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The Effect of *Resource-Based Learning* Model on Problem Solving Ability of Students at SMA Adabiyah Palembang

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Abstract: The purpose of this study was to determine the significant effect of the Resource-Based Learning model on students' problem-solving abilities. This research uses experimental quantitative research methods. The technique used is using a saturated sampling technique which can be called a census sample selection where all members of the population are sampled. The data analysis technique of this research is to compare the test results of the experimental class and the control class by using the pre-test and post-test normality test, homogeneity test, and hypothesis testing. The results showed that there was a significant effect on the experimental class that had been treated with the Resource-Based Learning (RBL) model on the problem-solving ability of light waves at SMA Adabiyah Palembang, this was evidenced by the results of the problem-solving abilities of the experimental class and the control sample class. From these results, the average problem-solving ability of the experimental class is greater than that of the control class. Then from the analysis obtained using IBM SPSS 15.0 with a t-test value of 0.000 <0.05, it can be concluded that there is an influence of the Resource-Based Learning (RBL) learning model on the ability to solve light wave material physics problems at SMA Adabiyah Palembang.

Keywords: Learning model, Resource-based learning, Problem solving ability

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INTRODUCTION

Education has a very important role to improve the standard of living of a better civilization in the future. The educational process is essentially an interaction that occurs between two parties, namely teachers and students. Education is also a teaching and learning process that occurs at school and outside of school. There are 3 main problems in learning, namely the problem of the factors that influence the occurrence of learning, about how the learning process takes place, and the problem of learning outcomes. So, learning is a process that happens to a person until he gets something from the process (Seto Mulyadi et al, 2016). The existence of a scientific method in learning can also help students understand and solve existing problems and can also reduce problem solving difficulties that are often experienced by students when learning.

Difficulties in problem solving have also been found at SMA Adabiyah Palembang. Based on observations and observations at the school, basically the ability to solve physics problems is relatively low. This can be seen from the practice questions and homework given to students, the questions given by the teacher to students do not develop students' thinking skills to solve a problem, because students tend to only memorize formulas and cannot apply formulas. in the matter. In addition, in the learning process teachers sometimes still use the lecture method and the learning resources used by students are only based on the teacher and one printed book. This is what causes the ability to solve physics problems at SMA Adabiyah Palembang is still relatively low, that's why researchers take the research place at SMA Adabiyah Palembang.

One of the ways in which students' thinking abilities can be developed is through problem solving. With problem solving, a person will be required to think systematically, critically, logically, and have an unyielding attitude to find solutions to the problems at hand. By solving problems, students will try to find the right solution according to their own way to solve the problem.

The improve students' problem-solving abilities, it is necessary to be supported by the right learning model. One way of learning to improve problem solving skills is to find learning resources. In the teaching and learning process, a learning model is needed that is used as a guide in planning learning in class (Sumartini, 2016).

The solution to the problems above can be overcome by applying the appropriate learning models as needed. The use of appropriate learning models for physics lessons will encourage students' interest in learning physics, which will ultimately affect student learning outcomes.

The solution that can help students to solve physics problems is by applying the *Resource Based Learning* (RBL) learning model . Learning *resources* are everything that is used by students during learning, both those that have been provided and those that have been used . Learning resources are not only obtained from teachers, but also obtained from other learning sources, such as the natural environment, books, communities, and *online media information.* Utilization of various learning resources will develop the ability of students to receive and develop subject matter.

Resource based learning (RBL) is a constructivist learning model that utilizes various learning resources. This learning requires students to be active in finding learning resources according to their needs and abilities. The *Resource Based Learning model* has become a learning *trend* because it utilizes various learning resources, both printed, non-printed, and the learner's environment. The teacher's role in this learning is to guide students in determining the learning resource environment they use. The application of the *Resource Based Learning model* changes the teacher's task, which initially only teaches to guide students to learn on their own.

The steps of the *Resource Based Learning Model,* according to Nuraini (2009) quoted in the journal Sri Pajriah (2015) are as follows:

1) The first step is to convey the learning objectives, where the educator expresses the learning objectives that will be studied by students, and as an introduction for students to the material to be studied.
2) The second step is to identify problems or problems, this *RBL step* involves students in finding, collecting and building questions, when questions start to be asked students are guided to determine what information will be needed to answer these questions.
3) The third step is to plan how to find information. Students are facilitated to identify potential sources of information as well as to determine the right way to collect that information, whether through reading books or other printed information, *searching* on the web, direct observation, interviewing, etc. Sources of information must be diverse, sources of information can include print, non-print, or people.
4) The fourth step is gathering information. In this step, students are required to be able to identify (select and sort) what information and facts are important and relevant to research questions which are not, and categorize the findings.
5) The fourth step is to use the information. In the process of gathering information, students will read, hear, touch, or see for themselves the source of the information. After everything is collected, students need to get guidance that what they are doing is not just *copying and pasting* the information obtained but how to use the information in their own words or language, not forgetting to include the source of the information from where or from whom.
6) The fifth step is to synthesize information. Armed with the information that has been obtained, students are guided to organize the information into a systematic, logical and possible arrangement to be understood quickly and correctly by others. Students are asked to plan the best way to present the results to others.
7) The last step is evaluation. This last step is used after the information found is well organized and students are able to express their income.

In addition, the influence of the Resource Based Learning (RBL) learning model on problem - solving abilities has also been widely carried out in previous studies such as those studied by Suharwati, et al (2016) . The result is that the interest in learning in the class that uses the Resource Based Learning model is higher than the class that does not use the Resource Based Learning model, which is evident from almost all students being enthusiastic, interested, and paying attention when learning geography. This causes the experimental class learning outcomes to be higher than the control class. Based on the above background, the author is compelled to conduct a research entitled "The Influence of Resource Based Learning Learning Models on Students' Problem- Solving Ability".

METHOD

The research method used in this research is experimental quantitative research. The samples in this study were 30 students in class XI IPA 1 as experimental class b and class XI IPA 2 as many as 30 students as class In this study, the technique used is using a saturated *sampling technique* or it can be called a census sample selection where all members of the population are sampled. The reason for using this technique is because the school only has 2 classes in class XI IPA, so the selection of this technique is considered the most appropriate.

The variables used in this research are Variable X (independent variable) which is the *Resource Based Learning model* and Variable Y (the dependent variable) which is problem solving ability. There are three research instruments in this study, namely lesson plans, Student Worksheets (LKPD) and *pretest* and *posttest questions.*

The data collection techniques used are tests and non-tests. The test technique in this research is used to determine students' problem-solving abilities through *pretest* and *posttest*. The test results are used to see the students' physics problem solving ability. *Pretest* is used to see quantitative data on students' initial While the *posttest* is used to see quantitative data on the results of physics problem solving abilities after being treated with the *Resource Based Learning* (RBL) learning model. The form of the test used in this study was in the form of a written essay test of the learning material studied.

While the non-test technique is carried out in two ways, namely interviews and also observation. Here the researcher uses unstructured interviews, which are free interviews where researchers do not use interview guidelines that have been arranged systematically and completely for data collection. while observations are made by looking at the state of the school directly.

Furthermore, there are two instrument analysis techniques, namely instrument validity test and reliability test. For the validity test, the assessment instrument is an assessment of the knowledge aspect, the test instrument is tested on class XII science students because they have studied the questions made. And for the reliability test is to find out a measuring instrument can be trusted and reliable in a study.

The data analysis technique used in this research is the pre-test and post-test normality test, homogeneity test and hypothesis testing. The Problem-Solving Ability Indicators in this study are as follows:

Table 1. The Problem-Solving Ability Indicators

Indicators	Deskriptor
Understanding the problem	- Identification of problems based on the concept - Make a list of known problems - Determine the problem asked
Describing the problem in physics terms	Interpret and describe the problem in the design of the concept to be studied.
Planning a solution	Write down the theory or model used in this problem.
Using solution	Implement a solution plan according to the theory and model chosen.
Evaluating solutions	Check the correctness of the selected result.

RESULT AND DISCUSSION

The results of this study were obtained from some data that had been analyzed to determine the problem solving abilities of students. Analysis of problem solving abilities was obtained from the *pretest* and *posttest questions* that had been adjusted to the indicators of problem solving abilities.

Research Instrument Tes

Validity test

Validity test was conducted to determine whether the instrument used in the study was valid or not to be used. First, the Learning Implementation Plan (RPP) is a research instrument that is used as a guide in carrying out the learning process which must first be tested for validity. The Learning Implementation Plan (RPP) instrument is said to be suitable for use because it has been validated by three experts, namely material experts, media experts and language experts. The following is a diagram of the average validation values of the three experts, which are listed below:

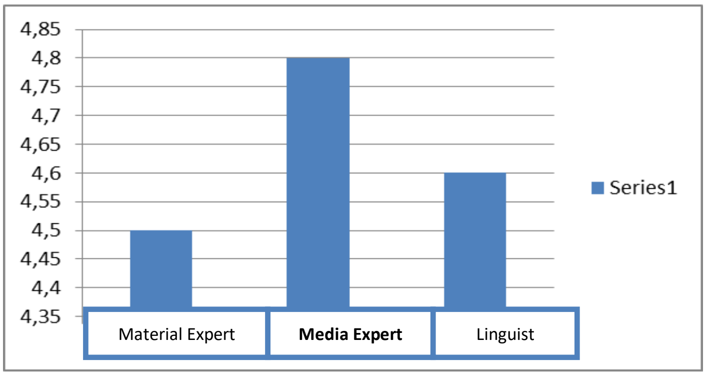


Figure 1. Graph of The Results of the Validity Test of the Learning Implementation Plan

Second, the Student Worksheet (LKPD) is a research instrument that is used as a worksheet that must be completed by students to see problem solving abilities using the *Resource Based Learning* (RBL) learning model that has been developed by researchers who have previously been tested for validity. The Student Worksheet (LKPD) instrument is said to be suitable for use because it has been validated by the three experts. The following diagram shows the average value of the three experts, which are listed below:

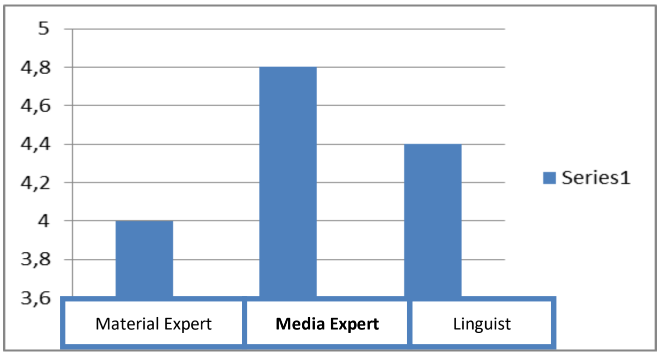


Figure 2. Graph of The Student Worksheet Validity Test Results

Then the last one is the *pretest* and *posttest questions* that have been validated. Each question consists of 5 essay questions and has been declared suitable for use with an average value of the validation of the *pretest questions* of 3.7 (valid) and the *posttest* of 3.5 (valid). Then, the 5 questions that have been validated are tested on 10 students in class XII IPA SMA Adabiyah Palembang. As for finding the validity of the question, the researcher has used SPSS 15.0 where the instrument is said to be valid if it has a minimum item correlation of 0.30. The following is a test of the validity of the *pretest* and *posttest questions*.

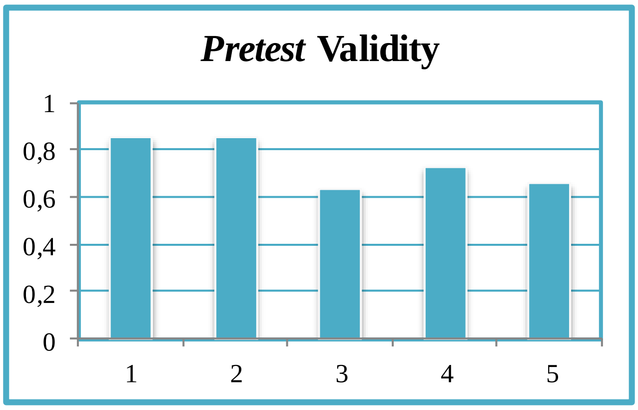


Figure 3. Graph of The Results of Pretest Question Validity Test

Based on the results of the validity test in the table, it is said that all questions are declared valid, because each question number has a calculated r value (*Pearson Correlation*) greater than the correlation coefficient of 0.632 in a significance level of 0.05 for a two-way test where the number of respondents is 10 people.

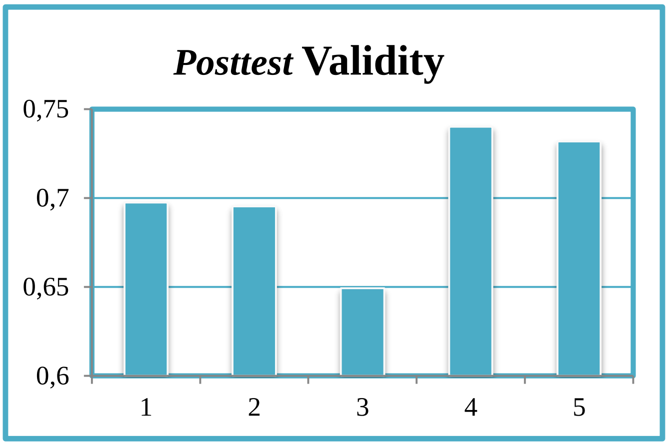


Figure 4. Graph of The Results of the Posttest Question Validity Test

Based on the results of the validity of the *posttest questions* above, it can be stated that each number has a calculated r value (*Pearson Correlation*) greater than the correlation coefficient of 0.632 with 10 respondents, therefore all questions are declared valid.

Reliability Test

The reliability test using *Cronbach's Alpha* which was tested on 10 respondents through *IBM SPSS* 15.0 is the result of the pretest scores as follows:

Table 1. Pretest Reliability Test (Case Processing Summary)

		N	%
Cases	**Valid**	10	100.0
	Excluded (a)	0	.0
	Total	10	100.0

a Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	**N of Items**
.762	5

Based on the table above regarding the reliability test output of the *pretest questions,* it can be seen that the *Cronbach's Alpha value* is 0.762 > 0.65 so that 5 questions are declared reliable. Next for *the posttest questions* are below:

Table 2. *Posttest Reliability Test* (Case Processing Summary)

		N	%
Cases	**Valid**	10	100.0
	Excluded (a)	0	.0
	Total	10	100.0

a Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	**N of Items**
.846	5

Based on the table above regarding the output of the *posttest reliability test,* it can be seen that the *Cronbach's Alpha value* is 0.846 > 0.65 so that the 5 posttest questions are also reliable.

Prerequisite test

Normality test

In this study, the normality test is used as a prerequisite for the t test. The expected data from this study must be normally distributed, because if it is not normally distributed then it cannot be submitted. A distribution is said to be normal if the significance level is > 0.05, preferably if the significance level is < 0.05 then the distribution is said to be abnormal. To test normality using *the Kolmogorof-Sminov test. The following* are the results of the normality test in the experimental class obtained from the *pretest results*:

Table 3. Normality Test *Pretest* Experiment Class (One-Sample Kolmogorov-Smirnov Test)

		nilai_pretest
N		30
Normal Parameters(a,b)	**Mean**	52.67
	Std. Deviation	6.530
Most Extreme Differences	**Absolute**	.203
	Positive	.192
	Negative	-.203
Kolmogorov-Smirnov Z		1.110
Asymp. Sig. (2-tailed)		.170

a Test distribution is Normal.
b Calculated from data.

The data above is the result of the *pretest normality test* in the experimental class whose significance value is 0.170 > 0.05, so it is stated that the residual value is normally distributed. The following is the experimental class data obtained through the *posttest results*:

Table 4. *Posttest Normality Test* Experiment Class (One-Sample Kolmogorov-Smirnov Test)

		nilai_posttest
N		30
Normal Parameters(a,b)	**Mean**	86.37
	Std. Deviation	5.209
Most Extreme Differences	**Absolute**	.189
	Positive	.189
	Negative	-.157
Kolmogorov-Smirnov Z		1.036
Asymp. Sig. (2-tailed)		.233

Based on the results of the normality test for the *posttest results* in the experimental class, it is known that the significance value is 0.233 > 0.05, it can be stated that the residual value is normally distributed as well. Then, in the control class, the results of the normality test were also obtained, namely through the data obtained from the *pretest results.* The following are the results of the pretest normality test in the control class:

Table 5. Pretest Normality Test for Control Class (One-Sample Kolmogorov-Smirnov Test)

		Nilai_pretest
N		30
Normal Parameters(a,b)	**Mean**	49.33
	Std. Deviation	3.880
Most Extreme Differences	**Absolute**	.235
	Positive	.235
	Negative	-.202
Kolmogorov-Smirnov Z		1.285
Asymp. Sig. (2-tailed)		.074

The data above is the result of the *pretest normality test* in the control class whose significance value is 0.74 > 0.05, so it can be stated that the residual value is normally distributed. Finally, the results of the posttest normality test in the control class, along with the data acquisition:

Table 6. Posttest Normality Test for Control Class (One-Sample Kolmogorov-Smirnov Test)

		nilai_posttest
N		30
Normal Parameters(a,b)	**Mean**	73.50
	Std. Deviation	2.980
Most Extreme Differences	**Absolute**	.326
	Positive	.247
	Negative	-.326
Kolmogorov-Smirnov Z		1.786
Asymp. Sig. (2-tailed)		.065

a Test distribution is Normal.

b Calculated from data

Based on the results of the posttest normality test in the control class above, it is known that the significance value is 0.65 > 0.05, so it can be stated that the residual value is normally distributed as well.

Homogeneity Test

Homogeneity test is a test carried out to find out that two or more groups of sample data come from populations that have the same or homogeneous variance. This test is used to ensure that the data group comes from a population that has the same or homogeneous variance.

The basis for taking the homogeneity test decision is that if the significance value is > 0.05 then the data distribution is said to be homogeneous. If the significance value < 0.05 then the data distribution is not homogeneous. Based on the results of the homogeneity test using *One Way Annova* . on the *pretest* and *posttest scores* of the two classes, the following results were obtained:

Table 7. Test of Homogeneity of *Pretest* Experiment Class and Control Class

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
2.067	1	58	.156

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	183.750	1	183.750	3.415	.070
Within Groups	3120.833	58	53.807		
Total	3304.583	59			

From the results of the analysis in the table *0f homogeneity of variances test* , obtained a significance of 0.156> 0.05. Thus the *pretest data* from both groups were homogeneous.

Table 8. Test of Homogeneity of *Posttest* Experiment Class and Control Class

Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
.673	1	58	.415

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3496.067	1	3496.067	121.430	.000
Within Groups	1669.867	58	28.791		
Total	5165.933	59			

From the results of the analysis in the table in the *0f homogeneity of variances test* , obtained a significance of 0.415 > 0.05. Thus the *posttest data* from the two groups were homogeneous.

Hypothesis testing

Test this hypothesis using t-test with *Independent Samples*. *Independent* Test Samples T-test is a test that looks at whether there is a difference in the mean of two unpaired or unrelated samples. The requirement to perform the *Independent Samples T-test* is that the data used is normally distributed and homogeneous. The results of hypothesis testing using SPSS 15.0 are as follows:

Table 9. Hypothesis Test

Group Statistics

	Class	N	Mean	Std. Deviation	Std. Error Mean
posttest	**posttest Control Class**	30	70.33	5.074	.926
	posttest experiment Class	30	85.60	5.642	1.030

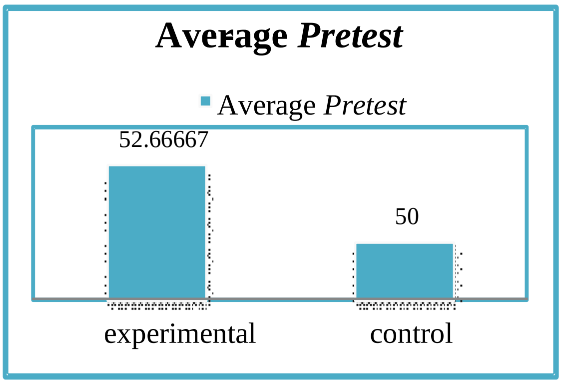
Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
posttest	Equal variances assumed	.673	.415	-11.020	58	.000	-15.267	1.385	-18.040	-12.493
	Equal variances not assumed			-11.020	57.359	.000	-15.267	1.385	-18.041	-12.493

As for the table of output results for the Independent Samples T-test, it shows that the significance value (2-tailed) shows 0.000 where the basis for making the decision to test the hypothesis is if the significance value > 0.05 then H 1 is rejected and H 0 is accepted, on the contrary if the significance value is < 0.05. 0.05 then H1 is accepted and H0 is rejected . The significance table shows a number of 0.000 which means that H 1 is accepted and H 0 is rejected. So it can be concluded that there is an influence of the Resource Based Learning (RBL) learning model on the problem-solving ability of light wave material at SMA Adabiyah Palembang.

Discussion

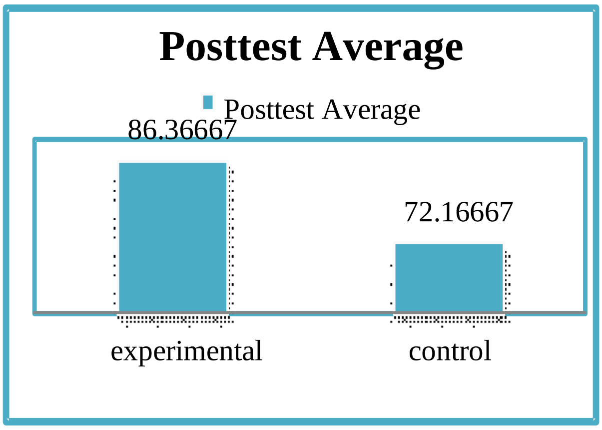
The following is the average *post-test score* for both the control class and the experimental class.



Picture 5. Graph of The Average *Pretest*

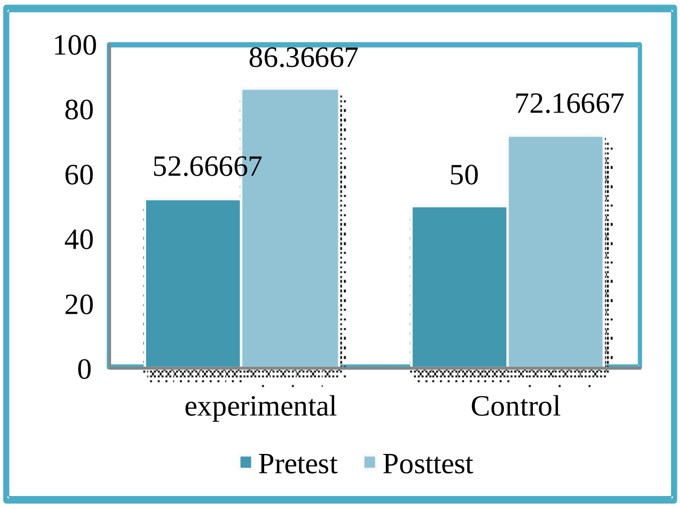
From the graph above, it can be seen that the average value between the experimental class and the control class is not significantly different, the average pretest score for the experimental class is 52.6 and the average *pre-test* for the control class is 50.

The following is the average *post-test score* for both the control class and the experimental class:



Picture 6. Graph of The Posttest Average Score

From the graph above, it can be seen that the average *post-test score in the experimental class is 86.36 and the post-test* average value in the control class is 72.16. From graph 5 and graph 6 above, it can be seen that after being given treatment with different learning models in the two classes there was an increase in the final test scores, along with the average values of the *pre-test* and *post-test* of the two classes:



Picture 7. Graph of The Average *Pretest* and *Post-test*

Based on the results of data processing that has been carried out using the *Paired Samples T-test statistic*, it shows that the significant value shows 0.000 <0.05, indicating that the hypothesis H_0 is rejected and H_1 is accepted. The results of the data analysis above can be concluded that the *Resource Based Learning* (RBL) learning model is effective in improving students' problem-solving abilities in physics learning.

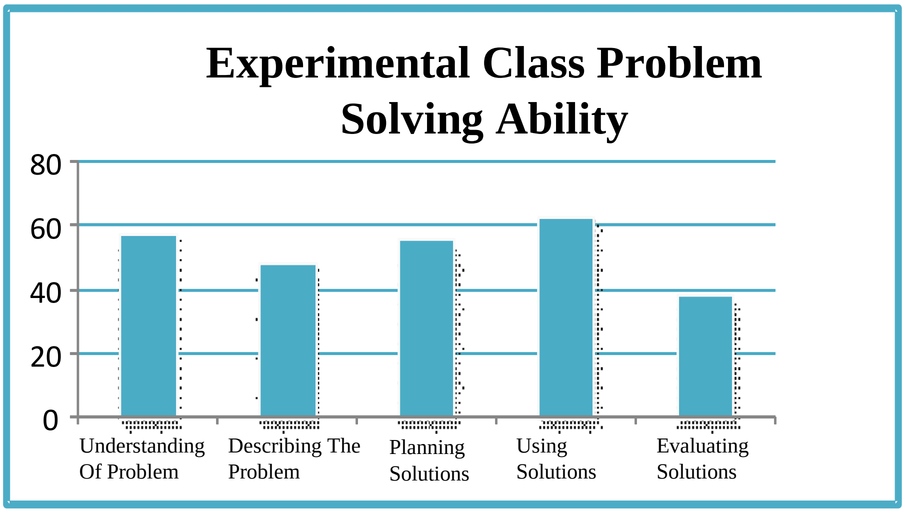
The increased problem-solving abilities experienced by students will increase understanding of the concepts being taught and students are also able to solve various problems related to physics, so this opinion is in line with what was conveyed by Sumartini (2016) to improve students' problem-solving abilities. students, need to be supported by appropriate learning models. One way of learning to improve problem solving skills is to look for learning resources, where the *Resource Based Learning* model itself is a learning model that utilizes various types of learning resources.

The level of problem-solving ability of students in the class studied, namely the control class and the experimental class, was obtained from the average per indicator of problem-solving ability of each item and the score that had been determined from the scoring rubric on the test question lattice made by the researcher. The following are the results of the pretest from the experimental class in the table below:

Table 10. Result of Problem Solving Ability of Experimental Class Pretest Questions

No	Problem Solving Ability Indicator	Percentage Of Problem Solving Ability
1	Understanding Of Problem	57,5
2	Describing The Problem	48,33
3	Planning Solutions	55,83
4	Using Solutions	62,5
5.	Evaluating Solutions	38,33
Total Percentage		262,49
Percentage Average Problem Solving Ability		52,50 (Enough)

From the results of the table above, the average percentage of problem-solving abilities is 52.50 with a sufficient category, as for further inclusion in a graph, the graph of the results of problem-solving abilities in the experimental class is as follows:

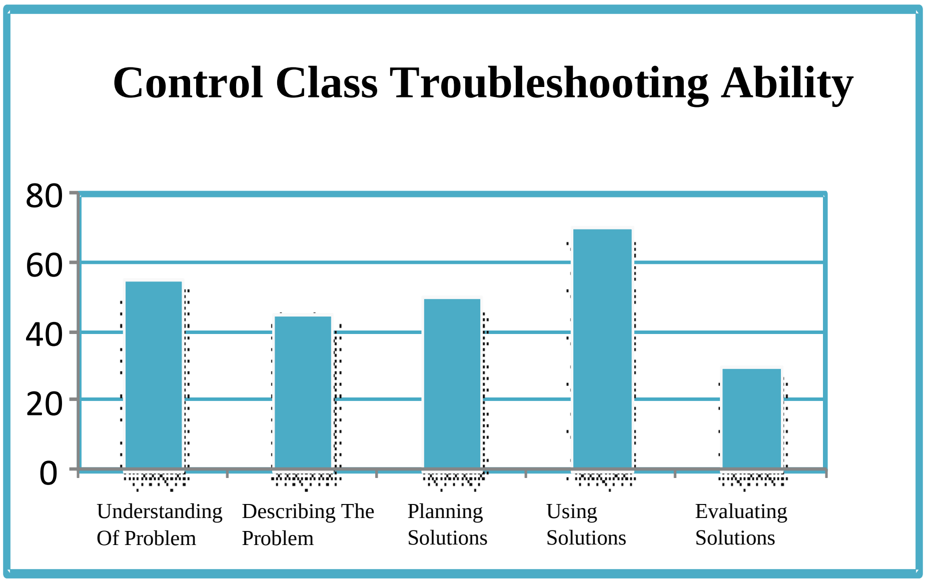


Picture 8. Graph of The Results of Problem Solving Pretest Questions in the Experimental Class

Table 11. Results of Problem Solving Ability Pretest Questions in the Control Class

No	Problem Solving Ability Indicator	Percentage Of Problem Solving Ability
1	Understanding Of Problem	55
2	Describing The Problem	45
3	Planning Solutions	50
4	Using Solutions	70
5.	Evaluating Solutions	30
Total Percentage		250
Percentage Average Problem Solving Ability		50 (Enough)

The average percentage of problem-solving abilities (from Table 11) is 50 with a sufficient category, as for further inclusion in a graph, the graph of the results of problem-solving abilities in the control class is as follows:



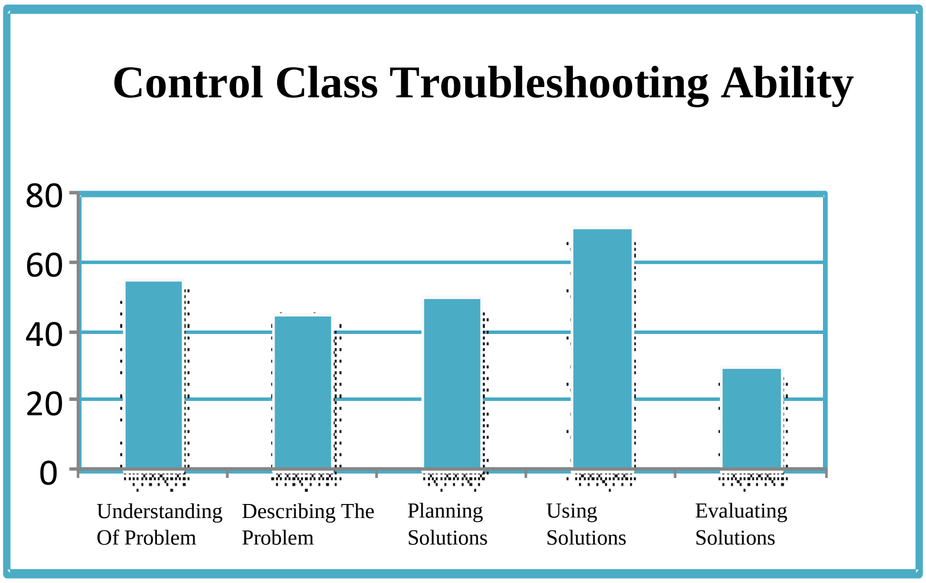
Picture 9. Graph of The Results of Problem-Solving Pretest Questions in the Control Class

The average percentage of problem-solving abilities (from table 12) is 86.13 with a very good category, while it is then included in a graph, the graph of the results of problem-solving abilities in the experimental class is as follows:

Table 12. Result of Problem-Solving Ability *Posttest* Experiment Class

No	Problem Solving Ability Indicator	Percentage Of Problem Solving Ability
1	Understanding Of Problem	60,66
2	Describing The Problem	89,16
3	Planning Solutions	96,66
4	Using Solutions	93,33
5.	Evaluating Solutions	90,83
Total Percentage		430,64
Percentage Average Problem Solving Ability		86,13 (Very Good)

The average percentage of problem-solving abilities (from Table 11) is 50 with a sufficient category, as for further inclusion in a graph, the graph of the results of problem-solving abilities in the control class is as follows:



Picture 9. Graph of The Results of Problem-Solving Pretest Questions in the Control Class

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No	Problem Solving Ability Indicator	Percentage Of Problem Solving Ability
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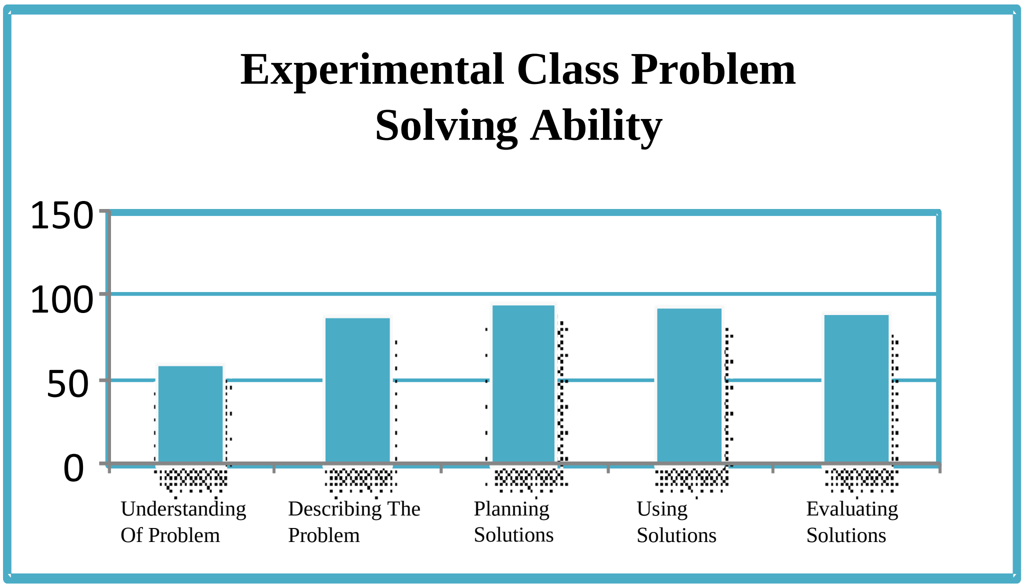
2	Describing The Problem	89,16
3	Planning Solutions	96,66
4	Using Solutions	93,33
5.	Evaluating Solutions	90,83
	Total Percentage	430,64
	Percentage Average Problem Solving Ability	86,13 (Very Good)



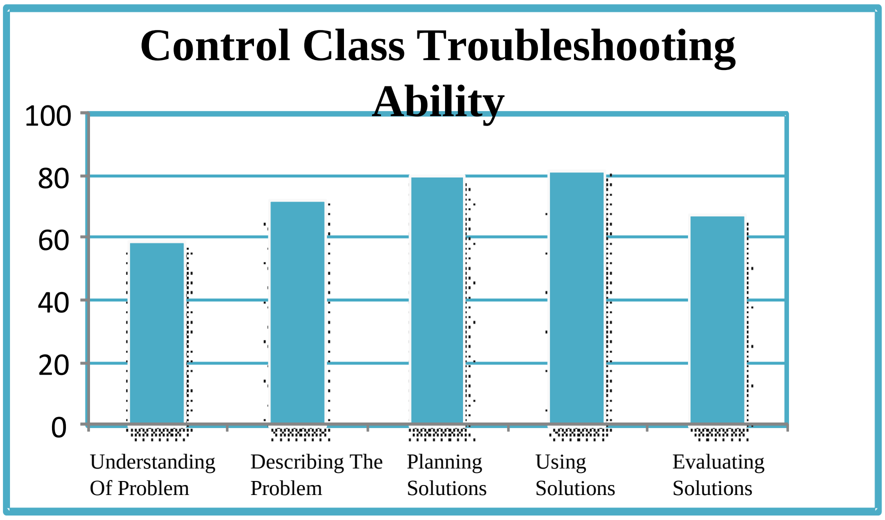
Picture 10. Graph of The Results of Problem Solving *Posttest Problems* in the Experimental Class

The table of problem-solving ability results for the *posttest questions* for the control class is as follows:

Table 13. Results of Problem-Solving Problems in the *Posttest* Control Class

No	Problem Solving Ability Indicator	Percentage Of Problem Solving Ability
1	Understanding Of Problem	59,16
2	Describing The Problem	72,5
3	Planning Solutions	80
4	Using Solutions	81,66
5.	Evaluating Solutions	67,5
	Total Percentage	360,82
	Percentage Average Problem Solving Ability	72,16 (Good)

From the results of the table above, the average percentage of problem solving abilities is 72.16 with good categories, then the data is entered in a graph, then the graph of the results of problem solving abilities in the control class is as follows:



Based on the results of the experimental class and control class problem-solving ability tests that have been obtained, there has been an increase in every aspect of the problem-solving ability indicator. But in this case there are also differences in problem-solving abilities for posttest questions in the experimental class and control class, higher problem-solving abilities are found in the experimental class where each indicator has a greater average than the control class. Thus, the criteria for increasing problem solving abilities experienced by these students will increase understanding of the concepts taught in physics lessons.

CONCLUSION

From the results of the data obtained by the researcher, it can be concluded that there is a significant effect in the experimental class that has been treated with the *Resource Based Learning* (RBL) model.

Furthermore, this is also evidenced by the results of the problem-solving ability of the experimental class sample and the control class for each indicator. From these results, the average problem-solving ability of the experimental class is greater than that of the control class. Then from the analysis obtained using IBM SPSS 15.0 with a t-test value of 0.000 <0.05, it can be concluded that there is an influence of the *Resource Based Learning* (RBL) learning model on the ability to solve physics problems of light wave material at SMA Adabiyah Palembang.

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