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THE EFFECT OF DISCOVERY LEARNING MODEL ON SCIENCE LITERACY SKILLS OF ECOLOGICAL MATERIAL AT SMP NEGERI 1 DELITUA

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Abstract

This research aims to investigate the impact of the Discovery Learning model on students' scientific literacy skills in ecology at SMP Negeri 1 Delitua. The research method used was quantitative with a sample of 66 students from classes VII-5 and VII-6, selected using a purposive sampling technique. The instrument used is a scientific literacy test, with the independent variable (Discovery Learning model and direct learning model) and the dependent variable is students' scientific literacy abilities. The results of the research show that the application of the Discovery Learning model has a significant influence on the scientific literacy abilities of class VII-5 students who are at level 2 with a score of 31, which is in the poor category. However, after implementing the Discovery Learning model, scientific literacy ability increased to level 4 with a score of 69 and was included in the sufficient category.
In conclusion, the application of the Discovery Learning model is effective in improving students' literacy skills on ecological material in class VII-5 SMP Negeri 1 Delitua. This finding provides an important implication for the development of a more problem-oriented student learning approach in improving students' science literacy.

Keywords: Discovey Learning, Student Science Literacy

Introduction

In the twenty-first century, education has become increasingly crucial to ensure that students have the ability to learn and develop, use innovative media and data, and work and live with these skills. By designing education modules suitable for primary school (SD), junior high school (SMP), senior high school (SMA), and vocational high school (SMK) education, the Indonesian Department of Education and Culture has introduced three concepts of 21st century learning. These instructions serve as a minimum threshold. The 21st century requires an education that equips students with the skills necessary to succeed in the global economy. The 21st Century Skills Association concept emphasizes the importance of teaching students how to collaborate, communicate effectively, and make informed decisions in a dignified and inspiring manner (Pratiwi et al., 2019).

The concept of science education is closely related to everyday life. Through logistical strategies, science education programs help students understand the world around them. The purpose of science learning in junior high school is to help students understand themselves and their environment, and build strong academic understanding and concepts that can be applied in everyday life. To understand problems and knowledge concepts, one must be able to use the information they have to formulate questions, generate reliable information, provide logical explanations, and measure and analyze existing data. This concept is called logical proficiency (OECD, 2019).

Science literacy can be defined as a person's ability to acquire scientific knowledge, convey scientific information, and use logic to solve problems scientifically, which ultimately helps shape attitudes and awareness of the surrounding environment. The dominance of science and innovation in this modern era plays an important role in the progress of a country's education. As an educational field that has not been fully developed, science education has an important role in developing students who have basic, consistent, creative and global thinking skills. Science education is intended to be a primary method for students to gain a comprehensive understanding of science and to apply it in their daily lives. Consequently, scientific literacy is regarded as a fundamental necessity for every student (Irsan, 2021).

In 2018, Indonesian students' science literacy skills were still low, as seen from the lower score compared to the average OECD country, which is 487-489. According to the 2018 PISA (Program for International Student Assessment) results, Indonesia recorded an average science score of 396, placing Indonesia 70th out of 78 participating countries (OECD, 2019). In 2022, Indonesia's score dropped to 383 and its ranking rose slightly to 66 out of 80 countries. The low scientific literacy levels are also due to poor reading habits among students, who are often unwilling to spend time reading. To enhance scientific literacy, strong reading skills are essential. Questions related to everyday situations can help students address problems more effectively (Fuadina et.al., 2022).

Science learning in Indonesia tends to under-optimize students' science literacy skills. This is also reflected in science textbooks that do not optimize content that supports science literacy skills. As a result, Indonesian students' science literacy skills are underdeveloped. The lack of development of science literacy skills is thought to be a contributing factor to the difficulty of students mastering science concepts optimally (Simanjuntak et.al., 2023). Further efforts are needed to improve science learning so that science literacy in Indonesia can increase. Science literacy enables individuals to critically evaluate and design scientific research, as well as improve their overall understanding of science (Hardinata, et al., 2019).

Based on observations of classroom activities and interactions between students and teachers at SMP Negeri 1 Delitua in the 2023-2024 school year, it was found that although the teacher claimed to use the Discovery Learning model, in reality he rarely implemented it. Observations also showed that the teaching approach mostly used by teachers tended to be passive, with

the main focus on understanding the material, which caused students' understanding of the material to be hampered. In addition, there was no assessment of the culture of science among students, indicating a deficiency in the application of science literacy. To improve students' scientific understanding, it is recommended that teachers adopt learning methods that encourage students' active participation in the learning process. In this way, it is expected that students can more effectively develop their scientific understanding skills.

Discovery Learning is a teaching method that focuses on students uncovering information through inquiry and constructivism. This approach seeks to give students learning experiences that enable them to solve real-world problems on their own. As part of the constructivist approach, students are encouraged to use their own resources in solving emerging problems. The development of the Discovery Learning paradigm facilitates students' active participation in research and experimentation, which ultimately helps them understand the material studied more deeply (Hi Rahman et al., 2022).

Ecology materials are considered appropriate and relevant because they are directly related to students' daily lives. In addition, students are encouraged to express their opinions critically and creatively according to the ecology reading material, which helps improve their understanding of the topic (Mayarni & Yulianti, 2020). Therefore, ecological issues are considered very important as they are related to real scientific events and phenomena. Teachers are advised to create learning activities that encourage students' active participation in exploring their own concepts related to the issues at hand. The applied learning model can better attract students' interest and improve their critical thinking skills (Ariani & Ratnawulan, 2020).

An initial solution to address the challenges students face is to change the teaching model or method to better support individual growth potential. This approach encourages students to actively participate rather than just engage in passive learning. One of the best ways to achieve this is by implementing the Discovery learning model. This model emphasizes the importance of students taking responsibility for their education and actively learning concepts or principles that they have not known before (Ariana et al., 2020). Another study (Hajrah et al., 2021) also proved that the application of the Discovery Learning model can improve students' scientific understanding because natural science is not only a collection of facts, but also involves a process of research and discovery. Supported by research (Wahdatul & Syaiful, 2023), the use of a Discovery Learning learning model based on knowledge acquisition can improve students' independent learning abilities. Therefore, the use of Discovery Learning that focuses on learning outcomes can be a good option for educators to improve student understanding, especially in science classes. Science education emphasizes the importance of sensitivity training, including the ability to differentiate science-related problems.

Research Method

This research uses quantitative research methods based on positivist theory and is used to study populations or samples. Data collection is carried out using qualitative research instruments, and data analysis uses quantitative / statistical methods to test predetermined hypotheses (Sugiyono, 2019). The quantitative research conducted is a quasi-experiment using a Pretest and Posttest Control Group design. This study involved two classes: the experimental class, where students were taught using the Discovery Learning model, and the control class, which did not receive this intervention.

The sample selection process in this study used purposive sampling method, which determines the sample members involved according to the research objectives (Hardan et al., 2020). In order to select a research sample that would increase the level of student proficiency in the classroom, the researcher collaborated with the teacher. Based on the results of the study, the research sample consisted of 66

students, of which the majority were in class VII-5 which was designated as the experimental group that applied the Discovery Learning learning model, and class VII-6 which was designated as the control group, which made it possible to compare the effectiveness of these learning models.

This study used a Pretest and Posttest Control Group Design. Samples were given identical pretests and posttests. The pretest is given before treatment to get a strong basis for assessing change. The posttest was conducted after the treatment to evaluate the impact of the treatment that had been given to learners and see changes in the final results.

In validating the instrument, the validity test, reliability test, question differentiator test and item difficulty test were carried out. To test the validity of the instrument, it is first validated by an expert. After validation, the questions are then tested on a non-sample group.

The assessment of the validity of the topic was carried out using the Point Biserial Correlation Coefficient, with the help of Statistical Program for Social Science (SPSS) version 22 software. Items of assessment instruments are considered reliable if the results remain consistent when used for measurement at different times, in accordance with the concept described by (Supardi, 2016). Differentiating power of assessment instrument items, is the ability of the question to distinguish between students with high abilities (upper group) and students with low abilities (lower group) (Supardi, 2016). A measure that shows the level of difficulty or ease of a question is referred to as its level of primacy. The ideal assessment instrument is one that has a moderate level of difficulty, meaning that it is neither too difficult nor too easy. To calculate the difficulty index, a formula is used that can provide an overview of how well the question is in measuring student understanding or skills (Rahman and Nasryah., 2019).

Data analysis techniques are descriptive statistical results analysis, prerequisite tests, hypothesis testing, gain normality test, and analysis of science literacy skills. The prerequisite tests conducted in this study included the normality test and homogeneity test. The normality test is used to determine if the population distribution follows a normal distribution pattern or not. Normality tests are usually conducted using methods such as the Shapiro-Wilk test on Statistical software, such as Statistical Program for Social Science (SPSS) version 22, with a significance level that is generally set at 5% or 0.05. In this context, if the significance value (p-value) of the normality test is greater than the set significance value (α), for example 0.05, then the data will be normally distributed. The homogeneity test is used to determine whether or not several groups of research data have the same variance. One commonly used method is the Levene test, which is usually performed using statistical software such as SPSS, with a significance level of $\alpha = 0.05$. If the Levene statistical value is greater than 0.05, then the data variance is considered homogeneous, while if the Levene statistical value is less than 0.05, then the data variance is considered inhomogeneous. To determine whether Ha is accepted or rejected, hypothesis testing is used. Hypothesis testing of pretest and posttest of students' science literacy skills using Independent Sample T-Test on SPSS version 22. While Ha is rejected and Ho is accepted if the significance value is more than 0.05, while Ha is accepted and Ho is rejected if the significance value is less than 0.05.

Result and Discussion

In this section, the results of the research conducted at SMP Negeri 1 Delitua with Ecology material in class VII in the 2022/2023 academic year will be presented. The two classes used as samples in this study were class VII-5 which acted as an experimental group and applied the Discovery Learning learning model, and class VII-6 which used the direct learning model and acted as a control group. The research began by giving a pretest to the sample class then after obtaining the pretest results from the two classes given different treatments, then given a posttest to measure the improvement of students' science literacy skills.

1. Science Literacy Skills

Data on science literacy skills were collected by giving pretest and posttest to experimental class taught with Discovery Learning model and control class taught with direct learning model. The purpose of giving the pretest is to determine the growth of students' abilities after learning to apply the discovery learning model. Figure 1 shows the comparison of science literacy skills of experimental and control classes based on pretest data and posttest data.

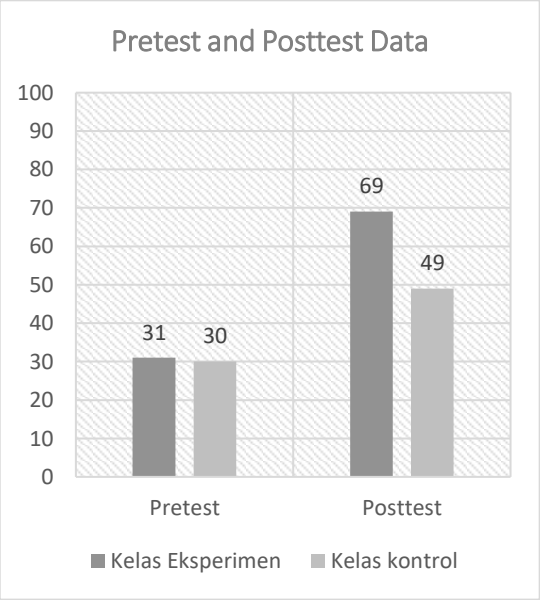

Figure 1. Comparison diagram of Pretest and Posttest data

According to the figure presented, the average posttest score of the experimental class (69) is significantly higher than that of the control class (49), with a difference of 20 points. In addition, the data shows an increase in the average value from pretest to posttest in both classes. Thus, overall, it can be concluded that the experimental class experienced a more significant increase in science literacy skills compared to the control class. This finding provides a strong indication that the learning model applied in the experimental class was effective in improving students' science literacy skills.

In the experimental class, the application of the Discovery Learning model begins by providing a stimulus for students to identify problems and conduct investigations to find solutions. This process encourages students to analyze and connect science concepts in a real-life context to solve the problem at hand, with guidance from the teacher. During this exploration, various factors influence students' science literacy skills. Students are encouraged to think critically during discussions, be active in finding solutions, and dig up information from various literature sources to broaden their understanding. This approach not only helps students in solving problems, however, it also encourages them to apply science principles in everyday life, resulting in more complex and nuanced learning outcomes.

2. The Effect of Discovery Learning Model on Science Literacy Skills

a. Normality test for posttest data

Table 1. Normality Test on SPSS

Tests of Normality

		Shapiro-Wilk		
	Model	Statistic	df	Sig.
Science Literacy Skills	Eksperimental Pretest (DL)	.943	33	.082
	Eksperimental posttest (DL)	.938	33	.061
	Pretest Control (Direct Instruction)	.943	33	.086
	Posttest Control (Direct Instruction)	.962	33	.286

a. Lilliefors Significance Correction

The normality test results showed that the significance values for science literacy skills in the experimental class pretest and posttest, as well as the control class pretest and posttest, were 0.082, 0.061, 0.086, and 0.286, respectively. All significance values exceed the predetermined alpha value of 0.05, indicating that the pretest and posttest data for both the experimental class using the Discovery Learning model and the control

class do not significantly deviate from a normal distribution. Therefore, it can be concluded that the pretest and posttest data from both classes meet the assumption of normality, ensuring reliability for further statistical analysis. The success of this normality testing provides a solid foundation for the study and ensures that data analysis can be conducted appropriately according to the statistical methods used. The pretest and posttest data of both experimental and control classes came from normally distributed samples. This is in accordance with the results of the normality test using SPSS.

b. Homogeneity Test Result of Science Literacy Ability Score

Test of Homogeneity of Variance

		Levene Statistic	df	df2	Sig.
Science Literacy Skills	**Based on Mean**	**.935**	**1**	**64**	**.337**
	Based on Median	**.922**	**1**	**64**	**.341**
	Based on Median and with adjusted df	**.922**	**1**	**63.223**	**.341**
	Based on trimmed mean	**.830**	**1**	**64**	**.366**

Tabel 2. Pretest Data Homogeneity Test

Test of Homogeneity of Variance

		Levene Statistic	df	df2	Sig.
Kemampuan Literasi Sains	**Based on Mean**	**.003**	**1**	**64**	**.957**
	Based on Median	**.023**	**1**	**64**	**.881**
	Based on Median and with adjusted df	**.023**	**1**	**63.985**	**.881**
	Based on trimmed mean	**.000**	**1**	**64**	**.990**

Based on the results of homogeneity testing, the significance value for science literacy in the experimental class pretest is 0.366 and in the control class is 0.990. Both significance values (0.366 and 0.990) are greater than the set alpha value (0.05), this indicates that the experimental and control group pretest data have good homogeneity. After the homogeneity test, it can be concluded that the data on science literacy skills of the experimental and control groups come from uniform samples. Based on the homogeneity test using SPSS, it is found if the data is homogeneous. Data that has been normally distributed and homogeneous will then be used for hypothesis testing.

c. Science Literacy Hypothesis Test Results

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means				
						95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	10.028	64	.000	19.152	1.910	15.336	22.967
Equal variances not assumed	10.028	63.905	.000	19.152	1.910	15.336	22.967

Table 5. Hypothesis Test of Posttest Data

The results of hypothesis testing show a significance value (2-tailed) of 0.000. Since the significance value is less than the alpha level of 0.05, it can be concluded that there is a significant difference between the groups using the Discovery Learning model and those using the direct learning model regarding students' science literacy skills in Ecology material in class VII at SMP Negeri 1 Delitua. Thus it can be concluded that H0 (null hypothesis) is rejected and Ha (alternative hypothesis) is accepted. Therefore, It can be concluded that the Discovery Learning model significantly enhances students' reading comprehension skills in science subjects for class VII at SMP Negeri 1 Delitua.

d. Gain Normality

N-Gain was used in this study to assess the learning outcomes of students who participated before, during, and after learning.

Class	Pretest	Posttest	N-Gain	Criteria
VII IPA (Eksperiment)	31	69	55%	Enough
VII IPA (Control)	30	49	27%	Very low

Table 6. N-Gain Test Results

Based on the completed N-Gain analysis, there is a significant difference between the experimental and control groups. The experimental group, which used the Discovery Learning model, had an N-Gain of approximately 55%, categorized as sufficient. In contrast, the control group had an N-Gain of only around 27%, categorized as very low. This indicates that the improvement in science literacy in the experimental class was much greater compared to the control class, which did not receive the treatment. Thus, the N-Gain results confirm that the application of the Discovery Learning learning model effectively improves students' science literacy skills in understanding and applying scientific concepts related to Ecology Material.

e. Analysis of Science Literacy Skills

Analysis of students' science literacy skills was conducted to determine their proficiency in terms of both the experience and control groups. In addition, to assess how the Discovery Learning paradigm affects students' understanding of reading comprehension. Based on the results of the
The data of students' reading comprehension skill level is determined by the pretest and posttest scores. Data on the level of students' science literacy skills can be seen in tables 7 and 8.

Class	Pretest	Level	Criteria
VII IPA (Eksperimen)	31	2	Low
VII IPA (Kontrol)	30	2	Low

Table 7. Results of students' science literacy skills based on pretest scores

Class	Posttest	Level	Criteria
VII IPA (Eksperiment)	69	4	Enough
VII IPA (Control)	49	3	Less

Table 8. Results of Analysis of Students' Science Literacy Skills based on posttest scores

Based on Table 7, the average pretest score of the experimental class is 31 which is classified as low and is at level 2, while the average pretest score of the control class is 30 which is at level 2 and is in the low category. After being given the opportunity to practice using the Discovery Learning learning model during the experiment, the average posttest score obtained was 69, which was included in the sufficient category with level 4, as shown in Table 8 in the control group, the average posttest result was 49 which was at level 3 and classified as poor. The comparison of the acquisition of science literacy scores between the experimental and control classes can be seen in Figure 2. Based on this comparison, it can be seen that the increase in reading comprehension skills of the experimental group after using the Discovery Learning learning model is more significant than the control group using the direct learning model.

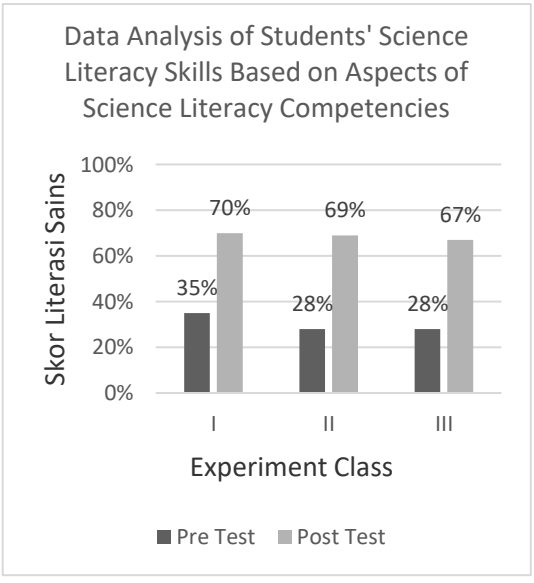

Figure 2: Comparison of experimental and control class science literacy scores

Based on the figure, it can be seen that the experimental class has increased in each area of competence. In terms of competence,

it can be seen that students who successfully completed the pretest had higher scores than students who did not successfully complete the pretest, which increased from 35% to 70% in the posttest. Furthermore, in the competency area of evaluating and designing scientific investigations, there was a significant and more striking increase compared to the other two competency aspects, namely from 28% in the pretest to 69% in the posttest. In addition, in the aspect of competence in scientifically interpreting data and evidence, there was also a significant increase, with a value that was no less high than the previous aspect, namely from 28% in the pretest to 67% in the posttest.

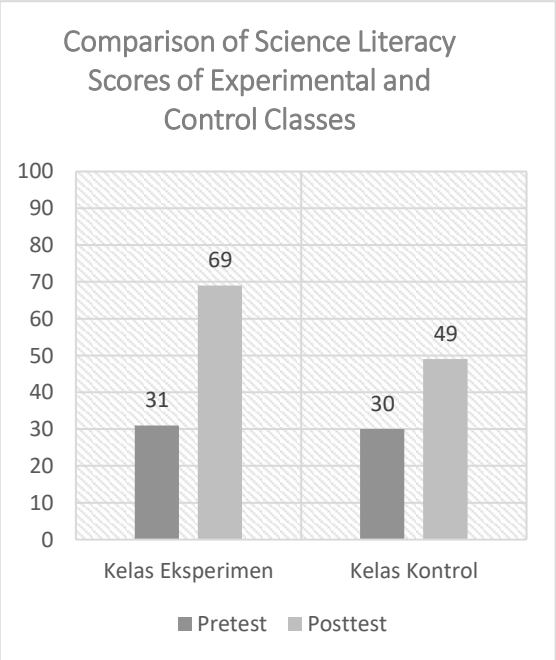

Figure 3. Analysis of Science Literacy Ability on Competency Aspects

I. Competency Explain Phenomena Scientifically

II. Competency in Evaluating and Designing Scientific Inquiry

III. Competency Interpreting Data and Evidence Scientifically

The analysis of science literacy skills revealed a significant increase, particularly in the experimental class that used the Discovery Learning model. Conversely, the control class that employed the direct learning model showed only minimal improvement. This finding underscores the impact of the Discovery Learning model in enhancing students' science literacy skills compared to the direct learning approach. Thus, the implication is the need for serious consideration of the application of learning models that are more oriented towards student experience and discovery in the context of developing science literacy that is more effective even though it is still in the deficient category. The analysis of the average pretest and posttest scores reveals that the Discovery Learning teaching methodology positively affects students' critical reading skills, particularly regarding environmental texts, in class VII at SMP Negeri 1 Delitua. This shows that a learner-focused educational approach is interactive, when compared to more traditional learning models, problem-based learning models can be more effective in improving students' understanding and application of scientific concepts.

In conclusion, the intervention conducted during the experiment, especially by applying the Discovery Learning model, had a positive impact that led to significant changes in students' science literacy skills, especially in their understanding. This is evident from the improvement in students' ability to explain phenomena scientifically, evaluate and design research scientifically, and interpret data and evidence scientifically.

3. The Effect of Discovery Learning Model on Science Literacy Skills

Students' science literacy skills were measured using posttest scores after using the Discovery Learning model in the experimental class and without using the model in the control class. The low pretest results in both classes were caused by students' inability to understand the material to be studied in class and lack of interest in studying science literature. After both classes learned the material, they were given a posttest to measure their progress in improving reading comprehension. The results are shown in Table 6, where the experimental class showed a higher improvement in reading comprehension compared to the control class.

The results of this study show that the use of the Discovery Learning approach significantly improves students' reading comprehension, especially in understanding ecological concepts and problem solving skills, and critical thinking skills. Data analysis indicated a significant improvement in these aspects following instruction with the Discovery Learning model. The class using the Discovery Learning model demonstrated a greater enhancement in science literacy skills compared to the control class, which employed the direct learning model.

Implementing the Discovery Learning model in education positively influences students' science literacy skills. This happens because learners are encouraged to be active in solving problems presented in the learning context. The problems presented encourage learners' curiosity to engage in active discussions to identify problems and find solutions. This theory is supported by the view of (Laila & Firaina, 2020) which describes the Discovery Learning model as a learning approach in which students not only receive knowledge, but are also directed to be active in finding their own information through observation and discussion, creating a more meaningful learning experience.

Applying the Discovery Learning model in science education is seen as a suitable approach to meet the demands of the 21st century. Science literacy, in this context, refers to the ability to use science knowledge to identify new information, explain scientific phenomena, and make inferences about issues related to science. With this kind of science literature, students can engage in topics related to science, thus increasing their awareness of related scientific issues, and developing skills to face today's challenges. This opinion is in line with the views expressed by (Ahfiani & Arif, 2023), One thing to note is the importance of incorporating science literacy methods into teaching with the Discovery Learning approach. Science literacy not only emphasizes theory, but also focuses on the process and development of scientific attitudes, as well as strengthening critical thinking skills in students. (Hajrah et al., 2021) It is also noted that the Discovery Learning model is one of the approaches that can enhance students' scientific literacy. This model presents a new approach to learning by combining elements of art and directed achievement. In this way, it creates diverse learning experiences, considers every relationship, interaction, and variation, and takes advantage of learning moments that emphasize the dynamics of relationships in the classroom environment. Employing the appropriate learning model is anticipated to enhance students' science literacy related to the material being taught. With a strong understanding of the material, students will be better able to solve various types of problems well, thus achieving the expected level of science literacy.

Analysis of Table 7 and Table 8 reveals that the implementation of the Discovery Learning model in ecology instruction in the experimental class has significantly positively impacted students' science literacy skills. Through this learning model, students are actively involved in discussions to identify real-world problems and conduct critical thinking, collaboration and in-depth analysis to solve these problems. By actively participating in the learning process, students can gain a deeper understanding of ecological concepts and improve their skills in interpreting information scientifically.

Figure 3 indicates a significant increase from pretest to posttest results in the competency aspect of explaining phenomena scientifically. In the pretest, only 35% of students managed to give the right answer, but this figure increased to 70% in the posttest. This shows that the Discovery Learning model effectively helps students in developing their ability to provide scientific and critical explanations of observed phenomena.

This finding is in line with previous research conducted by (Idhayana et al., 2023), which asserts that the Discovery Learning Model encourages students to discover concepts on their own through a series of activities. This model has a suitable structure for use in classroom action research, which can improve students' science literacy through the process of problem identification, data search, data

analysis, and conclusion making. Discovery Learning also encourages students to actively read and discuss in groups to solve the problems faced. This opinion is also in line with the views of (Setia, 2023), who noted that Discovery Learning encourages learners to discover new knowledge through exploration, investigation, experimentation, and a series of other challenging activities. It is ideal for teaching natural science because it gives students direct experience and makes learning more meaningful.

The overall findings suggest that the Discovery Learning model not only helps students in understanding difficult material, but also significantly improves their ability to explain phenomena scientifically. This learning process encourages students' active participation in group discussions to convey ideas and solutions that support their ability to face real-world problems and solve them effectively. Furthermore, in the aspect of competence in evaluating and designing scientific investigations, there was a significant improvement. From the pretest results, only 36% of students answered correctly, but this figure increased to 66% in the posttest. This increase shows that the Discovery Learning model not only strengthens students' ability to evaluate correctly, but also in designing scientific investigations that are more systematic and efficient. This model also trains students in critically analyzing information, identifying weaknesses, and evaluating the credibility of sources in scientific investigations.

This finding is consistent with previous research, as presented by (Sari et al., 2022) which states that Discovery Learning encourages students to use intuition, imagination, and creativity in drawing conclusions through the process of observation, search, questioning, experimentation, association, and communication. This model can also increase students' interest in reading and provide opportunities for them to improve their science literacy skills in everyday life through the stages of the Discovery Learning learning process.

Several factors contribute to the enhancement of students' science literacy, including the application of the Discovery Learning model in instruction. This model encourages students to discover concepts on their own with guidance, allowing them to learn from various sources such as books, in addition to the teacher. In addition, scientific phenomena, including scientific issues, scientific journals and investigations to prove concepts, provide a variety of relevant reading materials. For example, in learning about global warming, students are given exercises to read diverse science or science articles, which helps improve their science literacy skills (Yaumi, 2017).

Finally, a significant increase was seen in the posttest results related to the ability to interpret data and evidence scientifically. From 28% in the pretest, The figure increased to 69% in the posttest, demonstrating that the Discovery Learning model helps students effectively use scientific data and evidence to support their arguments. In the Discovery Learning process, students develop these skills through information gathering, critical analysis, and data synthesis to formulate solutions to the problems at hand. This finding is in line with previous research, as presented by (Ghifari et al., 2023), which states that knowledge gained through Discovery Learning can last long and has a better transfer effect. Therefore, Discovery Learning not only enhances reasoning and free thinking but also develops students' cognitive skills in finding and solving problems.

This is in line with the statement from (Sains et al., 2022) Discovery Learning is a teaching model frequently used to foster active learning skills in students. This model emphasizes student engagement in the learning process, where they actively participate in understanding and exploring concepts. In addition, learners are also given the opportunity to practice analytical thinking skills and try to solve problems that are relevant to everyday life.

The data provides consistent and significant evidence of the benefits of implementing the Discovery Learning model in improving students' science literacy skills. At the level of understanding scientific phenomena, the model produced satisfactory results by improving students' ability to

explain phenomena scientifically. In addition, students' ability to evaluate and design scientific research also improved significantly, suggesting that Discovery Learning provides a strong platform for the development of analytical and methodological skills in a scientific context. Overall, this study demonstrates that the Discovery Learning teaching model significantly enhances students' ability to interpret data and evidence scientifically, which is a crucial competency in science literacy.

The implementation of the Discovery Learning model has consistently shown improvements in key aspects of students' science literacy. One of the biggest advantages is in students' ability to explain phenomena scientifically, which is the basis of a strong understanding of scientific concepts. Furthermore, the model assists students in developing evaluative and scientific research design skills, which are essential in forming a critical and independent scientific mindset. Thus, Discovery Learning not only improves students' ability to understand and explain scientific concepts, but also equips them with the necessary skills to think scientifically and solve problems with a systematic and scientifically informed approach.

4. Factors that influence the effect of the application of the Discovery Learning model on students' science literacy skills in science learning.

Although the Discovery Learning model has enhanced students' science literacy, the improvement is still limited to the sufficient category level and goes to level 4. One factor that plays a role is the lack of habit of using the learning model. Students who are used to the direct learning method may have difficulty adapting to the Discovery Learning approach which requires them to be active in learning activities. The direct learning model tends to make the teacher the main source of information, while in Discovery Learning, students must play an active role in finding problems and finding information related to the problems found. Direct learning activities can be an obstacle in adopting this new approach because the roles of teachers and students change. Therefore, additional time and effort is needed to help students adapt to the discovery learning model and develop the skills needed.

Conclusion

The research conclusion indicates that applying the Discovery Learning model significantly improves science literacy skills related to ecological material in class VII-5 at SMP Negeri 1 Delitua. This suggests that following the implementation of the Discovery Learning model, there is a significant increase in students' ability to understand and apply science concepts related to ecology. There is a noticeable improvement in the science literacy skills of students in class VII-5, such as reading and writing abilities, which initially were at level 2 with a score of 31 in the Low category. But after applying the Discovery Learning paradigm, the ability increased to level 4 with a score of 69 so that it is in the good enough category.

The increase in scientific literacy skills occurred in all aspects of competence where the most significant increase was in the part of explaining scientific phenomena where when doing the pretest only got a score of 35% but when doing the posttest it increased to 70%, the same thing also happened in the part of evaluating and designing scientific research where when doing the pretest only got a score of 28% and when doing the posttest it increased to 69%. Then the increase also occurred in the part of interpreting data and evidence scientifically. This can be seen in the pretest scores of students who initially got 28% increased to 67%. This proves that the effect of the discovery learning model has a positive impact on students' ability in science literacy.

Based on the results and conclusions above, the researcher recommends several suggestions, among others:

1. Teachers or prospective teachers are expected to apply the Discovery Learning model in teaching Science. This step can help improve students' understanding and

skills in understanding science concepts more deeply.

2. Students or researchers are also expected to conduct further research on the Discovery Learning learning model, not only limited to ecological materials, but also on other science materials. This research can provide greater insight into the effectiveness of these learning models in different contexts.

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