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Design of a Literacy–Science Prototype Learning Model to Strengthen Main-Idea Comprehension through Texts on the Human Movement System in Elementary Students

Berlian Prida Agustin,[1]Marsya Alea Try Julieta,[2]

Alifa Bambang Ayyuni, [3] Anang Tri Laksono, [4] Hana Andriningrum, [5] Vit Ardhyantama, [6] Muhammad Imaduddin [7]

[1,2,3,4,5,6,7] Campus 5, State University of, Surabaya (UNESA), Indonesia

*Correspondence author: 24111744008@mhs.unesa.ac.id

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Abstract

The ability to identify the main idea is an essential reading comprehension skill that enables students to understand the information presented in a text. However, elementary school students often experience difficulties in identifying the main idea, particularly in texts containing science-related concepts. This study aimed to develop a *Science Literacy Board* as a learning medium that integrates Indonesian language and science learning through main idea identification activities using texts on the human movement system. This study employed a *Research and Development (R&D)* approach using the 3D model, which consists of the *Define, Design, and Develop* stages. The Define stage involved a needs analysis based on classroom observations, the Design stage focused on the development of the learning medium, and the Develop stage included product development and expert validation. Data were collected through observation and expert validation sheets and were analyzed descriptively. The findings revealed that students still encountered difficulties in identifying the main idea and comprehending science texts, while literacy and science skills had not yet been optimally integrated in classroom learning. The resulting product was a Science Literacy Board consisting of reading cards and main idea cards packaged in the form of an educational game. Expert validation indicated a feasibility score of 77%, categorized as *feasible with minor revisions*. Therefore, the Science Literacy Board has the potential to serve as an alternative integrated learning medium that supports students in identifying main ideas while simultaneously enhancing their understanding of the human movement system.

INTRODUCTION

Literacy is one of the fundamental competencies that should be developed from the elementary school level, as it plays a crucial role in supporting students' academic success. Literacy is not only related to reading and writing skills but also encompasses the ability to understand, interpret, and utilize information obtained from various sources (Putri Bungsu & Dafit, 2021). In Indonesian language learning, one of the essential reading skills that students need to master is the ability to identify the main idea. This skill enables students to comprehend the central information presented in a text and develop a more comprehensive understanding of the learning materials.

However, identifying the main idea remains a common challenge among elementary school students. Many students experience difficulties in recognizing the main idea of a paragraph because they tend to focus on specific details or individual sentences without understanding the overall meaning of the text. As a result, students are often unable to capture the central message conveyed in a passage, leading to suboptimal reading comprehension. This finding is consistent with the study conducted by Rahmawati and Roshayanti (2024), which reported that elementary school students still encounter difficulties in accurately identifying the main idea of a paragraph.

Similar challenges are also found in science learning. At the elementary school level, students are required to understand various scientific concepts through reading activities. One of the topics studied is the human movement system, which includes concepts related to bones, joints, muscles, and their functions. This topic is generally presented in the form of informational texts that require adequate reading comprehension skills for students to understand the concepts effectively. Reading comprehension plays a significant role in helping students acquire and process information presented in a text (Pannim et al., 2022).

Based on classroom observations, students were found to experience difficulties in identifying the main idea of a text. Some students tended to select the first sentence of a paragraph as the main idea without considering the overall content of the passage. Furthermore, science instruction on the human movement system primarily relied on textbooks and teacher explanations, resulting in limited integration between literacy skills and science learning. Consequently, students tended to memorize information rather than understand the key ideas contained in the texts. Difficulties related to the human movement system were also reported by Umiyati and Fakhriyah (2026), who found misconceptions regarding the human movement system among elementary school students.

One potential approach to addressing these challenges is the integration of literacy and science learning. Such integration allows students to learn scientific concepts while simultaneously developing reading comprehension skills within a

single learning activity. Through texts related to the human movement system, students can practice identifying the main idea while gaining a deeper understanding of scientific concepts. Integrating these two aspects is expected to create a more meaningful and contextualized learning experience.

Despite its potential benefits, learning media specifically designed to integrate main idea identification skills with the topic of the human movement system remain limited. Meanwhile, the use of appropriate learning media has been shown to enhance the quality of the learning process and students' understanding of instructional content (Jannah et al., 2025). Therefore, there is a need to develop learning media that effectively integrates literacy and science learning in an engaging manner suitable for elementary school students. Based on this need, the present study aims to develop a *Science Literacy Board* as a learning medium that assists students in identifying the main idea through texts related to the human movement system.

METHODS

This study used a Research and Development (R&D) approach with the 3D development model, consisting of three stages: Define, Design, and Develop.

The Define stage aimed to identify learning needs through curriculum analysis, content analysis, learner characteristics analysis, and learning needs analysis. Classroom observations were conducted to examine learning conditions, students' difficulties in identifying the main idea of reading texts and understanding texts containing science concepts, as well as the learning media used by teachers.

The Design stage involved formulating learning objectives, selecting content on the human movement system, and designing learning activities and materials that integrate literacy and science.

The Develop stage involved developing the Science Literacy Board prototype, conducting media expert validation, and revising the media based on the validator's feedback. The validation instrument consisted of 20 statements rated on a scale of 1–5. The statements covered the suitability of the media with learning objectives and student characteristics, its ability to support learning, ease of use, efficiency, safety, and overall media quality. The validation resulted in a score of 77 out of 100. The validator suggested providing more varied cards that could be adapted to students' cognitive levels.

Data were collected through classroom observations and a media expert validation instrument. Observation data were analyzed qualitatively through data reduction, data display, and conclusion drawing. Meanwhile, the validation results were analyzed descriptively based on the scores obtained from the validation instrument.

RESULTS AND DISCUSSION

A. NEEDS ANALYSIS

The observation results showed that students still experience difficulties in determining the main idea of a reading text. Most students tend to choose the first sentence of a paragraph as the main idea without understanding the overall content of the text. In addition, students still face difficulties in understanding reading materials containing science concepts, especially on the topic of the human movement system.

The learning process conducted by teachers is still dominated by the use of textbooks and direct explanations. Reading activities carried out by students have not been specifically directed toward training their ability to identify main ideas. This condition indicates the need for learning media that can integrate reading literacy skills with science learning so that students can understand the content of the reading materials while also comprehending the concepts being studied.

B. DESCRIPTION OF THE DEVELOPED PRODUCT

The product developed in this research is a Science Literacy Board designed to integrate Indonesian Language and Science learning for elementary school students. This media is used to train students' ability to determine main ideas through reading materials containing topics about the human movement system. In addition to functioning as a literacy medium, this board is also designed as an educational game so that students can learn actively and enjoyably. The Science Literacy Board consists of several main components, namely the media title, reading card placement area, main idea card placement area, and card storage basket. The display of the media is divided into two sections, namely the left side and the right side, which are used as places to attach reading cards and main idea cards.

This area division aims to make it easier for students to match the reading content with the appropriate main ideas. The media design uses a combination of bright colors, student illustrations, and attractive ornaments to increase students' attention and learning motivation. The use of various visual elements is designed to suit the characteristics of elementary school students who tend to prefer attractive and interactive learning media. The core part of the media consists of reading cards containing information about the human movement system and main idea cards that can be attached and removed repeatedly. Each reading card contains one paragraph of information that students must read and understand. The appearance of the board can be seen in Figure 1.



Figure 1. The Science Literacy Board

The reading cards contain information about the human movement system, while the main idea cards can be attached and removed repeatedly. Each reading card contains one paragraph of information that students must read and understand. After reading, students are asked to determine the appropriate main idea and then attach the main idea card to the area provided. This activity is designed to help students identify the main idea of a paragraph while also understanding the science concepts presented in the reading material.

In addition to serving as a literacy practice medium, the Science Literacy Board is also designed as a simple game. Students compete to find and match the main idea cards correctly within a specified time limit. Through this activity, students not only practice reading comprehension but also actively participate in the learning process. The appearance of the developed media can be seen in Figure 2.



Figure 2. Science Literacy Board for Attaching Reading Texts & Main Ideas

A. MEDIA EXPERT VALIDATION RESULTS

The Science Literacy Board media was validated by a media expert to determine its feasibility before being used in learning activities. The validation instrument consisted of 20 statements rated on a scale of 1–5. The assessment covered several aspects, including the suitability of the media with learning objectives and student characteristics, its ability to attract students' attention and increase learning motivation, its role in supporting learning activities, ease of use, efficiency, safety, and overall media quality.

The validation results showed variations in the scores across the 20 assessment statements. The ability of the media to motivate students, ease of use, and safety received a score of 5. Meanwhile, aspects related to students' enjoyment, learning feedback, practice activities, and suitability with the learning environment received a score of 3. These results indicate that although the media received positive assessments in several aspects, some areas still require improvement.

Table 1. Table of Media Expert Validation Results

Component	Result
Score obtained	77
Maximum score	100
Eligibility percentage	77%
Category	Valid/Appropriate (can be used with minor revisions)

As presented in Table 1, the Science Literacy Board media was reported to obtain a feasibility percentage of 77% and was categorized as valid or appropriate for use with minor revisions. The assessment results indicate that the media has strengths in supporting learning activities, particularly in terms of student motivation, ease of use, and safety. However, the lower scores in several statements suggest that improvements are needed to enhance students' learning experiences.

The validator recommended developing more varied cards to make the learning activities more complex and accommodate students' different cognitive levels. This feedback was used as a basis for revising the reading cards and main idea cards. Overall, the validation process provided feedback for improving the Science Literacy Board media as a learning medium that integrates main idea identification skills with the topic of the human movement system.

The Science Literacy Board is a learning medium that uses a board, reading cards, and main idea cards as its main components. The reading cards contain texts about the human movement system, while the main idea cards contain the key information corresponding to each text. The main characteristic of this medium lies

in the activity of matching the two types of cards. Through this activity, students are not only required to read the text but also to understand its content in order to identify the appropriate main idea.

This medium integrates literacy skills with science learning by using the human movement system as the reading topic. This integration allows students to practice reading comprehension while learning science concepts in a single learning activity. Therefore, the medium connects reading skills with subject-matter understanding, particularly in identifying important information and determining the main idea of a text.

Furthermore, the use of cards makes learning more interactive because students are directly involved in reading, selecting, and matching information. The medium can also be adapted to students' learning needs by varying the reading texts and main idea cards, ranging from simple texts to texts that require more complex comprehension. Therefore, the Science Literacy Board has three main characteristics: interactive card-based activities, the integration of literacy and science learning, and flexible materials that can be adapted to elementary school students' learning abilities.

CONCLUSION

This study developed the Science Literacy Board as an integrated learning medium for Indonesian language and science learning in elementary schools. The development process followed the Research and Development (R&D) approach using the 3D model, which consisted of the Define, Design, and Develop stages. The needs analysis revealed that students experienced difficulties in identifying the main idea of a paragraph, as they tended to select the first sentence without considering the overall meaning of the text. Students also faced challenges in understanding science-related reading materials, particularly those concerning the human movement system. These findings indicated the need for learning media that could connect reading comprehension activities with science content.

The developed Science Literacy Board consists of a board, reading cards, main idea cards, and a card storage basket. The media is designed as an educational game in which students read paragraphs about the human movement system, identify their main ideas, and match them with the appropriate cards. Through this design, the media provides opportunities for students to practice reading comprehension while learning science concepts in an interactive learning environment. Its main characteristics include the integration of literacy and science, interactive card-matching activities, and the flexibility to develop different reading materials and levels of difficulty.

Based on the media expert validation, the Science Literacy Board obtained a reported feasibility score of 77 out of 100, or 77%, and was categorized as feasible

for use with minor revisions. The validator recommended providing more varied cards to make the activities more complex and accommodate students' different cognitive levels. This feedback highlights the importance of further improving the media's content and learning activities. Overall, the study produced an alternative learning medium that can support the integration of main idea identification and science learning in elementary schools. However, its effectiveness in improving students' reading comprehension and understanding of science concepts has not yet been established and requires further investigation through classroom trials.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author(s).

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