



Development of a Problem Based Learning (PBL)-based science teaching module to improve learning outcomes on the topic of classification of living organisms at SMP Negeri 1 Likupang Selatan

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Abstract

This study aimed to develop a valid, practical, and effective PBL-based science teaching module on the topic of classification of living organisms to enhance the learning outcomes of students at SMP Negeri 1 Likupang Selatan. This research employed a Research and Development (R&D) approach utilizing the ADDIE model, which encompasses the stages of Analysis, Design, Development, Implementation, and Evaluation. The research subjects consisted of one content expert, one media expert, and Grade VII students of SMP Negeri 1 Likupang Selatan who participated in both limited and field trials. Data collection techniques included expert validation sheets, teacher and student practicality questionnaires, and learning outcome tests administered through pretests and posttests. The data were analyzed using percentage analysis to determine validity and practicality levels, and N-Gain analysis to measure module effectiveness. The findings revealed that the developed PBL-based science teaching module met the highly valid criteria, as evidenced by content expert assessment (97.14%) and media expert assessment (95.29%). The module also satisfied the highly practical criteria, based on the limited trial (93.23%), the field trial (94.77%), and teacher responses (93.85%). The effectiveness of the module was demonstrated by an improvement in student learning outcomes, with a mean N-Gain value of 0.71, categorized as high. Consequently, the PBL-based science teaching module on the topic of classification of living organisms is declared valid, practical, and effective, rendering it suitable for use in science instruction at SMP Negeri 1 Likupang Selatan.

Keywords: Science teaching module, Problem Based Learning (PBL), Classification of living organisms, Learning outcomes, ADDIE

Introduction

Science education at the junior secondary school level plays a pivotal role in developing students' scientific reasoning abilities, science process skills, and problem-solving competencies. Within the framework of the *Kurikulum Merdeka* (Independent Curriculum), science instruction extends beyond mere conceptual mastery to emphasize students' capacity to construct knowledge through meaningful learning experiences, inquiry-based activities, and problem-solving related to everyday life. Consequently, the design of science learning processes must actively encourage students to seek, discover, and build their own understanding of scientific concepts. Recent studies have indicated that science instruction continues to face challenges in enhancing students' critical thinking and problem-solving abilities. Teacher-centered instructional approaches tend to position students as passive recipients of information, promoting rote memorization over comprehension of how scientific concepts relate to real-world phenomena. This situation contributes to low levels of higher-order thinking skills and student learning outcomes, despite these competencies being central to the *Kurikulum Merdeka* (Adhiatma, et al.; Kamil, et al., 2024; Mokalau, et al., 2023; Paat, et al., 2025) [1, 12, 20, 25].

A significant topic in junior secondary science education is the classification of living organisms. This topic serves as a foundation for understanding biological concepts at subsequent educational levels by enabling students to explore biodiversity through observing, comparing, and grouping organisms based on specific characteristics. Through the study of organism classification, students are expected to grasp the relationships among organisms and recognize the importance of biodiversity in daily life. Nevertheless, students frequently perceive the classification of living organisms as a difficult topic. These difficulties arise from the abundance of scientific terminology, abstract concepts, and the need for precise identification of organism characteristics. When instruction relies solely on verbal transmission, students tend to struggle with deep conceptual understanding, resulting in lower learning achievement (Domits, et al., 2025; Tumbel, et al., 2022; Yli-Panula, et al., 2018; Darumba, et al., 2025) [8, 38, 40, 7].

Preliminary observations conducted at SMP Negeri 1 Likupang Selatan revealed that science instruction on the topic of organism classification remains dominated by conventional teaching materials and teacher-centered methods. Students typically receive information through teacher explanations and textbooks, without learning activities that encourage

independent exploration of concepts. This condition has led to suboptimal student engagement in the learning process, indicating a need for improvement in both conceptual understanding and learning outcomes. One instructional model that can address these challenges is Problem Based Learning (PBL). The PBL model positions contextual problems as the starting point of learning, prompting students to identify problems, seek relevant information, conduct investigations, and develop solutions both independently and collaboratively. Through this process, students not only acquire knowledge but also develop critical thinking, collaboration, communication, and problem-solving skills essential for 21st-century learning (Kembuan, et al., 2019; Paat, et al., 2025; Mantiri, et al., 2025) [13, 25, 19].

Numerous studies have reported positive effects of PBL implementation on student learning outcomes and thinking skills. Zachawerus, Pendong, and Tanor (2021) [42] documented that the use of PBL significantly improved student learning achievement. Similarly, Hesy, Poluakan, and Rungkat (2023) [10] found that science instruction employing PBL effectively enhanced the critical thinking skills of junior secondary students. In addition to the instructional model, the success of the learning process is also influenced by the availability of teaching materials tailored to student characteristics. A teaching module is a form of instructional material that can facilitate both independent and structured classroom learning. Systematically designed modules can assist students in gradually understanding concepts, provide more meaningful learning experiences, and increase student engagement in the learning process. In the context of teaching material development, Tengor, Paat, and Suriani (2023) [36] reported that a PBL-based science worksheet developed for junior secondary science instruction was deemed highly appropriate for use. Similar findings were reported by Toe, Rungkat, and Rogahang (2023) [37], who stated that a PBL-based e-module developed using the ADDIE model demonstrated a high level of feasibility and received positive responses from students.

These findings suggest that integrating PBL into teaching materials has the potential to improve the quality of science instruction. However, based on the preliminary observations at SMP Negeri 1 Likupang Selatan, no PBL-based science teaching module specifically developed for the topic of organism classification, aligned with student characteristics and the school's instructional needs, is currently available. Therefore, the development of a PBL-based science teaching module on the classification of living organisms is considered necessary as an alternative instructional material to enhance student activeness, facilitate student-centered learning, and improve science learning outcomes. Based on the foregoing explanation, the researcher is interested in conducting a developmental study entitled: "Development of a PBL-Based Science Teaching Module on the Classification of Living Organisms to Improve Student Learning Outcomes at SMP Negeri 1 Likupang Selatan."

Research methodology

A. Research design

This study constitutes research and development (R&D), aimed at producing a tangible product: a PBL-based science teaching module on the topic of classification of living organisms for students of SMP Negeri 1 Likupang Selatan. The R&D approach was employed to generate educational products that are valid, practical, and effective through a systematic sequence of development stages. The development model adopted in this study is the ADDIE model (Analysis, Design, Development, Implementation, Evaluation), as articulated by Branch (2009). The ADDIE model was selected due to its systematic and flexible phases, as well as its widespread application in the development of instructional materials (Patibang, et al., 2025; Domits, et al., 2025; Sondakh, et al., 2021) [26, 8, 34].

B. Research setting and timeline

The research was conducted at SMP Negeri 1 Likupang Selatan. The study took place during the even semester of the 2025/2026 academic year, encompassing the needs analysis phase, product development, expert validation, product trials, and the preparation of the research report.

C. Development model

The development model employed is the ADDIE model proposed by Branch (2009). This model comprises five stages:

a) Analysis

The analysis phase aimed to identify instructional needs, including:

- Curriculum analysis.
- Analysis of student characteristics.
- Analysis of the topic "classification of living organisms."
- Analysis of teaching material requirements.
- Analysis of problems in science instruction at the school.

The results of this analysis served as the foundation for designing a teaching module aligned with student needs.

b) Design

This phase involved:

- Formulation of learning outcomes (*Capaian Pembelajaran*).
- Formulation of learning objectives.
- Design of PBL-based learning activity sequences.
- Development of research instruments.
- Preparation of the initial teaching module design.

c) Development

The development phase entailed:

- Constructing the teaching module according to the design.
- Developing content on the classification of living organisms.
- Designing PBL-based learning activities.
- Developing learning assessments.
- Conducting validation by content experts and media experts.

Feedback from validators was used to revise the product until a module deemed suitable for use was obtained.

d) Implementation

The implementation phase involved a limited trial with students of SMP Negeri 1 Likupang Selatan to determine the practicality and effectiveness of the developed module.

e) Evaluation

The evaluation phase was conducted throughout the entire development process to ascertain product quality based on validity, practicality, and effectiveness. Formative evaluation occurred during the development process, while summative evaluation was carried out after product implementation (Patibang, et al., 2025; Rembet, et al., 2026 Sondakh, et al., 2021; Zachawerus, et al., 2025) [27, 32, 34, 41].

D. Research subjects

The research subjects consisted of:

- **Expert validators:** comprising one science content expert and one instructional media expert.
- **Students:** Grade VII students of SMP Negeri 1 Likupang Selatan who participated in the teaching module trial.
- **Science teacher:** who acted as a user of the teaching module, providing assessments regarding the practicality of module use in instruction.

E. Developed product

The product developed in this study is a PBL-based science teaching module on the classification of living organisms. The module components include:

- Module identity
- Learning outcomes (*Capaian Pembelajaran*)
- Prerequisite competencies
- *Profil Pelajar Pancasila* (Pancasila Student Profile)
- Facilities and infrastructure.
- Target students
- Approach, learning model, methods
- Learning objectives
- Meaningful understanding
- Trigger questions
- PBL-based learning activities
- Assessment rubric
- Student worksheets
- Assessments
- Learning materials
- Glossary
- References

F. Data collection techniques

Research data were obtained through:

- **Validation questionnaires:** used to obtain product validity data from expert validators.
- **Practicality questionnaires:** used to obtain responses from the teacher and students regarding the use of the module.
- **Learning outcome tests:** used to obtain data on module effectiveness through pretests and posttests.

G. Research instruments

a) Expert validation sheets

The aspects assessed included:

- Content feasibility
- Language quality
- Presentation quality
- Graphical quality

b) Practicality questionnaire

The aspects assessed included:

- Ease of use
- Visual appeal
- Clarity of instructions
- Feasibility of implementation

Results

This study produced a PBL-based science teaching module on the topic of classification of living organisms for students of SMP Negeri 1 Likupang Selatan. The module was developed using the ADDIE model, comprising five stages: Analysis, Design, Development, Implementation, and Evaluation. The application of the ADDIE model in developing instructional materials has been demonstrated to yield systematic, valid, practical, and effective products for 21st-century learning (Aldoobie, 2021; Kurniawan & Kuswandi, 2022) [3, 16]. The development stages are described as follows:

1. Analysis stage

The analysis stage aimed to identify the needs for developing a PBL-based science teaching module on the classification of living organisms.

a) Curriculum analysis

Curriculum analysis was conducted on the *Kurikulum Merdeka* (Independent Curriculum) implemented at SMP Negeri 1 Likupang Selatan. The results indicated that the topic of classification of living organisms falls within Phase D and requires students to identify the characteristics of living organisms and classify organisms based on similarities and differences in their traits. Beyond conceptual mastery, instruction is also directed toward developing critical thinking, problem-solving, communication, and collaboration skills. Consequently, teaching materials that facilitate active student engagement in the learning process are necessary.

b) Analysis of student characteristics

Based on observations and interviews with the science teacher, the characteristics of Grade VII students were identified as follows:

- Preference for learning that incorporates images and group activities
- High interest in natural phenomena in their surrounding environment
- Need for teaching materials that can be studied independently
- Persistent difficulties in understanding scientific terminology within the topic of organism classification.

These findings indicate the need for a module presented in simple language, with appealing illustrations and learning activities that actively involve students.

c) Analysis of the topic "Classification of Living Organisms"

The topic of classification of living organisms encompasses:

- Characteristics of living organisms in the surrounding environment
- Classification of living organisms
- Foundations of biological classification
- Binomial nomenclature
- Five-kingdom classification system
- Taxonomic ranks
- Grouping of living organisms.

This topic contains numerous abstract concepts and scientific terms, necessitating a contextual, problem-based learning approach to facilitate student comprehension.

d) Analysis of teaching material needs

Observations revealed that the teaching materials in use consisted of standard textbooks and simple worksheets. No PBL-based teaching module was available for independent student use. This condition resulted in students largely receiving information from the teacher rather than constructing knowledge through learning activities.

e) Analysis of problems in science instruction

Preliminary observations identified several problems:

- Instruction remained teacher-centered.
- Student learning activity was low.
- Critical thinking skills had not developed optimally.
- Student learning outcomes on the topic of organism classification required improvement.

These needs analysis results formed the basis for developing the PBL-based science teaching module.

2. Design stage

The design stage was conducted based on the needs analysis results.

a) Formulation of learning outcomes (*Capaian Pembelajaran*)

Learning outcomes were formulated according to the *Kurikulum Merdeka* Phase D for the element of living organisms and their environment.

b) Formulation of learning objectives

Learning objectives were articulated to enable students to:

- Through observation, compare living and non-living things based on observed characteristics using critical thinking.
- Through observation and group discussion, analyze the five-kingdom classification of living organisms collaboratively.

c) Design of PBL-based learning activity sequences

Learning activities were designed following the PBL syntax:

- Orientation to the problem
- Organizing students for study
- Guiding inquiry
- Developing and presenting artifacts and exhibits
- Analyzing and evaluating the problem-solving process.

d) Development of research instruments

The instruments developed included:

- Content expert validation sheet
- Media expert validation sheet
- Student response questionnaire
- Teacher response questionnaire
- Pretest questions
- Posttest questions.

e) Initial module design

The module components designed included:

- Cover
- General information
- Core components
- Learning activities
- Assessment rubric
- Learning materials
- Student worksheets
- Formative assessment
- Glossary
- References

3. Development stage

The development stage involved constructing the module according to the design, followed by validation by content and media experts. Content validation was performed by Dr. Jovialine A. Rungkat, [M.Si.](#), Coordinator of the Master of Science Education Program, Postgraduate School, UNIMA. Media validation was performed by Prof. Dr. Herry M. Sumampouw, M.Pd. Each validator conducted two validation sessions: the first assessment on the initial product and the second after revisions. The validation results were then calculated to obtain validity percentages according to the formula presented in Chapter III, after which the validity category corresponding to the obtained percentage was determined.

a) Content expert validation

First validation phase

Table 1: Results of first content expert validation

Aspect	Value
Score obtained	70
Maximum score	105
Percentage	66.67%
Category	Moderately Valid

The first validation phase results indicated that the module fell into the moderately valid category, necessitating several revisions.

Validator suggestions

- Clarify the learning objectives.
- Add illustrative images.
- Improve the logical sequence of content presentation.
- Strengthen problem-solving activities according to PBL syntax.

Second validation phase

Following revisions, the module was re-validated.

Table 2: Results of second content expert validation

Aspect	Value
Score obtained	102
Maximum score	105
Percentage	97.14%
Category	Highly valid

The increase in validity was calculated as:

$$97.14\% - 66.67\% = 30.47 \text{ percentage points.}$$

These results indicate that the module met the highly valid criteria.

b) Media expert validation**First validation phase****Table 3:** Results of first media expert validation

Aspect	Value
Score obtained	54
Maximum score	85
Percentage	63.53%
Category	Moderately Valid

Validator suggestions

1. Improve the cover design
2. Adjust image layouts
3. Enhance font consistency
4. Increase the visual appeal of the module.

Second validation phase**Table 4:** Results of second media expert validation

Aspect	Value
Score obtained	81
Maximum score	85
Percentage	95.29%
Category	Highly valid

The increase in media validity was:

$$95.29\% - 63.53\% = 31.76 \text{ percentage points. Thus, the module was declared highly valid from the media perspective.}$$

4. Implementation stage

Implementation was conducted through a limited trial and a field trial.

a) Limited trial

The limited trial involved 10 students.

Table 5: Results of module practicality in the limited trial

Aspect	Value
Mean percentage	93.23%
Category	Highly practical

These results indicate that students responded very positively to the use of the module.

b) Field trial

The field trial involved 20 students.

Table 6: Results of module practicality in the field trial

Aspect	Value
Mean percentage	94.77%
Category	Highly practical

This percentage indicates that the module was easy to use, engaging, and helpful for students in understanding the learning material.

c) Teacher response**Table 7:** Results of module practicality based on teacher response

Aspect	Value
Score obtained	61
Maximum score	65
Percentage	93.85%
Category	Highly Practical

The teacher stated that the module greatly facilitated instruction and was appropriate to student characteristics.

d) Module effectiveness

Module effectiveness was measured using the N-Gain score based on pretest and posttest results.

Table 8: Results of N-gain analysis

Component	Value
Mean pretest score	45.25
Mean posttest score	84.50
Mean N-Gain	0.71
Category	High

An N-Gain value of 0.71 indicates that use of the module resulted in improved learning outcomes in the high category. According to recent studies, an N-Gain value ≥ 0.70 signifies high instructional effectiveness in enhancing students' conceptual mastery (Putra, Sari, & Ningsih, 2022; Lestari & Rahmawati, 2022) [30, 18].

5. Evaluation stage

Evaluation was conducted formatively and summatively.

a) Formative evaluation

Formative evaluation was carried out at each development stage through:

- Needs analysis
- Module design revisions
- Content expert validation
- Media expert validation

Feedback from validators was used to refine the product prior to trials.

b) Summative evaluation

Summative evaluation was conducted after product implementation.

Table 9: Summary of summative evaluation results

Aspect	Percentage/Value	Category
Content expert validity	97.14%	Highly valid
Media expert validity	95.29%	Highly valid
Student practicality (limited trial)	93.23%	Highly practical
Student practicality (field trial)	94.77%	Highly practical
Teacher practicality	93.85%	Highly practical
Effectiveness (N-Gain)	0.71	High

Discussion

This discussion focuses on the quality of the PBL-based science teaching module developed through the ADDIE model, examined in terms of validity, practicality, and effectiveness. The results indicate that the developed module satisfies all product feasibility criteria, rendering it appropriate for use in science instruction on the topic of classification of living organisms at SMP Negeri 1 Likupang Selatan.

1. Analysis stage

The analysis stage constitutes the initial phase that critically determines the success of product development, as it involves a comprehensive identification of instructional needs. The curriculum analysis revealed that the *Kurikulum Merdeka* emphasizes student-centered learning, the development of 21st-century competencies, and the strengthening of critical thinking and problem-solving abilities. Consequently, the development of a PBL-based teaching module is deemed consistent with the demands of the current curriculum.

The analysis of student characteristics indicated that students at SMP Negeri 1 Likupang Selatan exhibit greater interest in learning that involves hands-on activities, group discussions, and the use of engaging visual media. Furthermore, students continue to experience difficulties in understanding scientific terminology within the topic of organism classification. These conditions underscore the need for teaching materials that not only present content systematically but also facilitate students' construction of understanding through meaningful learning activities. This finding aligns with the results reported by Weni, Paat, and Tumewu (2024) ^[39], who stated that PBL-based teaching materials can accommodate students' learning needs through activities requiring active engagement in the learning process. That study demonstrated that students more readily comprehend science concepts when instruction is connected to authentic problems relevant to their daily lives.

The analysis of teaching material needs also revealed that the school lacks a PBL-based teaching module that students can

use independently. Therefore, the development of such a module in this study represents a relevant solution to support the implementation of the *Kurikulum Merdeka* while simultaneously improving the quality of science instruction (Zuhrudin, et al., 2025; Paat & Mokal, 2023; Rantung, et al., 2025) ^[43, 21, 31].

2. Design stage

The design stage was conducted based on the previously obtained needs analysis results. The module was designed by integrating the PBL syntax into all learning activities, ensuring that students not only study the concepts of organism classification but also engage in identifying problems, gathering information, conducting investigations, and formulating solutions to the problems presented.

The formulation of learning objectives, learning activities, assessments, and research instruments was carried out systematically so that all instructional components mutually support the achievement of the established learning outcomes. Such structured module development is essential because it can assist students in learning independently and progressively according to their individual abilities. The results of this study support the findings of Tengor, Paat, and Suriani (2023) ^[36], who concluded that instructional materials designed based on PBL syntax can create more structured learning experiences and promote active student engagement in science learning. Additionally, the module design considered visual aspects, language use, and material readability to align with the characteristics of junior secondary students. This is important because the quality of instructional material design can influence learning motivation and the ease with which students comprehend the content.

3. Development stage

The development stage aimed to produce a module that meets validity criteria based on expert assessments. The content expert validation results showed that in the first phase, the module obtained a validity percentage of 66.67%, falling into the moderately valid category. These results indicate that while the module content was generally aligned with the learning objectives, several aspects required improvement, particularly regarding the clarity of learning objectives, the presentation of illustrations, and the strengthening of problem-based learning activities. Following revisions based on the validator's suggestions, the validity percentage increased to 97.14%, categorized as highly valid. An increase of 30.47 percentage points demonstrates that the revision process contributed significantly to the quality of the developed product. In the media expert validation, the validity percentage increased from 63.53% to 95.29%. This increase indicates that improvements in appearance, layout, color usage, and design consistency successfully enhanced the overall quality of the instructional media.

These results are consistent with the study by Toe, Rungkat, and Rogahang (2023) ^[37], who obtained a very high validity level in the development of a PBL-based e-module for science instruction. That study demonstrated that validation and

revision processes are essential stages to ensure that the developed product possesses adequate quality before being used in instruction. The high validity levels obtained in this study indicate that the developed teaching module satisfies the criteria of content appropriateness, language quality, presentation quality, graphical quality, and alignment with the PBL syntax.

4. Implementation stage

The implementation stage was conducted to determine the practicality and effectiveness of the developed module. Practicality was measured through student and teacher responses to the use of the module in instruction.

The limited trial results showed that the module achieved a practicality percentage of 93.23%, categorized as highly practical. Following the field trial, the practicality percentage increased to 94.77%, also in the highly practical category. Furthermore, the teacher response yielded a practicality percentage of 93.85%, categorized as highly practical. These high practicality levels indicate that the module is easy to use, engaging, provides clear instructions, and assists students in understanding the topic of organism classification. Students also responded positively to the problem-based learning activities contained in the module. These results are supported by the research of Weni, Paat, and Tumewu (2024) [39], who reported that PBL-based instructional materials received positive responses from students due to their ability to enhance engagement and learning motivation.

High practicality indicates that the module can be used effectively by both teachers and students without significant obstacles during instructional implementation.

5. Module effectiveness

Module effectiveness was measured using the N-Gain index based on student pretest and posttest results. The analysis revealed that the mean pretest score of 45.25 increased to 84.50 on the posttest. The calculated N-Gain yielded a mean value of 0.71, which falls into the high category. This improvement indicates that the use of the PBL-based teaching module enhances students' conceptual mastery of the topic of organism classification. An N-Gain value in the high category suggests that students not only experienced an increase in test scores but also achieved better conceptual understanding after instruction using the developed module.

These results align with the study by Zachawerus, Pendong, and Tanor (2021) [42], which found that PBL implementation significantly improved student learning outcomes. Similar results were reported by Hesy, Poluakan, and Rungkat (2023) [10], demonstrating that PBL-based instruction effectively enhanced the critical thinking skills of junior secondary students. Theoretically, the improvement in learning outcomes occurs because PBL provides opportunities for students to construct knowledge through direct experience in solving problems. Through investigative activities, discussions, and presentations of problem-solving outcomes, students become more active in knowledge construction, leading to deeper conceptual understanding (Kindangen, et al., 2023; Paat, et al., 2024; Kosakoy, et al., 2025; Pontoh, et al., 2024) [14, 23, 15, 28].

6. Evaluation stage

Evaluation was conducted continuously throughout the product development process. Formative evaluation was carried out at each ADDIE stage through needs analysis, design, expert validation, product revision, and module trial implementation. Summative evaluation was conducted after implementation to determine the final quality of the product.

Based on the evaluation results, the PBL-based science teaching module achieved a content expert validity level of 97.14%, a media expert validity level of 95.29%, student practicality of 94.77%, teacher practicality of 93.85%, and effectiveness with an N-Gain value of 0.71. These results indicate that the developed module satisfies the three main criteria of development research: validity, practicality, and effectiveness. Consequently, the PBL-based science teaching module on the topic of classification of living organisms is deemed suitable for use as instructional material in science education at SMP Negeri 1 Likupang Selatan.

Overall, the findings of this study reinforce previous research demonstrating that integrating PBL into teaching materials can enhance the quality of science instruction. The novelty of this study lies in the development of a PBL-based science teaching module on the topic of classification of living organisms tailored to the characteristics of students at SMP Negeri 1 Likupang Selatan, which has been empirically shown to meet the criteria of validity, practicality, and effectiveness.

Conclusion

Based on the findings of the research and development of a PBL-based science teaching module on the topic of classification of living organisms at SMP Negeri 1 Likupang Selatan, the following conclusions can be drawn. The development process of the PBL-based science teaching module was conducted using the ADDIE model, comprising the stages of analysis, design, development, implementation, and evaluation. All stages were executed systematically, resulting in a learning product that aligns with student needs. The developed PBL-based science teaching module demonstrated a very high level of validity, as evidenced by content expert assessment (97.14%) and media expert assessment (95.29%), thus falling into the highly valid category. The developed PBL-based science teaching module exhibited a very high level of practicality, based on student responses from the limited trial (93.23%), the field trial (94.77%), and teacher responses (93.85%), placing it in the highly practical category. The developed PBL-based science teaching module proved effective in improving student learning outcomes, with a mean N-Gain value of 0.71, which falls into the high category. Consequently, the developed PBL-based science teaching module on the topic of classification of living organisms is deemed suitable for use in science instruction at SMP Negeri 1 Likupang Selatan.

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