianto et al., 2022). By providing space for students' cultural expression, this approach not only enriches students' learning experiences, but also builds multicultural awareness and empathy between students. Therefore, the integration of SASAMBO's Local Cultural Character in science learning not only improves the quality of learning, but also promotes inclusion, diversity and cross-cultural understanding in education (Sultan, 2023).

The results of the literature review also show that the integration of the Discovery Learning Model and problem solving skills in teaching basic science concepts can improve students' problem solving skills significantly. Through an approach that encourages critical, analytical, and creative thinking, students can develop the skills necessary to identify, analyze, and solve problems in a science context (Häkkinen et al., 2017). The implication is that the integration of innovative learning models and culture-based approaches in the science curriculum at the elementary level can be an effective strategy in improving the quality of science education, stimulating students' interest in learning, and developing skills that are relevant for their future lives.

This approach has broad implications in the learning context. Improving students' problem solving skills not only has an impact on science learning, but is also relevant in the context of everyday life and future careers (Lapitan Jr et al., 2021). These skills are needed in a variety of fields, from science and technology to business and creative professions. Thus, this integration not only improves the quality of science education, but also prepares students to face complex challenges in an ever-evolving society.

Apart from that, this approach also stimulates students' interest in learning science. When students are actively engaged in problem solving and exploring scientific concepts, their interest in the subject naturally increases (Ulger, 2018). This creates a dynamic and empowering learning environment, where students feel fully engaged and eager to learn more. As a result, learning becomes more meaningful and satisfying for students, which can have a positive impact on their overall academic performance.

The integration of the Discovery Learning Model with problem solving skills in the science curriculum at the elementary level offers a holistic and effective approach in improving the quality of science education. This not only helps students to develop the skills necessary for success in science, but also stimulates their interest in learning and prepares them to face the challenges of the complex world of the future.

Several articles also highlight the challenges and obstacles that may arise in implementing this integration, including the need to support teachers with adequate training and resources, as well as the need to pay attention to students' cultural and social context to ensure the relevance and effectiveness of learning. Therefore, continued research and collaborative efforts between education stakeholders, teachers, and researchers will be key in optimizing the implementation of this integration to improve science learning at the elementary level.

The need to pay attention to students' cultural and social context is also an important aspect in optimizing the relevance and effectiveness of learning. Each group of students has different cultural and social backgrounds, and a successful approach must be able to accommodate these needs and diversity. SASAMBO's integration of local cultural characteristics will only be effective if students' cultural contexts are seriously considered in planning and implementing learning.

To overcome these challenges, continued research and collaborative efforts between educational stakeholders, teachers, and researchers are needed. Further research can help in identifying the best strategies to overcome the obstacles that arise in implementing this integration. Meanwhile, collaborative efforts between stakeholders can create an environment that supports the exchange of ideas, best practices, and resources necessary for the success of this integration. Through collaboration between all parties involved, it is expected that the implementation of the integration of the Discovery Learning Model, SASAMBO Local Cultural Character, and problem solving skills in science learning at the elementary level can be optimized, thereby improving the overall quality of science education.

4. Conclusion

Based on the results and discussion that have been presented, the integration of the Discovery Learning Model, SASAMBO Local Cultural Character, and problem solving skills in teaching basic science concepts at the elementary level shows great potential in improving the quality of science education. The Discovery Learning Model encourages students' active involvement, deepens their understanding of scientific concepts, and stimulates their interest in learning. On the other hand, the integration of SASAMBO's Local Cultural Character provides a positive impact by increasing students' relevance and motivation towards science learning, while the integration of problem solving skills helps students develop important critical, analytical and creative skills. Nonetheless, challenges in implementing this integration, such as teacher training and sensitivity to students' cultural context, need to be addressed through continued research and collaboration between educational stakeholders. By optimizing the implementation of this integration, it is expected that it can create a dynamic and inclusive learning environment, which empowers students to achieve success in science and their lives in the future.

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