

Validity of the Environmental Change and Environmental Conservation Booklet Integrated with Local Wisdom

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Article Information

Received: July 09, 2024
 Revised: July 12, 2024
 Online: July 16, 2024

Keywords

Booklet, Local Wisdom, Validity

ABSTRACT

This research aims to develop and validate a biology learning booklet that integrates local wisdom on the topics of Environmental Change and Environmental Conservation for 10th-grade high school students in Phase E. The research method used is descriptive qualitative with validation through Focus Group Discussion (FGD). The booklet was developed by integrating local wisdom values and environmental issues in Padang City. Validation was conducted on three main components: material, construction, and language. The validation results show that the booklet has an average validity score of 3.3, which falls into the valid category. This booklet is designed to develop students' problem-solving skills through integrated learning questions and activities. The study concludes that the developed booklet is valid and has the potential to enhance the effectiveness of contextual and meaningful biology learning by integrating local wisdom. It is recommended to conduct further research on the practicality and effectiveness of the booklet in classroom learning implementation.

INTRODUCTION

Local wisdom comprises traditional knowledge, practices, and values that develop within a specific community, are passed down from generation to generation, and serve as guidelines in daily life and in facing various environmental and social challenges. Local wisdom plays a crucial role in disaster mitigation in Indonesia, providing time-tested and culturally relevant knowledge to reduce risks and enhance community resilience [1]. The integration of local wisdom in science education not only improves students' environmental literacy but also helps preserve valuable traditional knowledge [2]. This is also supported by Oktavianti & Ratnasari (2021), who assert that integrating local wisdom into learning not only enriches students' knowledge but also ensures the preservation of cultural heritage amidst modernization [3]. Local wisdom is not just cultural heritage, but also a valuable resource for sustainable development, offering solutions that have proven effective and

appropriate to local contexts. Education based on local wisdom helps students connect academic knowledge with the realities of their daily lives, creating more meaningful and contextual learning experiences [4]. Putri et al. (2024) observe that the integration of local wisdom into disaster risk reduction strategies in Southeast Asia has shown increased effectiveness and community acceptance of mitigation efforts [5].

Learning innovations based on local wisdom allow students to develop a deep understanding of their environment while stimulating creativity in applying traditional knowledge to modern challenges [6]. Prasetyo & Anggoro (2023) affirm learning that integrates local wisdom as an educational innovation not only enhances students' knowledge and creativity but also fosters sensitivity towards the environment and cultural values [7].

The alignment between learning materials and students' life experiences, realized through the integration of local wisdom, creates more meaningful learning and improves long-term memory retention [8]. The incorporation of local wisdom into educational practices enhances students' engagement with the material, providing a contextual framework that facilitates deeper understanding and more meaningful learning experiences [9].

The integration of local wisdom into biology learning is an innovation that provides the broadest opportunity for students to achieve learning goals as a provision for facing future life while still adhering to their regional cultural values. The application of learning integrated with local wisdom certainly requires learning media, one of which uses booklets. Puspita et al. (2020) state that booklets as learning media offer an attractive and portable format, allowing students to access learning materials flexibly in various situations and times [10]. This is also expressed by Wijayanti et al. (2021), who say that the simplicity and portability of booklets make them an effective learning resource, enabling students to delve into the material without time and place limitations [11].

Booklets, with their attractive design and compact size, offer high learning flexibility, allowing students to study and review materials anytime and anywhere [12]. The compatibility between learning media and material must consider the basic competencies used in phase E or 10th grade of high school. In phase E, students are required to have the ability to create solutions to problems based on local or global issues from their understanding of biodiversity and its roles, viruses and their roles, biotechnology applications, ecosystem components and interactions between components, as well as environmental changes. The material discussed in this booklet is about Environmental Change and Environmental Conservation. Learning that addresses the content of environmental change and environmental conservation packaged in the form of a booklet strongly supports meeting the demands of Phase E with problem-solving based on local issues, specifically issues in Padang City. Environmental problems occurring in Padang city, ranging from water pollution, soil pollution, air pollution, as well as the *ma elo pukek* culture that can preserve the environment, can be used in the booklet. Thus, learning becomes contextual for students. Based on the above explanation, the purpose of this research is to produce learning media for Phase E 10th grade high school in the form of a valid Environmental Change and Environmental Conservation Booklet Integrated with Local Wisdom to Develop Problem-Solving Skills in Students.



METHODS

This research uses a descriptive qualitative method. Each indicator in the booklet is integrated with the local wisdom values of the community. The developed learning device design is then validated by experts in a discussion forum called Focus Group Discussion (FGD). The focus of the discussion in the FGD activity is to discuss the validity of the developed booklet, covering the components of content, language, and presentation. The FGD forum is a small group discussion activity. FGD is an effective tool for exploring social norms, revealing group dynamics, and understanding collective perceptions about a topic [13]. FGD (Forum Group Discussion) or Focused Group Discussion typically involves a small group of participants, usually 6-10 people, guided by a moderator to discuss predetermined topics or questions. This discussion takes place in a limited duration, generally 1-2 hours, and emphasizes interaction and exchange of opinions among participants. This method is very useful for exploring opinions and attitudes, identifying trends and patterns in perceptions, generating new ideas, and validating findings from other research methods. With a structured yet flexible format, FGD allows researchers to gain in-depth insights on a topic through group dynamics and diverse expressions of views from participants. There are several components, namely content, language, and presentation components, which are presented in the form of a booklet and validated by experts in FGD activities.

RESULTS

The research conducted is a study on the development and validity of an Environmental Change and Environmental Conservation Booklet Integrated with Local Wisdom to Develop Problem-Solving Skills in Students. The developed booklet presents material on Environmental Change and Environmental Conservation integrated with environmental issues in Padang City, starting from water, air, and soil pollution problems.

The booklet contains three main sections including introduction, content, and conclusion. The elements of the developed booklet include cover, preface, table of contents, appropriate basic competencies and indicators, material, booklet supporting features, conclusion, and bibliography. The booklet's supporting feature is a reflection activity that facilitates students in understanding biodiversity material. The booklet is designed to be attractive and practical, printed in A5 size for flexible use. A booklet is a concise and thin book with specific information. Educational booklets serve as concise learning tools, offering a structured format with introductory material, core content, and concluding sections. Unlike traditional textbooks, these booklets present information in a more condensed and accessible manner, making them particularly effective for focused topics in environmental education [14].

Booklets as learning media offer flexibility, concise information summaries, and visual support through images, facilitating better understanding of learning materials [15]. Sulistyowati & Prahani (2021) argue that the advantage of booklets lies in their flexibility of use, presentation of concise yet comprehensive information, and the use of supportive images, enabling students to more easily understand and remember the material [16].

Booklets, with their flexible characteristics, concise explanations, and use of informative images, have proven effective in improving students' understanding of various learning subjects [17]. This information enhances students' knowledge, ensuring that learning about environmental conservation and change aligns with the examples presented in the booklet.

This is reinforced by Rahayu et al. (2015), who state that the principles of local wisdom serve as a transformative force to support competitive and comparative human resources, ensuring that the principles of local wisdom themselves will not hinder progress in the global era. Therefore, incorporating principles of local wisdom into learning media is a prudent step to nurture a generation with character. The developed booklet has been tested for validity, readability, and student response [18].

Table 1. Validation results for each component of the learning device

No	Assessment Component	Validator			Total	Validity Score	Criteria
		1	2	3			
1	Material	29	28	33	90	3,34	Valid
2	Construction	29	29	31	89	3,33	Valid
3	Language	10	9	10	29	3,23	Valid
Total validity score						9,9	
Average validity score						3,3	Valid

Based on Table 1, it can be seen that the average validity score is 3.3, which falls into the valid category. These validation results indicate that the booklet developed by the author is valid in terms of material, construction, and language. The validity of the booklet in these aspects suggests its potential to enhance the effectiveness of biology learning, especially in contexts that integrate local wisdom. Thus, the developed booklet not only meets validity standards but also has the potential to support the improvement of students' skills in contextual and meaningful biology learning.

Suastra & Ristiati (2021) state that the development of valid biology learning tools integrated with local wisdom, encompassing content, linguistic, and presentation components, can effectively enhance students' skills in meaningful learning contexts. Biology learning tools that are integrated with local wisdom and have been validated can become effective instruments in developing various student skills, including problem-solving and critical thinking in local contexts [19]. Winaryati et al. (2022) also assert that the validation of learning tools through Focus Group Discussions (FGD) by experts is a crucial stage in ensuring the quality and effectiveness of the tools in developing students' skills in local wisdom-based biology learning [20].

The booklet includes questions that form learning activities, designed to explore students' problem-solving skills. Booklets equipped with problem-solving activities enable students to develop higher-order thinking skills, including identifying problems, analyzing facts, and drawing conclusions based on evidence. Learning activities in the booklet that require students to assess, explain, and interpret information have proven effective in enhancing critical thinking skills and problem-solving abilities [21]. Pramesti & Susanti (2021) state that the use of booklets with specially

designed questions can stimulate students' problem-solving skills, encouraging them to identify, analyze, and critically evaluate information [22].

Comprehensive lesson planning, including the design of diverse tasks, is key to the success of the learning process. Well-prepared lesson planning, including the design of varied assignments, is crucial for successful teaching and learning. Teachers need to prepare all aspects of learning before class begins to ensure teaching effectiveness [23]. Prasetyo et al. (2023) add that teachers who conduct detailed lesson planning, including designing a variety of relevant tasks, tend to produce more effective learning processes and better student learning outcomes. This planning becomes an important foundation for successful learning [7].

Further research on the practicality and effectiveness of learning devices integrated with local wisdom is crucial to validate their application in biology learning and identify areas that require improvement. The study of the practicality of learning devices based on local wisdom must consider aspects of implementation, student activities, and constraints faced by teachers, to ensure their effective implementation in the context of biology learning. Evaluation of the practicality and effectiveness of learning devices integrated with local wisdom requires direct implementation in the classroom, focusing on the feasibility of learning, student activities, and challenges faced by teachers.

DISCUSSION

We recommend conducting further studies to assess the practicality and effectiveness of the booklet in actual classroom settings. Implementation across various schools in different regions would be beneficial to evaluate its adaptability and effectiveness in diverse contexts. We also suggest developing similar booklets for other biology topics, integrating relevant local wisdom. To maximize the booklet's potential in enhancing students' problem-solving skills, providing training for teachers on its effective use would be valuable. Gathering feedback from students and teachers after using the booklet could identify areas for improvement and refinement. Additionally, exploring the creation of digital versions could increase accessibility and interactivity. Longitudinal studies to assess the long-term impact of the booklet on students' environmental awareness and problem-solving skills would provide valuable insights for future educational strategies.

CONCLUSIONS

Based on the development of the booklet that has been carried out, it includes several components, namely content, linguistic, and presentation components that were validated through FGD activities, indicating that the developed booklet falls into the valid category. The validity of the booklet in these aspects indicates its potential to enhance the effectiveness of learning materials on Environmental Conservation and Change, especially in contexts that integrate local wisdom. Thus, the developed booklet not only meets validity standards but also has the potential to support the improvement of students' skills in contextual and meaningful biology learning.

ACKNOWLEDGMENT

We extend our sincere gratitude to all who contributed to this study. We extend our gratitude to the experts who provided valuable insights during the Focus Group Discussion to validate the booklet. We also thank our academic institution for facilitating this research and providing the necessary resources. The contributions of all these individuals and entities were essential to the successful development and validation of this innovative learning tool that integrates local wisdom into biology education.

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