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Analysis of Science Probelm Solving Abilty Reviewed from Student Curiosity and their Learning with E-Module Assisted PjBL Model Respiratory Matter

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Abstrak

Tujuan penelitian ini adalah untuk meningkatkan curiosity siswa dan kemampuan pemecahan masalah IPA kelas V pada materi pernapasan melalui model project based learning berbasis e-modul. Teknik pengumpulan data menggunakan wawancara tidak terstruktur, angket, tes, dan dokumentasi. Teknik analisis data dianalisis menggunakan analisis kuantitatif, yaitu uji t satu variabel, uji beda, uji N-Gain, dan uji regresi, dan selanjutnya menggunakan analisis kualitatif. Hasil penelitian: (1) Kemampuan pemecahan masalah IPA siswa lebih dari nilai KKM yaitu 75 dengan hasil nilai t_{hitung} = 2,741 (>1,706) dan nilai signifikansi 0,015 (<0,05); (2) Terdapat peningkatan kemampuan pemecahan masalah IPA sebesar 44,27% setelah pembelajaran dengan model PjBL/*project Based Learning* berbantuan *e-modul* ; (3) Ada pengaruh curiosity terhadap kemampuan pemecahan masalah IPA siswa sebesar 84,7% sehingga dapat disimpulkan bahwa semakin besar curiosity siswa maka semakin tinggi kemampuan pemecahan masalah

Kata Kunci: Kemampuan Pemecahan Masalah IPA, Curiosity, PJBl, dan e-modul

Abstract

The purpose of this study was to improve students' curiosity and problem-solving skills in science in grade V on respiratory material through a project-based learning model based on e-modules. Data collection techniques used unstructured interviews, questionnaires, tests, and documentation. Data analysis techniques were analyzed using quantitative analysis, namely one-variable t-test, difference test, N-Gain test, and regression test, and then using qualitative analysis. The results of the study: (1) Students' science problem-solving skills are more than the KKM value of 75 with a t-count value of 2.741 (> 1.706) and a significance value of 0.015 (<0.05); (2) There is an increase in science problem-solving skills of 44.27% after learning with the PjBL/project Based Learning model assisted by e-modules; (3) There is an influence of curiosity on science students' problem-solving skills of 84.7% so that it can be concluded that the greater the student's curiosity, the higher the problem-solving skills.

***Keywords**: Science Problem Solving Skills, Curiosity, PJBl, and e-modules.*

Introduction

The demands of science learning are to prepare students to have high-level thinking skills, ultimately giving rise to the ability to think critically, creatively, innovatively, and solve problems as human resources.(Pistanty et al., 2015). Students with a high sense of curiosity are able to gain more knowledge from the material studied than students who only rely on the teacher's explanations in delivering learning material. Curiosity is one of the factors driving student motivation in learning, thus influencing decision making.

The low ability to solve science problems also occurs in the Legokkalong 03 State Elementary School environment, Karanganyar District, Pekalongan Regency. This can be seen in the science learning material on Respiratory Class V. Problem solving ability is a student's skill in using the news or stories obtained to determine what should be done in a particular condition.(Oktaviani & Tari, 2018). Problem solving skills are very important for students to master, especially in the 21st century. So problem solving skills are fundamental. However, in reality, many students face obstacles. As can be seen from the evaluation results, 80% of students have not been able to solve questions related to science problem solving abilities, interest and motivation to learn are still low, and curiosity is low.

A teacher's policy in choosing learning models and the use of learning media has a big influence on student success, namely making students enthusiastic and motivated to learn so that students will not get bored or fed up when learning.

From these problems there are two learning problems, namely; 1) Lack of student curiosity because students are less active in asking questions and only listen monotonously to the teacher's explanations. 2) Lack of student interest during learning will influence the low level of students' science problem solving abilities. So learning models and media are needed that are able to attract students' interest, enthusiasm and curiosity so that they can change the learning climate from previously teacher-centered to student-centered. To answer this problem, researchers offer a solution by using the Project Based Learning learning model assisted by E-Modules in Natural Sciences subjects. This is because the project based learning model is a way of learning that positions students to be able to build their own knowledge by applying the latest experience they have gained with various illustrations or examples.(Safriana et al., 2022). So, by using the Project Based Learning model, students are expected to be able to explore their own knowledge and combine the new information they obtain through the projects they undertake. In this case the students become active while the teacher acts as a facilitator, director and then supervises the students' work in producing the project.

To attract students' interest in learning, the Project Based Learning model can be combined with E-Module media, this is because E-Module media isare teaching materials in the form of modules combined with electronic interactive media format with the aim of increasing students' enthusiasm, motivation and interest in learning(Siregar & Harahap, 2020). In this case, e-modules can be interpreted as learning media in the form of teaching materials which contain images, videos, audio and animations which can increase students' enthusiasm, interest and motivation in learning, so that students do not get bored and focus more on the material they are studying.

Method

This researchusing a mix method design type "The Explanatory Sequential Design". With two research stages, starting with quantitative research and continuing with qualitative research. The priority of collecting and analyzing qualitative data is carried out at an early stage. Building on the results of the analysis in the first stage, the researcher continues to the next stage with quantitative methods to test or generalize based on initial findings. The researcher then interprets how the qualitative research results are built on the initial findings (quantitative data).Main weight on strategyThis is found in quantitative data.

The experimental design used in this research is*Quasi Experimental Design*. The sampling technique is Cluster Random Sampling. The selection of samples from 2 classes was intended to simplify the research process because it was carried out in 1 group, namely the Among Siswo group. As a sample there are two classes which include:SDN 03 Legokkalong as the experimental class and SDN 02 Pododadi as the control class.

Data was collected through interviews and documentation. To verify the accuracy of the data in this research, data triangulation was used.Instruments are used to measure the variables studied,writing ability tests, questionnaires and study tools. AnalysisQualitative data in this study was used to describe science problem solving abilities in terms of students' curiosity in science learning based on high, medium and low groups. Qualitative data analysis was carried out using four steps, namely validity testing

data, data reduction, data presentation, and drawing conclusions.

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Results and Discussion

- **Research result**

1. Description of Research Data

1) Quantitative Research

In the first stage, collect and analyze quantitative data, to answer the formulation of the research problem"Can learning using the E-Module based Project Based Learning (PjBL) model be able to achieve quality learning?".

Quantitative Research was carried out in the 2023/2024 academic year semester 1 (July - October 2023).

Table 1. Quantitative Research Implementation Schedule

Class/ Implementation	Experiment	Control
Lesson Plan 1	07/25/2023	07/26/2023
Lesson Plan 2	08/08/2023	09/08/2023
Lesson Plan 3	05/09/2023	06/09/2023
Lesson Plan 4	10/19/2023	10/20/2023
Lesson Plan 5	03/07/2023	04/07/2023

2) Qualitative Research

Qualitative research was carried out in the 2023/2024 academic year, semester 2 (February - April 2024). The process of implementing qualitative research was carried out in the stages of giving an independence questionnaire, giving initial prose writing ability questions and interviews.

2. Analysis Prerequisite Test

1) Normality Test

Based on the normality test with the Shapiro-Wilk test, the score for the experimental class pretest was 0.109, the experimental class posttest was 0.064, the control class pretest was 0.056, and the control class posttest was 0.128. It is clear that the value . So it is accepted, so that the pretest and posttest data from the experimental class and control class are normally distributed.$sigsig > \alpha = 0{,}05 H_0$

2) Homogeneity Test

Based on the homogeneity test, the Sig value was obtained. 0.945. It is clear that the values thus received from the experimental and control class posttest data have the same variance (homogeneous)$sig > \alpha = 0{,}05 H_0$

3. Final Analysis

1) Descriptive statistics

Based on the statistical measurement table for descriptive analysis, it is known that the average score of 30 students in the control class is 68.00 while the average of 30 students in the experimental class is 78.97. At first glance it can be assumed that the average score for achieving science problem solving abilities for control class and experimental class students is much different. To strengthen this assumption, it is necessary to test the hypothesis

2) Inferential statistics

This research used a one sample t-test (Hypothesis 1), paired sample t-test and N-Gain test (Hypothesis 2), and Linearity Test, normality test and simple linear regression test (Hypothesis 3).

a. Hypothesis 1

Table 2. Determining the Average Value of Natural Science Problem Solving Ability

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Results of Science Problem Solving Ability	30	81.33	12.86	2,348

Table 3. Determining Significant Values

One-Sample Test

	Test Value = 70					
					95% Confidence Interval of the Difference	
	T	Df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Hasil Kemampuan Pemecahan Masalah IPA	2.741	25	.015	4.643	1.33	10.36

Based on calculations using the proportion test with a real level of 5%, SPSS calculations obtained a Sig value. (2-tailed) = 0.015 < 0.05.$t_{hitung} \geq t_{tabel} \leftrightarrow 2{,}741 > 1{,}706$Sorejected, meaning that the average science problem-solving ability for learning the Project Based Learning (PjBL) model assisted by e-modules on respiratory material exceeds the KKM. This is reinforced based on the results of the test data of 27 students out of 30 students who completed the test, meaning that the percentage of the experimental class was around 90% who completed the KKM.H_0

b. Hypothesis 2

Based on the results of the control class prostest t-test, the Sig. (2-tailed) = 0.962 0.05, so there is no difference in the results of the science problem solving abilities of students in the control class with respiratory material during the posttest, while the results of the science problem solving abilities of students in the experimental class with respiratory material during the posttest in the Experimental class Sig. (2-tailed) = 0.79 < 0.05, so there is a difference in the results of the science problem solving abilities of students in the respiratory control class during the posttest. So there is an increase in science problem solving abilities after learning.>

The calculation of the normalized Gain score in this study is as follows:

$$= \frac{Skor\ Postest\ Eksperimen\ - Skor\ Posttest\ Kontrol}{Skor\ Maks - Skor\ Postest\ Kontrol} \times 100 = \frac{81{,}33 - 66{,}5}{100 - 66{,}5} \times 100 = \frac{14{,}83}{33{,}5} \times 100 = 44{,}27$$

Based onFrom the calculation results, a gain score was obtained, namely 44.27. This score shows that 30 ≤ N-Gain ≤ 70. So it can be concluded that there is an increasescience problem solving ability learning PjBL model using e-module respiratory materialof 44.27 or a moderate increase.

c. Hypothesis 3

Table 4
Simple Linear Regression Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4061.440	1	4061.440	154,674	,000b
	Residual	735,226	28	26,258		
	Total	4796.667	29			

a. Dependent Variable: science problem solving ability

b. Predictors: (Constant), curiosity

In the Anova output results, the value Sig = 0.00 <0.05 is obtained, so H0 is rejected. So, it can be concluded that there is a significant influence between curiosity on the ability to solve science problems in Respiratory material with the PjBL learning model assisted by e-modules.. After that, the regression coefficient test was carried out with the following hypothesis formulation:

$H0$: $\beta = 0$ (regression coefficient is not significant).

H_1:$\beta \neq 0$ (significant regression coefficient).

The test criteria used are if the significance value is > 0.05 thenH_0accepted.

Table 5 Coefficients of Simple Linear Regression Test

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Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.
1	(Constant)	24.864	4.636		5.363	.000
	Curiosity	1.629	.131	.920	12.437	.000

Dependent Variable: kemampuan pemecahan masalah IPA

Sig value. (constant) = 0.000 < 0.05 and Sig. (curiosity) = 0.000 < 0.05, soH_0rejected. So, the regression coefficient is significant. Because the assumptions about the linearity of the model and the significance of the regression coefficients are met, the linear regression equation obtained can be used.

From the Coefficients output results, it can be seen that the Constant value (∝) is 24,864 and the coefficient valueβ(Curiosity) of 1.629. The following is the form of a simple linear regression equation for these two variables:

$$Y = \alpha + \beta X = 24{,}864 + 1.629$$

Table 6. Model Summary of Simple Linear Regression Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.920a	.847	.841	5.124

a. Predictors: (Constant), curiosity

It is known that the correlation/relationship value (R) is 0.920, which indicates a strong and positive relationship between the two. From this output, a coefficient of determination (R square) value of 0.847 was obtained. Which means that the influence of the curiosity variable and the science problem-solving ability variable on students' breathing material for 84.7% of students is caused by other factors.

4. Qualitative Analysis

This pretest research was conducted at SDN 03 Legokkalong with a total of 30 students as subjects. The science problem solving ability pretest and questionnaire were carried out before using the E-module assisted PJBL learning model, which is used to measure students' abilities before receiving treatment. Then, scores were obtained for science problem solving abilities which were grouped into low, medium and high categories. The following data was obtained:

Table 6.
PreTest Ability Value for Science Problem Solving Ability

Mark	Range	Qty	Percentage	Student Code
1	46-60	10	33%	S1, S2, S5, S7, S11, S15, S24, S25, S26.
2	61-75	17	56%	S3, S4, S6, S8, S9, S10, S12, S13, S16, S17, S18, S19, S20, S21, S22, S23, 28, S29, S30
3	76-90	3	10%	S14, S23, S27

Based on the pretest results of science problem solving abilities, it can be seen that science problem solving abilities are very diverse. Namely, of the 30 students at SDN 03 Legokkalong who received the High ability category, 3 children obtained a score of 10%, with a score range of 46-60 obtained by students with serial numbers 14, 23, and 27. For medium level ability, the score range was 61- 75 was obtained by 17 students with a percentage of 56%, namely students with serial numbers; 3, 4, 6, 8, 9, 10, 12, 13, 16, 17, 18, 19, 20, 21, 22, 28, 29, and 30. For the low category, there were 10 children with a percentage of 33% with a range grades 76-90, obtained by students with serial numbers 1, 2, 5, 7, 11, 15, 24, 25, and 26.

Based on this table and the criteria that have been determined, the researcher determined the research subjects based on the results of their ability to write prose in paraphrasing material, namely 2 students with the highest scores, 2 students with average scores, and 2 students with the highest scores.

The results of the work of the six selected research subjects were used to represent each level for deeper analysis with interviews regarding the ability to write prose paraphrased material. The research subjects used were S-14, S-27, S-17, S-28, S-7, and S-11.

5. Analysis of the Results of Natural Science Problem Solving Ability

Table 7.
TablePretest and Posttest Results of Research Subjects

No	Research Subjects	KMP Pretest	KMP posttest	nformation
1.	S-14	80	95	Increase
2.	S-27	80	90	Increase
3.	S-17	70	80	Increase
4.	S-28	65	80	Increase
5.	S-11	50	70	Increase
6	S-21	55	75	Increase

Based on Table 4.2 above, the research subjects in the lower group, average group and upper group experienced an increase in their ability to solve problems regarding respiratory organ materials with varying degrees of increase. In the lower group, namely S-14 and S-27, there was a significant increase of 12%. In the average group, namely S-17 and S-28, there was an increase of 20%. The increase in the upper groups, namely S-11 and 21, was 12%.

Analysis of indicators of natural science problem solving abilities regarding respiratory organs was carried out based on the results of work on test questions and the results of interviews with determined research subjects. The researcher took 2 questions resulting from the work of the research subjects with problem solving ability steps using 5 indicators, namely: (1) identifying problems, (2) looking for solutions, (3) making problem solving plans (4) taking problem solving actions, (5) reviewing or check again.

6. Analysis of Student Curiosity

Table 8.
Experimental Class Student Curiosity Data

Student	Pre-	Meeting 1	Meeting 2
S-01	45	60	71
S-02	35	60	71
S-03	55	65	62
S-04	50	70	71
S-05	60	67	96
S-06	45	65	60
S-07	50	60	70
S-08	50	70	70
S-09	60	70	70
S-10	45	65	88
S-11	45	55	60

S-12	60	70	86
Student	**Pre-**	**Meeting 1**	**Meeting 2**
S-13	75	75	80
S-14	72	75	95
S-15	51	60	80
S-16	55	70	80
S-17	60	65	77
S-18	60	75	76
S-19	600	68	90
S-20	70	68	79
S-21	55	56	70
S-22	75	70	79
S-23	80	70	95
S-24	55	54	88
S-25	55	54	86
S-26	55	54	87
S-27	70	83	96
S-28	45	63	78
S-29	45	64	77
S-30	45	62	81
Average	56.1	65.43	78.97

Based on the data from the curiosity questionnaire at the pre-meeting, learning meeting 1 and meeting 2, students in the experimental class experienced an increase in curiosity, this is explained in the following diagram:

Diagram 1.
Curiosity Average Value Chart

Based on diagram 1. in pre-learning students were given a Curiositydan 683 questionnaire with an average score of 56.10, at the first meeting they got an average score of 65.43 and at the second meeting an average of 78.97. So it can be concluded that the experimental class experienced an increase in Curiosity.

In this study it can be concluded that in class V of SDN 03 Legokkalong in the final assessment (posttest) regarding Curiosity there were 3 students in the fair or low category with a percentage of 10%, 16 students in the good or middle category with a percentage of 53.33% and 11 students with very good or top category with a percentage of 37%.

If we look at the data obtained, it can be concluded that in the high or very good category, the indicators of student curiosity have been met, namely the indicators of enthusiasm for finding answers, attention to the object being observed, enthusiasm for the science process, active asking questions during learning, and actively looking for subject matter resources. However, in the middle or good category, there are 3 indicators that are met. Meanwhile, the lower category means that students have fulfilled one of the Curiosity indicators, namely that students are only able to enthusiastically answer the answers in the learning process

- **Discussion**

1. **Quantitative Discussion**

Based on the results of hypothesis 1 research in the experimental class by applying the project based learning model assisted by e-modules, it shows that the average value of students' natural science problem solving abilities regarding respiratory material has reached the KKM. This is based on the two-way Anova test obtained $F_{hitung} > F_{tabel}$, so that H_0 rejected, the three population averages are not identical, in other words the population averages of the science lesson results for students' respiratory material for the class, namely the experimental class with the Project Based Learning learning model assisted by e-modules and the control class with the conventional model are not the same or it can be interpreted that There are differences in the results of science lessons on breathing material for students between those who received the Project Based Learning learning model assisted by e-modules and the conventional model. The results show that the tailed Sig.2 value is 0.275 or less than 0.05, meaning that the average of experimental class students is more than the KKM. The results of this research analysis are in accordance with the hypothesis which states thatStudents' problem solving abilities in the Project Based Learning learning model assisted by E-modules reach classical BTA, namely the proportion of students who achieve learning completeness is more than 75%.

Based on the results of hypothesis 2 from the pretest and posttest scores of the experimental class, there is an increase in science problem solving abilities after implementing the project based learning model assisted by e-modules. This is because the tailed Sig.2 value in the Paired Sample t Test is less than 0.05 so hypothesis 2 is accepted. The increase in problem solving abilities of class V science students at SDN 03 Legokkalong was equal to44.27 from the results of the N-gain calculation, which means that the experimental class experienced a moderate increase.

In the second hypothesis test, the aim is to find out whether there is a significant difference in the achievement of science problem solving abilities between students who receive the PjBL (Project Based Learning) learning model based on E-modules and students who receive conventional learning. The comparison is as follows:

1) **Comparison of science problem solving abilities (initial) between students who received PjBL (Project Based Learning) model learning using E-modules and students who received conventional learning.**

Benjamin S. Bloom in Wulandari (2005) states that initial abilities are very necessary to support students' understanding before being given new knowledge. For this reason, in this study the researcher gave pretest questions to determine initial science problem solving abilities in the control class and experimental class. This is necessary because one of the requirements of explanatory sequential research is that the initial science problem solving abilities of control class and experimental class students must be equivalent, so that it will make subsequent data analysis techniques easier.

The results of the descriptive statistical test of science problem solving ability (initial) in the control class of 30 students were: maximum science score = 87, minimum score = 55, average = 66.40 with median = 6.5, mode = 65, and standard deviation = 8.381. Meanwhile, in the experimental class, the results of descriptive statistical tests on the science problem solving abilities (initial) of 40 students were: maximum science score = 85, minimum score = 55, average = 66.50 with median = 65, mode = 65, and standard deviation = 7.894.

Based on descriptive statistics, the science problem solving abilities (initial) of students who will receive problem-based learning in the experimental class and students who will receive conventional learning are not significantly different at the significance level α = 0.05. So the requirements for quantitative research in the control class and experimental class have been fulfilled.

ResultsThis test shows that there is an influence of the form of learning on students' (initial) science problem solving abilities. The form of learning used in this research is learning using the project based learning (PjBL) model assisted by E-Modules.

The Project Based Learning (PjBL) learning model is based on E-Modules as a step to direct students towards (initial) science problem solving abilities so that students can solve the problems they face. This means that students who study using the project based learning (PjBL) model have been trained in science problem solving abilities.

2) **Comparison of the achievement of science problem solving abilities between students who received Project Based Learning (PjBL) model learning and students who received conventional learning.**

The achievement of science problem solving abilities in the control class and experimental class can be seen from the post-test results. The post-test to measure the achievement of students' science problem-solving abilities was carried out after each student in the control class and experimental class had learned five meetings. Learning in the control class and experimental class is carried out by the same teacher. The difference lies in the treatment of the two classes.

In the experimental class students receive learning using the project-based learning (PjBL) model assisted by e-modules, while in the control class students receive conventional learning. The forms of questions tested in the post-test are the same as those given in the pre-test.

The post-test data in this study is referred to as the achievement of students' science problem-solving abilities. From the results of hypothesis testing using a two-sample t-test independent of one party, it was concluded that the achievement of science problem solving abilities of students who received learning using the project based learning (PjBL) model assisted by e-modules was significantly higher than students who received conventional learning at this level. α = 0.05.

The post-test results showed that students in the control class experienced a change in their average score from 66.40 to 68.00. This means that for students who received conventional learning the increase in the achievement of science problem solving abilities was 2.41. Meanwhile, students in the experimental class also experienced an increase in the average score from 66.50 to 81.33. This means that for students who received learning using the project based learning model assisted by e-modules, the increase in the achievement of science problem solving abilities was 22. 30.

Based on the explanation above, it appears that the achievement of science problem solving abilities of students who receive learning using the project based learning (PjBL) model assisted by e-modules is significantly higher than students who receive conventional learning. Why is that? Achieving science problem solving abilities is an achievement where students appear to be able to solve or find answers to questions in stories, texts and assignments in mathematics learning. Furthermore, indicators of science problem-solving abilities according to researchers include: (1) identifying problems, (2) looking for solutions, (3) creating problem-solving plans (4) taking problem-solving actions, (5) reviewing or re-examining.

Furthermore, based on the results of a simple linear regression test analysis, it shows that there is an influence of curiosity on solving science problems using the project based learning model assisted by e-modules. The results of this analysis are in accordance with hypothesis statement 3, namelyStudents' curiosity has a positive effect on problem solving abilities in the experimental class in learning science material for class V breathing, it was found that the amount of curiosity regarding students' ability to solve natural science problems on respiratory material was 84.7%, meaning that the remaining 15.3% was influenced by other factors. The higher the student's curiosity, the higher and higher the value of solving natural science problems on respiratory material. Based on this, the project based learning model assisted by e-modules is able to increase students' curiosity and improve problem solving abilities in class V breathing science lessons.

So, to achieve science problem solving abilities, students must understand the information they get so they can see, explore problems, try to find solutions by using science ideas to solve problems whether related to science, other scientific disciplines or in everyday life. In connecting, students must be able to understand newly obtained information to direct it to information that has been received previously.

The research results above are also supported by the results of observations during the research. The learning process using the project-based learning method assisted by e-modules brings changes to classroom learning. By practicing a lot of connecting concepts in science, students will be more skilled in working on questions. So, to strengthen the results of quantitative research, the researcher continued with qualitative research.

2. Qualitative Research

In this study, differences were obtained in the ability to solve natural science problems on respiratory material and students' curiosity in subjects in the high, average and low categories. The problem solving steps used are understanding the problem, planning a solution, resolving the problem accordingly and checking again. The differences in the ability to solve natural science problems on respiratory material in each category can be seen in Table 8 as follows:

Table 8
Respiratory Science Problem Solving Ability

Kategori	Subjek	Indikator			
		1	2	3	4
Tinggi	S-13	Memenuhi	Memenuhi	Memenuhi	Memenuhi
	S-22	Memenuhi	Memenuhi	Memenuhi	Memenuhi
Sedang	S-05	Memenuhi	Memenuhi	Memenuhi	Tidak Memenuhi
	S-17	Memenuhi	Memenuhi	Memenuhi	Tidak Memenuhi
Rendah	S-27	Memenuhi	Tidak Memenuhi	Tidak Memenuhi	Tidak Memenuhi
	S-30	Memenuhi	Tidak Memenuhi	Tidak Memenuhi	Tidak Memenuhi

Based on problem solving abilities in subjects with a high category, students are able to fulfill the four existing indicators. Based on the results of the analysis carried out, it can be concluded that subjects in the high category are able to fulfill all the indicators in the four steps in solving natural science problems regarding respiratory material, namely(1) identifying the problem, (2) looking for a solution, (3) making a plan to solve the problem (4) taking action to solve the problem, (5) reviewing or re-examining.

Based on the results of the analysis, it can be concluded that subjects in the medium category are able to fulfill the indicators in the three steps of solving science problems, namely(1) identifying the problem, (2) looking for a solution, (3) making a plan to solve the problem, but not yet able to complete the indicator (4) taking action to resolve the problem, (5) reviewing or checking again properly.

Based on the results of the analysis, it can be concluded that science problem solving abilities at the low category level are only able to fulfill the indicators in one problem solving step(1) identifying the problem, (2) looking for a solution, (3) making a plan to solve the problem (4) taking action to solve the problem, (5) reviewing or re-examining.

This is in line with research conducted by Ofan (2022), which stated that the problem solving method is one of the learning methods that can be chosen and then applied by teachers to increase learning motivation and improve student learning achievement. Increasing student learning through problem solving methods can be achieved well as long as the learning is implemented well. Furthermore, Rahayu (2021), the research results are as follows: the understanding the problem stage is (15.4%), the strategy planning stage is (21.1%), the strategy implementation stage is (18.7%), and the stage of re-checking the correctness of the solution amounted to (5.6%). Based on the results of the average score achieved for the four stages, the lowest average score for students' science problem solving abilities was found at the stage of re-checking the correctness of the solution.

From the results of this qualitative research, three groups were obtained based on the level of science problem solving abilities.Namely, based on the initial test regarding the ability to solve science problems in several students, it is known that there are students who are classified as intelligent, who can complete the test in the correct way and with the correct final results, then students with moderate abilities can only complete a few indicators with incorrect final results, whereas students with low academic abilities, only able to complete one indicator of problem-solving ability, are unable to successfully complete the assignment given.

After the interview was held, the following information was obtained; In group one, smart students can work on all indicators of problem solving, namely identifying problems, finding solutions, creating problem solving plans, carrying out problem solving actions and reviewing. For group two, students with moderate abilities are only able to identify problems and look for solutions, but are not yet able to create problem-solving plans, are not yet able to carry out problem-solving and reviewing actions. Meanwhile, for group three, students with low ability were only able to solve one problem solving indicator out of the five existing problem solving indicators, namely identifying problems.

From the results of the qualitative research analysis, it is known that the group of students with high science problem solving abilities has a high level of curiosity, the group of students with moderate science problem solving abilities has a moderate level of curiosity, and the group of students with low science problem solving abilities has a low level of curiosity. . Based on this description, it can be seen that students' level of curiosity influences their science problem solving abilities.

Conclusion

Based on statistical data analysis, research results and discussion of chapter IV, the conclusions that can be drawn from this research are as follows: (1). The science problem solving ability of students in the Project Based Learning (PjBL) learning model assisted by e-modules reaches classical BTA, namely the proportion of students who achieve learning completeness is more than 75%. (2). The achievement of science problem solving abilities of students who received learning using the Project Based Learning (PjBL) model assisted by e-modules was significantly higher than students who received conventional learning. (3). Curiosity has a positive effect on science problem solving abilities in the experimental class in learning science material for class V breathing.

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