

## The Influence Of The Learning Cycle 5e Learning Model On Students' Problem Solving Abilities And Aseritivity Capability On Human Influence On Ecosystems

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### ABSTRAK

The background to this research is based on the results of interviews conducted with science subject teachers at SMP Negeri 3 Sugio, that the learning activities carried out are centered on teachers and students experiencing difficulties in their ability to solve problems and express opinions. This research aims to determine: (1) The influence of the Learning Cycle 5E learning model on problem solving abilities. (2) The influence of the Learning Cycle 5E learning model on assertiveness abilities. (3) implementation of learning by applying the 5E Learning Cycle model. The research was carried out at SMP Negeri 3 Sugio. The research model uses True Experimental Design. The research design was by applying Pretest-Posttest Control Group Design. The sample used was 60 class VII students. Sampling uses Random Sampling. The data analysis technique used was the Ngain test with a score of 78.32%. The results obtained show that the 5E Learning Cycle model has an effect on problem solving abilities and is included in the effective category. The results of the assertiveness ability test were obtained from observation and on average obtained a score of 78.62%, including in the very good category. Observation of learning implementation after an average score of 90.8% was included in the very good category.

**Keywords:** *Assertiveness ability, problem solving ability, Learning Cycle 5E learning model.*

### INTRODUCTION

A learning model is a conceptual structure that includes systematic steps to organize the learning process to achieve predetermined goals. Its function is as a guide for learning designers and teachers in carrying out learning activities according to the plan that has been prepared (Tayeb, 2017). The use of learning models can have a significant influence on increasing student knowledge so that it can make it easier for students to solve the problems they face (Suhandi & Robi'ah, 2022).

According to the results of interviews conducted with science teachers at SMP Negeri 3 Sugio, the learning carried out is still largely focused on the teacher (teacher center), many students are still less active in the learning process, and rarely ask questions or express their opinions. Based on previous research, many students only listen to what the teacher has said (lecture method) so that students are still not fully involved. Many still use teacher-centered learning methods, there are teachers who only deliver material and do not make students the main center in the learning process (Rivalina & Siahaan, 2020). In the world of education, it is known that teachers prefer to teach with a monologic approach. Students are required to accept what is conveyed by the teacher without being given the opportunity to express their opinions (Sandria et al., 2022).

Model Learning Cycle 5E adalah model pembelajaran yang dikembangkan oleh Karplus dan Their pada tahun 1960. Dalam langkah pembelajarannya terdapat 5 tahapan yang perlu dilakukan yaitu: peningkatan minat (engagement), eksplorasi (exploration), penjelasan (explanation), elaborasi (elaboration/extention), dan evaluasi (evaluation) (Djabba, 2021). Tahapan tersebut yang akan membantu siswa terlibat aktif dalam proses pembelajaran. Terciptanya proses belajar aktif pasti tetap akan melibatkan pendidik didalamnya. Guru dapat berperan sebagai pendamping dengan mengarahkan siswa pada setiap fase belajar yang telah direncanakan.

The Learning Cycle 5E learning model can increase students' activity and mastery of concepts (Asmuni, 2020). The Learning Cycle 5E learning model can improve geography learning outcomes (Makur et al., 2023). Based on previous research that has been carried out, the Learning Cycle 5E

model can have an influence on students' discipline and learning outcomes (Aditya et al., 2019). In addition to learning models to help students become more active, there needs to be a relationship between the abilities possessed by students so that they can provide good results, which can be done by a teacher, one of which is by providing problems related to the material so that it can attract students' interest in the learning process. In this study, the researcher applied the Learning Cycle 5E model to students' problem-solving and assertiveness abilities. Problems are still related to a condition experienced by a person or group, in the world of education, giving problems is needed to train students' critical and logical thinking skills. Problem solving is a process that has been designed and planned, then implemented to get a solution to a problem (Akuba, Stefy Falentino, Purnamasari Dian, 2020).

The purpose of this study was to determine the effect of the Learning Cycle 5E learning model in improving students' problem-solving abilities and assertiveness skills in the material on human influence on ecosystems at SMP Negeri 3 Sugio.

## RESEARCH METHODS

This study applies a quantitative method, the type of research used based on the natural place of the research site is experimental research (True Experimental Design). The design used in this study is Pretest-Posttest Control Group Design. The independent variable of this study is the application of the Learning Cycle 5E learning model. The dependent variables in this study are students' problem-solving abilities and assertiveness abilities. The control variable in this study is the 7th grade students of SMP Negeri 3 Sugio with the material of human influence on ecosystems. This research was conducted at SMP Negeri 3 Sugio with the research implementation time in January and February 2024 in the even semester. The population of this study were 7th grade students at SMP Negeri 3 Sugio with a total of 210 students who had registered in the even semester of the 2023/2024 academic year. The sample taken from this study was by using 2 classes with a total of 60 students.

## RESULTS AND DISCUSSION

### Result

Normality test is conducted to determine whether the data obtained from the results of the Pre-test and Post-test in the experimental class and control class are normally distributed or not. Based on the results of the normality test, it is known that the pre-test significance values are  $0.600 > 0.05$  in the experimental class and  $0.750 > 0.05$  in the control class. The post-test significance value is  $0.087 > 0.05$  in the experimental class and  $0.094 > 0.05$  in the control class. So it can be concluded that the values are normally distributed.

Homogeneity test is conducted to determine whether the data obtained from the results of the Pre-test and Post-test in the experimental class and control class are homogeneous or not. Based on the results of the homogeneity test, it is known that the pre-test value in the experimental class and control class has a significance of  $0.656 > 0.05$ . The post-test value in the experimental class and control class has a significance of  $0.154 > 0.05$ . So it can be concluded that the value is normally distributed.

The N gain test was used by researchers to determine the category of improvement in problem-solving abilities before and after the application of the Learning Cycle 5E learning model to the experimental class and control class on students' problem-solving abilities on the material on human influence on ecosystems.

Results of the N gain score test calculation			
Experimental Class		Control Class	
Student	N-Gain Score (%)	Student	N-Gain Score (%)
1	82,43	1	53,33
2	80,82	2	45,21
3	79,17	3	41,56
4	78,48	4	39,47

<b>Results of the N gain score test calculation</b>			
<b>Experimental Class</b>		<b>Control Class</b>	
<b>Student</b>	<b>N-Gain Score (%)</b>	<b>Student</b>	<b>N-Gain Score (%)</b>
5	72,00	5	39,74
6	71,79	6	53,16
7	77,63	7	51,85
8	75,95	8	36,11
9	78,48	9	35,62
10	79,73	10	35,71
11	71,23	11	37,84
12	82,43	12	57,83
13	77,33	13	52,56
14	76,00	14	62,03
15	90,91	15	48,00
16	77,63	16	54,67
17	76,54	17	53,25
18	75,95	18	36,11
19	75,00	19	40,79
20	74,67	20	42,31
21	76,62	21	44,03
22	77,22	22	36,71
23	88,46	23	26,67
24	81,82	24	37,33
25	77,33	25	36,99
26	80,26	26	41,89
27	74,03	27	35,53
28	87,01	28	41,33
29	75,95	29	43,42
30	76,83	30	39,19
<b>Total number</b>	<b>2349,7</b>	<b>1300,51</b>	
<b>Average</b>	<b>78,32%</b>	<b>43,35%</b>	

Based on the results obtained, it can be concluded that the N gain test obtained by the experimental class was 78.32%, which is classified as effective, while the control class obtained 43.35%, which is classified as less effective.

The results of the t-test show that the pre-test and post-test values in the experimental and control classes obtained a significance of  $0.000 < 0.05$  based on the hypothesis that had been made, so  $H_a$  was accepted and  $H_o$  was rejected, thus obtaining the result that the 5E learning cycle learning model had an effect on students' problem-solving abilities.

Assertiveness ability test is used to determine the assertiveness ability possessed by students. Obtained from observations of learning activities, at the stage of class discussion or expressing opinions adjusted to the learning stage that has been prepared. The assessment is based on the assessment instrument that has been created by the researcher. The results of the assertiveness ability values possessed by students can be seen in the table.

<b>No</b>	<b>Indicator</b>	<b>Experimental Class</b>	<b>Control Class</b>
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1.	Social skills in collaboration	83,11	60,25
2.	Expressing opinions	80	45,11
3.	Communicating well and openly	75,5	61,23
4.	Defending the right to express opinions	81	55,13
5.	Communicating with good expression	73,52	47,21
	<b>Avarage</b>	<b>78,62 %</b>	<b>53,78 %</b>

Based on the table above, it can be seen that the assertiveness ability of students in the experimental class obtained an average score of 78.62%, including the very good category. While in the control class, the average score was 53.78%, including the good category.

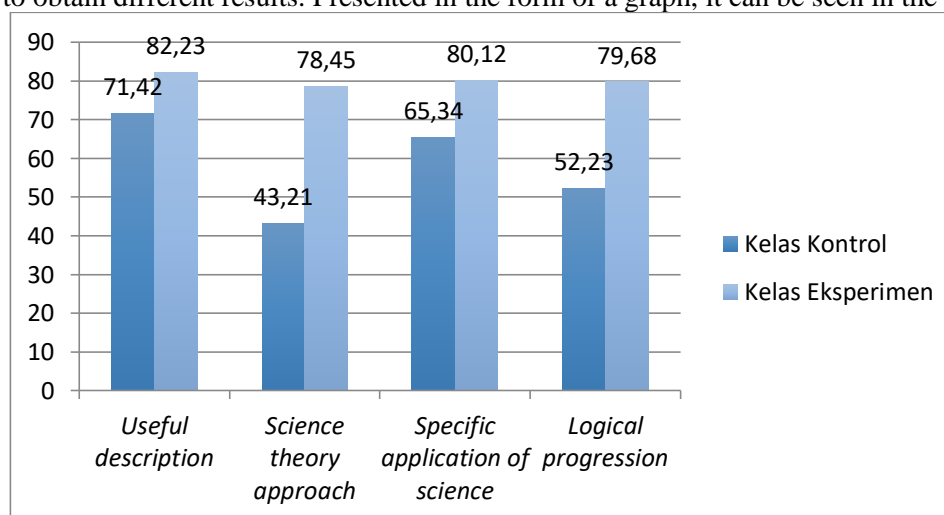
The analysis of the implementation of learning with the Learning Cycle 5E method was observed by three observers, namely a Science Education teacher and two Science Education students from UNISLA. The implementation assessment was carried out on the activities of researchers and students from the beginning to the end of the learning process. The observers gave a check mark (√) in the assessment score column that had been provided. The results of the observation of the implementation of learning can be seen in the table.

Observer	Observer 1	Observer 2	Observer 3	Avarage
Eksperimental	90,9	93,1	88,6	90,8%
Control	84	81,8	77,2	81%

On the learning implementation sheet with the Learning Cycle 5E method in the experimental class after averaging from 3 observers, the value obtained was 90.8% and was included in the very good category. In the control class after averaging from 3 observers, the value obtained was 81% and was included in the very good category.

## Discussion

The Learning Cycle 5E learning model can influence students' problem-solving abilities. The assessment results can be seen in Table 4.1. This is proven by the results of the pre-test and post-test scores which differ between the experimental and control classes. The indicators that have been entered in the pre-test and post-test questions are then averaged between the experimental and control classes to obtain different results. Presented in the form of a graph, it can be seen in the graph.

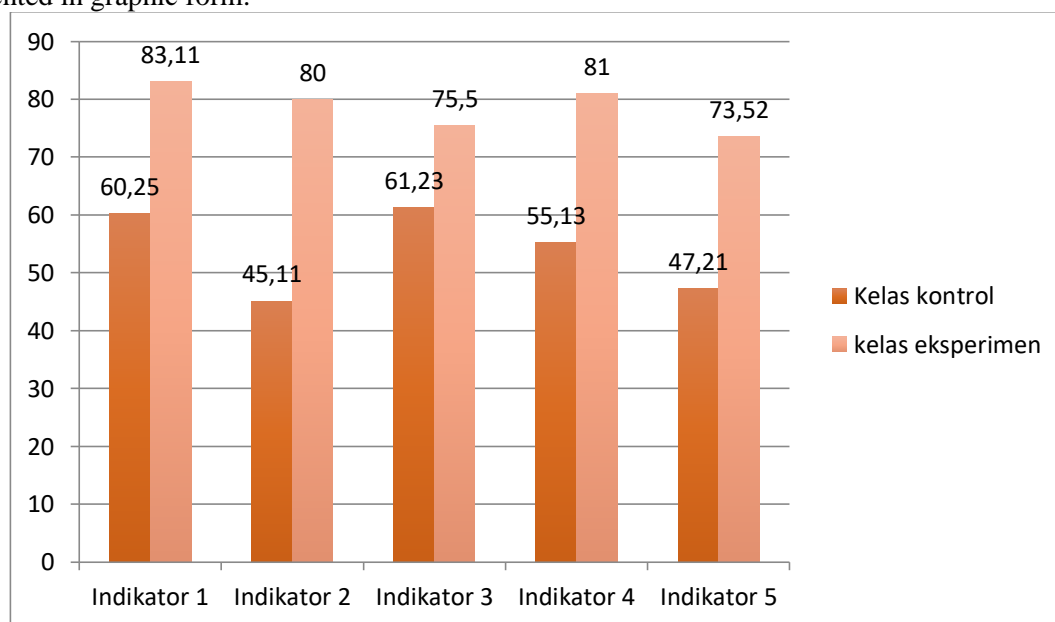


There is a difference between the experimental class and the control class after being treated by applying different learning models. The experimental class has higher results compared to the control class. Each indicator experienced an increase in results in the experimental class because it was influenced by the learning model that had been applied. The Science theory approach indicator experienced a fairly high increase because it was influenced by the learning flow applied. In the

experimental class, it was adjusted to the stages of the Learning Cycle 5E learning model, namely the exploration stage where students were given the opportunity to find new sources of knowledge information that could be searched for from several sources so that students could be directly involved. While in the control class, a conventional learning model was applied, namely teacher-centered learning and students only received less information because knowledge could only be obtained from the teaching teacher. Judging from the results of the pre-test and post-test scores between the control class and the experimental class, there were differences in scores so that it can be concluded that the Learning Cycle 5E learning model affects students' problem-solving abilities. The Learning Cycle 5E learning model applied can affect students' problem-solving abilities (Ma'arif et al., 2020)

This study shows that the use of the Learning Cycle 5E learning model can improve students' problem-solving abilities and provide results in the high category. Factors that influence problem-solving ability include self-confidence, motivation, habits, social support and communication as factors that influence problem-solving ability (Tanjung & Nababan, 2019). However, there are several factors that hinder observations that can affect students' problem-solving abilities. One of these obstacles is the difficulty in coordinating students during the learning process, especially when implementing learning in experimental classes. When implementing the 5E Learning Cycle syntax, students are less organized and pay less attention to teacher guidance, making it difficult to control student success. This can have an impact on students' problem-solving abilities.

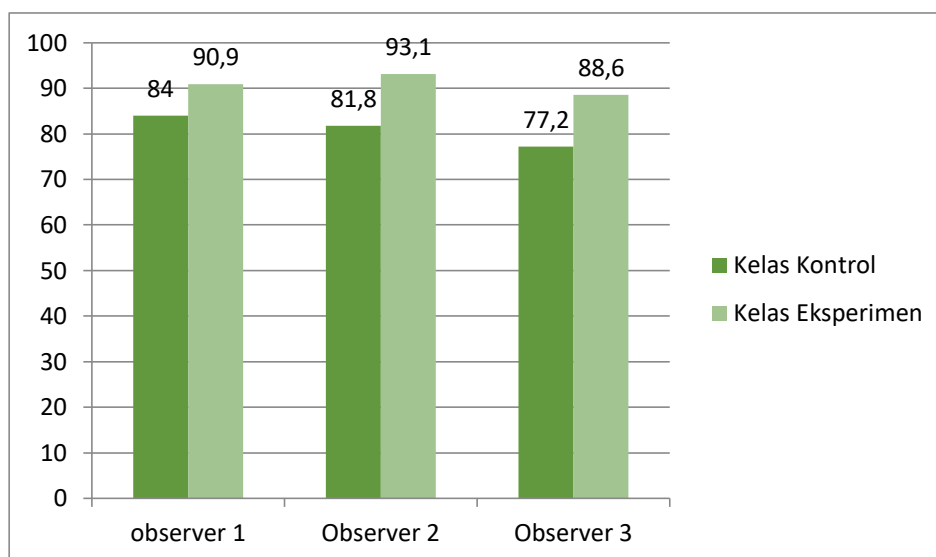
The Learning Cycle 5E learning model can influence students' assertiveness skills. Proven by the results of observations of the activities carried out. Observations were carried out with the help of subject teachers and students of the UNISLA Science Education Study Program. The results of observations of the assertiveness skills possessed by students in the experimental class by applying the Learning Cycle 5E learning model can be seen in table 4.6. In the control class by applying the conventional learning model. Students experienced differences in scores between the experimental class and the control class. The difference in scores can occur due to differences in treatment with different learning models. The application of the Learning Cycle 5E model obtained higher results, which means that the model applied can affect students' assertiveness skills. Based on the results of previous research that has been carried out, it was found that the Learning Cycle 5E learning model can affect students' assertiveness skills (Lubis et al., 2023). Based on the data obtained in table 4.6, it is presented in graphic form.



Based on the graph above, it can be seen the difference between the assertiveness skills obtained from the observation results of the experimental class and the control class, this is influenced by the learning model applied. The assessment results are taken from each percentage of the assertiveness ability indicator. There are five indicators that are owned, including: social skills in

working together, expressing opinions, communicating well and openly, defending the right to express opinions, communicating with good expressions.

Researchers can find out the extent of their conceptual understanding by concluding the learning outcomes together. The implementation of learning went very well, students were also able to play an active role because they had the opportunity to express their opinions, learning was student-centered because it implemented the 5E learning cycle model. In the control class, researchers carried out learning activities adjusted to the learning flow usually carried out by subject teachers who teach at the school so that based on the model applied, students were less active, unlike those implemented in the experimental class.



Based on the graph above, it can be seen that the application of the Learning Cycle 5E learning model in the experimental class obtained better results compared to the application of other learning models in the control class. This is influenced by the maximum involvement of students in the learning process, and indicators of the application of this principle can be seen from the questions asked by students, their ability to solve problems, and decision making related to the subject. The application of the Learning Cycle 5E learning model can affect student learning activities (Pratama et al., 2023). Choosing the right learning model can help achieve the planned research objectives.

## CONCLUSIONS

The learning outcomes that have been implemented by applying the Learning Cycle 5E model obtained an average result of 78.32%, including in the effective category, so it can be stated that the Learning Cycle 5E learning model has an effect on students' problem-solving abilities. In the implementation of learning by applying the Learning Cycle 5E model, when observations were made on students' assertiveness abilities, an average result of 78.62% of all indicators was included in the very good category. Based on the results of observations of learning activities that have been implemented by applying the flow of teaching modules that have been adjusted to the syntax of the Learning Cycle 5E model, an average result of 90.8% was included in the very good category.

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