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The Effectiveness of the Problem Based Learning Model Assisted by News on Ecosystem Material on Students Conceptual Understanding and Collaboration Skills at SMAN 6 Tangerang

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Abstrak

Students' low concept understanding and collaboration skills are one of the problems in the learning process, students still cannot formulate solutions to problems given by the teacher and cannot collaborate well. The Merdeka Curriculum can be an alternative solution to change learning to be more innovative and student-focused. One of the key aspects of the Merdeka Curriculum is its emphasis on problem-solving oriented learning related to real-life situations and the development of collaboration through joint problem solving, namely through the use of the news-assisted Problem Based Learning model. The purpose of this study is to analyze the effectiveness of news-assisted Problem Based Learning on students' conceptual understanding and collaborative skills. The method used in this study is quantitative, located at SMAN 6 Tangerang. The population in this study is all 10th grade students at SMA Negeri 6 Tangerang in the academic year 2025/2026. The research sample was taken using purposive sampling techniques. The research method used was a pre-experimental method with a One-Group Pretest-Posttest Design. This study was conducted by measuring concept understanding using a test sheet administered before the treatment (pretest) and after the treatment (posttest), measuring collaboration skills using an observation sheet conducted by an observer, a student response questionnaire on the learning model, and a learning implementation assessment sheet conducted by the biology teacher. The results of this study are: (1) there was an increase in KKTP ecosystem material after treatment, namely 79%, (2) the N-Gain value was 0.63, which is in the moderate category, (3) there was an increase in collaboration at each meeting, and (4) the results of student responses to news-assisted Problem Based Learning showed a score of 82%, which is in the very good category. Based on these findings, it can be concluded that the news-assisted Problem-Based Learning model for ecosystem material is effective in enhancing students' conceptual understanding and collaborative skills.

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INTRODUCTION

The Merdeka Belajar curriculum is the latest curriculum in Indonesia, aiming to change the approach to learning to be more innovative and student-centered. This curriculum aims to improve students' understanding of various concepts and build high-level thinking skills while honing their creativity in the field of science (Indarta *et al*., 2022).

In implementing the Merdeka Curriculum in Indonesia's education system, teachers must innovate to create a 21st-century generation, namely a generation that possesses the 4C skills: Communication, Collaboration, Critical Thinking and Problem Solving, and Creativity and Innovation, in order to address challenges (Pertiwi *et al*., 2023).One of the key aspects of the Merdeka Curriculum is the emphasis on problem-solving oriented learning (Nisak & Susantini, 2023).

In fact, based on the results of international studies such as the Programme for International Student Assessment (PISA), Indonesian students' problem-solving skills, particularly in the context of science literacy, are still below international standards. In the latest participation year, Indonesia ranked 62nd out of 70 countries, with an average score of 403 compared to the international average of 493 (Simatupang & Ionita, 2020). This condition shows that there are still major challenges in improving the quality of learning in mastering material and developing higher-order thinking skills, including problem-solving and collaboration skills.

Based on interviews conducted with biology teachers, it appears that the implementation of the Merdeka Curriculum has not been fully maximized. Although discovery-based learning models have been used, teachers methods are still frequently applied because they are considered easy to implement. The learning media used in teaching are PowerPoint presentations and textbooks. This indicates that the learning approach has not yet fully encouraged active student engagement. Teachers also stated that students' conceptual understanding and collaborative skills are still relatively low.

Based on these issues, a learning approach is needed that can encourage student activity, promote group interaction, and hone their ability to understand concepts and solve problems. One relevant learning model is Problem-Based Learning. This model emphasizes the active role of students in the learning process through real problem solving and group discussions One relevant learning model is Problem-Based Learning. This model emphasizes the active role of students in the learning process through real problem solving and group discussions (Simatupang & Ionita, 2020). In the Problem-Based Learning model, students can improve their thinking skills as part of the problem-solving process and draw conclusions based on their understanding (Anugraheni, 2018).

Problem-based learning models can be strengthened through media that support real-life contexts, such as online news covering ecosystem issues. News, as a medium of factual and current information, can be used as a stimulus for problem-based learning, making learning more contextual and meaningful. The use of news in learning allows students to understand the connection between the material and real life and fosters interest in the learning process. This news can be used in Problem-Based Learning with the aim of improving students' conceptual understanding (Astuti *et al*., 2016).

Learning often focuses on memorizing concepts rather than a deep understanding of those concepts, so students tend to find it difficult to communicate with their groups (Aristawati *et al*., 2018). In the Problem-Based Learning model implemented in groups, collaborative skills develop because students are required to interact, share ideas, and help each other in solving problem-based tasks (Chang *et al*., 2022).

The implementation of the Problem-Based Learning model can enhance students' collaboration skills through group discussion activities that involve interaction and cooperation among students. Through the Problem-Based Learning model, students are expected to actively contribute to the learning process in the classroom and engage in collaborative problem-solving (Hartina *et al*., 2022).

Based on the background described above, it is necessary to examine the effectiveness of news-assisted Problem Based Learning on students' conceptual understanding and collaborative skills in ecosystem material.

RESEARCH METHOD

This research was conducted at SMAN 6 Tangerang in the even semester of the academic year 2025/2026. The research population consisted of all students of class X at SMAN 6 Tangerang, comprising 11 classes, namely classes X.1 to X.11. The sampling technique used was purposive sampling. The sample consisted of 3 classes, namely classes X.6, X.7, and X.8, with a total of 112 students. The approach used in this study is a quantitative approach. The research design employed a Pre-Experimental design with a One Group Pretest-Posttest Design. Data collection in this study includes understanding of concepts, students' collaboration skills, and a questionnaire on students' responses to the Problem-Based Learning model assisted by news.

RESULTS AND DISCUSSION

The purpose of this study was to analyze the effectiveness of the news-assisted Problem Based Learning model on ecosystem material in terms of students' conceptual understanding and collaboration skills. The effectiveness of the news-assisted Problem Based Learning model on ecosystem material is measured by achievement based on predetermined effectiveness indicators, namely (1) classical learning completeness ≥ 70% with a learning objective achievement criterion (KKTP) of 75. (2) N-Gain test results obtained in the moderate category. (3) There was an increase in collaborative skills at each meeting. (4) Student responses to the Problem-Based Learning model assisted by news were categorized as very good.

Students Conceptual Understanding

Student concept comprehension data was obtained by conducting pre-tests and post-tests. Pretest data was obtained before teaching the ecosystem material. Posttest data was obtained after teaching was completed. The test instrument used multiple-choice questions to be answered by students. After analyzing the understanding, the number of students who completed the learning, the number of students who did not complete the learning, the percentage of classical learning completion or the percentage of students who achieved the KKTP score of 75, and the percentage of students who did not achieve the KKTP score of 75 were obtained. A summary of the learning outcomes of the students in the three classes studied is presented in Figure 1.

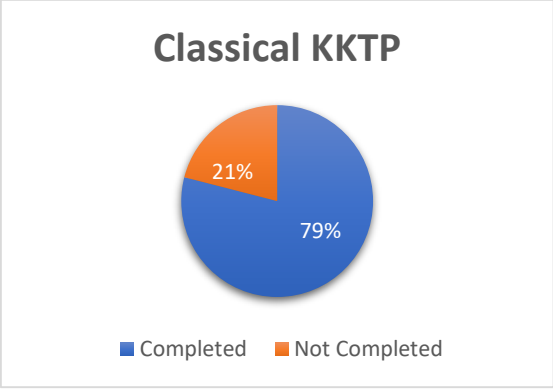

Figure 1 Average Percentage of Student KKTP Completion at the Time of Posttest

Figure 1 shows that the news-assisted Problem Based Learning model applied to ecosystem material has achieved success indicators (classical mastery reaching ≥70%). Based on Table 1, it is known that there are still students who have not met the KKTP value of 75. According to Gagne's information processing theory, the learning process involves the reception of information, which is then processed to produce learning outcomes. Students' failure to achieve mastery in learning can be attributed to internal or external factors that prevent them from processing the information provided by the teacher effectively, resulting in

learning outcomes below the minimum KKTP. Internal conditions encompass everything that occurs within an individual and plays a crucial role in helping them understand and master learning materials. Meanwhile, external conditions are stimuli from the surrounding environment that influence an individual's learning process (Rehalat, 2016).

The N-Gain test is a test that can be used to determine the effectiveness of the use of treatment in a study. The N-Gain test in this study was used to determine the increase in students' conceptual understanding after using the news-assisted Problem-Based Learning model. The results of the N-Gain test can be seen in Table 1.

Table 1 Results of N-Gain Tests of Students Pretest

	Pretest average score	*Posttest* average score	*N-Gain*	Category
Pretest-Posttest	47,78	80,35	0,63	Moderate

Based on Table 1 showing the results of the N-Gain test, it was found that there was an increase in students' conceptual understanding in the moderate category, which means that the news-assisted Problem-Based Learning model is effective in improving students' conceptual understanding. This is supported by the research of Hidayat et al. (2022), which found that using the Problem-Based Learning model can make students more active. This is because learning with the Problem-Based Learning model can arouse students' interest, thereby generating stimuli for independent thinking regarding the problems explained by the teacher. This is also supported by the research of Nulhakim et al. (2024), which states that the Problem-Based Learning model is effective for students' cognitive learning outcomes. Learning outcomes can also be used to assess students' conceptual understanding in the learning process.

Students' conceptual understanding of ecosystem material using the Problem-Based Learning model assisted by news can be seen in Figure 2.

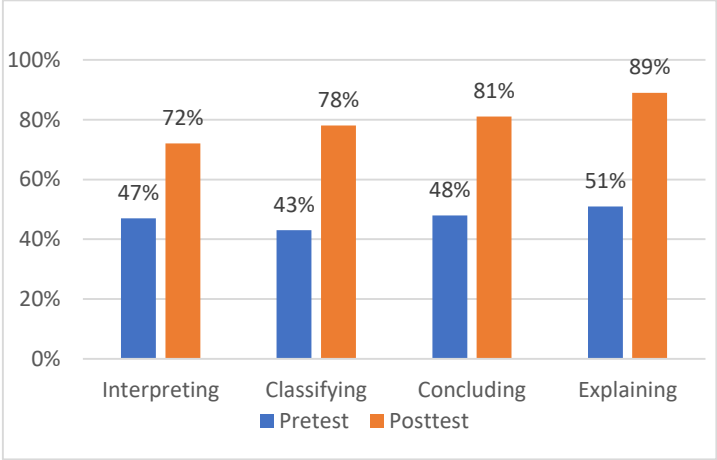

Figure 2 Recapitulation of Students Conceptual Understanding

Based on Figure 2, it is known that the application of the news-assisted Problem Based Learning model can improve students' conceptual understanding in interpreting, classifying, concluding, and explaining indicators. This is supported by the results of research by Yulianti & Gunawan (2019), which states that the application of the Problem Based Learning model contributes to improving students' conceptual understanding. The role of the news-assisted Problem-Based Learning model is that students are

required to find their own answers to the questions posed by using their thinking skills so that a concept about the material being studied is formed within the students, so that during the learning activity, students will use their thinking skills to the maximum.

The indicator requires students to have more complex thinking skills because it involves analyzing information that is not specifically conveyed. This indicator showed the lowest improvement because students were not yet able to fully represent phenomena related to problem orientation regarding ecosystems. According to Murni et al. (2017), students can interpret information through understanding and giving meaning based on related theories.

The classification indicator requires students to perform grouping. Through this learning model, students can be encouraged to examine information through news, identify important information, and then classify information scientifically. With this, students can map problems and classify arguments. According to Nurdiansyah et al. (2024), students must also have the ability to define examples, so that they can absorb the information and classify it.

This conclusion indicator measures students' ability to draw conclusions based on the information obtained. In this study, students can draw conclusions based on the phenomena presented in the problem orientation, namely in the form of solutions. According to Trianggono (2017), in drawing conclusions, students need to understand concepts to relate one concept to another.

The indicator with the highest increase is the explaining indicator. This indicator measures students' ability to elaborate on a concept based on the knowledge they have understood. The indicator of explaining tends to have the highest achievement percentage compared to other indicators. In this study, students can re-explain information about cause and effect based on the phenomena given about ecosystem material. According to Suratman (2012), students are able to relate one concept to another and can present arguments to explain that some facts are the result of other facts.

Student Collaboration Skills

Data on students' collaboration skills includes observation sheets on collaboration skills during discussions and presentations conducted by observers during two meetings, namely the second meeting and the third and fourth meetings. Students' collaboration skills were observed based on five indicators, namely active participation in groups, productive cooperation, responsibility, flexibility, and mutual respect. The results of observations on students' collaboration skills in the news-assisted Problem-Based Learning model. A summary of students' collaboration skills in the second meeting and the third and fourth meetings is presented in Figure 3.

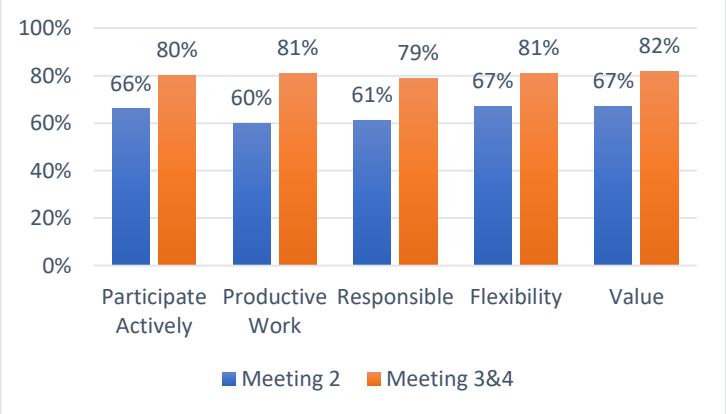

Figure 3 Recapitulation of Student Collaboration Skills

Based on Figure 3, it can be seen that in the second and third and fourth meetings, each indicator improved in the third and fourth meetings after the implementation of the news-assisted Problem-Based Learning model. The implementation of the news-assisted Problem-Based Learning model provides students with knowledge and skills in solving problems found in the news, which are addressed in groups. This aligns with the research by Susetyarini et al. (2022), which shows that group-based learning using the Problem-Based Learning model can enhance students' collaboration and communication skills. Additionally, in line with the research by Hartina et al. (2022), it is argued that the Problem-Based Learning model can enhance students' collaboration skills.

However, in the implementation of learning, there are still some students who are passive and unwilling to contribute to their group and only focus on completing the individual tasks that have been given. According to Mustikaati et al. (2025), each student has different habits and needs time to adjust to the group. Nevertheless, in each learning session using the Problem-Based Learning model, there is an improvement in collaborative skills. This aligns with Ilmiyatni's (2019) research, which states that over time, students demonstrate higher initiative and responsibility in completing tasks, both individually and in groups, to achieve common goals.

Based on the data obtained, all indicators showed an increase. The highest increase was obtained by the indicator of working productively, while the lowest increase was obtained by the indicator of working productively and showing flexibility. The implementation of the Problem-Based Learning model can enhance students' collaborative skills. This is evident from their active participation in group discussions, equitable task distribution, and supportive attitudes when addressing assigned problems. Students also appear to be able to make decisions together, show responsibility for the information collected, and be flexible towards ideas from other group members. This is in line with the statement by Aspridanel *et al.*, (2019), who state that the Problem-Based Learning model encourages the improvement of collaborative skills through active cooperation in problem solving.

Student Responses to the Problem Based Learning Assisted by News

Student responses to the application of the news-assisted problem-based learning model in ecosystem material are presented in Table 2. The data in Table 2 show that, overall, students responded positively to the news-assisted problem-based learning model in the ecosystem material that was applied.

Table 2 Student Responses to Problem Based Learning Assisted by News

No.	Indicator	Assessment Score (%)
1.	Interest	81
2.	Understanding	82
3.	Benefits	83
	Average response score	82
	Category	Very Good

The survey results show that the learning method used has made students more interested, better able to understand the material, and has had a significant impact. Students stated that the news-assisted problem-based learning model made them more enthusiastic about learning biology, as evidenced by the fact that they did not feel sleepy or stressed during the learning process. Students are interested in learning because the learning process is aligned with the learning objectives and suits the teaching style desired by students. This is in line with the research by Ahmad et al., (2020), which states that students feel happy because they

are able to apply the material provided in solving problems they face in their daily lives.

This learning model also enhances students' knowledge, facilitates their understanding of the material, and encourages them to learn more about problem-solving and finding solutions to the problems presented. Students also develop collaboration skills with their peers and become more active in the learning process. This is in line with the research by Hairina et al., (2021), which states that with the news-assisted Problem-Based Learning model, students gain experience in finding ideas and solutions in conducting investigations and can interact and discuss with their group members.

Students also have the skills to work together in groups and are more active in learning. This is in line with research conducted by Adriani et al., (2021), which states that students feel that learning with the news-assisted Problem-Based Learning model is beneficial because students have the opportunity to be active in discussions, exchange ideas with group members and teachers to solve a given problem.

CONCLUSION

Based on the results of the analysis and discussion, it was concluded that the news-assisted Problem Based Learning model applied to ecosystem material was effective in improving students' conceptual understanding and collaboration skills. This was demonstrated by a classical completion rate of 79%, a moderate N-Gain score, an increase in collaboration skills at each meeting, and excellent student responses to the news-assisted Problem Based Learning model.

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