BioTeach: Biology Science and Biology Education Journal

journal.ininnawaparaedu.com
Vol 01, No 01, Maret 2024

The Influence of the Problem Posing Learning Model on the Learning Outcomes of Class X Students of SMA Negeri 1 Bantaeng on Biodiversity Material

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ABSTRAK

Penelitian ini merupakan penelitian eksperimental dengan jenis penelitian Desain Eksperimen Kuasi yang bertujuan untuk menentukan pengaruh model pembelajaran problem posing terhadap hasil belajar biologi mengenai materi keanekaragaman hayati di Kelas X SMA Negeri 1 Bantaeng. Variabel independen dalam penelitian ini adalah penerapan model pembelajaran problem posing dan model pembelajaran konvensional, sedangkan variabel dependennya adalah hasil belajar siswa pada materi keanekaragaman hayati. Populasi dalam penelitian ini adalah seluruh siswa di kelas X SMA Negeri 1 Bantaeng. Data penelitian diperoleh dengan memberikan tes hasil belajar mengenai materi keanekaragaman hayati dalam bentuk pre-test dan post-test. Teknik analisis data dilakukan menggunakan analisis kovariat (Anakova). Berdasarkan hasil analisis, P = 0.000 lebih kecil dari α = 0.05. Dapat disimpulkan bahwa penerapan model pembelajaran problem posing memiliki pengaruh signifikan terhadap hasil belajar biologi kelas X SMA Negeri 1 Bantaeng pada materi keanekaragaman hayati.
Kata kunci: problem posing, hasil belajar

ABTRACT

This research is an experimental research with the Quasy Experiment Design research type which aims to determine the effect of the problem posing learning model on biology learning outcomes regarding biodiversity material in Class X SMA Negeri 1 Bantaeng. The independent variable of this research is the application of problem posing learning models and conventional learning models, while the dependent variable is student learning outcomes on biodiversity material. The population of this study was all students in class The research data was obtained by giving a test of learning outcomes on biodiversity material in the form of a pre-test and post-test. The data analysis technique was carried out using covariate analysis (Anakova). Based on the results of the analysis, P = 0.000 is smaller than α = 0.05. It can be concluded that the application of the problem posing learning model has a significant effect on the biology learning outcomes of class X SMA Negeri 1 Bantaeng on biodiversity material.
Keywords: problem posing, learning outcomes

1. INTRODUCTION

Education plays a crucial role in ensuring the survival of a nation and state, as it serves as a means to enhance and develop the quality of human resources. The progress of a country can be seen from the success of its education system, making education a determinant of whether a country develops or not (Kurniawati, 2022). The quality of education is a factor influencing the quality of learning. Education practitioners, especially educators, are required to be more creative and innovative in implementing the learning process in the classroom. Educators play a role in determining the quality of students' learning, which includes the students' activeness and independence, their ability to motivate learning, and their ability to provide facilities that support the successful implementation of the learning process.

The implementation of the learning process is inseparable from the instructional models used to support the teaching and learning process. The use of appropriate instructional models influences students' understanding in receiving and comprehending the material conveyed by the teacher, as evidenced by the

learning outcomes obtained by the students (Ananda & Aini, 2022). However, various situations often encountered in the school learning process show that the use of direct instructional models is still prevalent. Direct instruction is a teaching pattern that emphasizes the authority of the educator in learning, where students mostly listen to explanations and complete tasks given by the teacher, resulting in a teaching approach oriented solely towards the teacher and one-way communication from the teacher to the students. Meanwhile, the demands of the current era require classroom learning processes to be conditioned in two-way communication, both between the teacher and the students and vice versa. To ensure that this communication can take place, teachers as learning facilitators must be capable of developing their instructional models to facilitate students' learning (Zulaihah et al., 2014).

One way to address issues in determining appropriate teaching strategies is by using a variety of instructional models, including the problem posing model. Problem posing is an innovative instructional model that can enhance students' engagement in the learning process. This aligns with the definition of problem posing presented by Siswono (2018), which states that problem posing is a teaching model that encourages students to create new questions or problems based on the given information and then seek solutions to the questions or problems they have created.

Every learning activity is expected to yield maximum learning outcomes. Learning outcomes are the ultimate goal after the learning process, which can be demonstrated through grades given by teachers from the number of study fields learned by the students. Andalia (2019) reveals that the problem posing instructional model has the potential to improve students' learning outcomes. This is because in problem posing activities, students think and act independently in practicing creating and solving problems based on the information provided earlier. This is different from the direct instructional model, which is more centered on the teacher's role, thus reducing opportunities for students to develop their own understanding.

2. RESEARCH MATHODS

The type of research used in this study is Quasi Experiment. The research design used in this study is the pretest-posttest comparison group design. In this design, two groups are selected randomly. The group will first be given a pre-test, then given treatment and finally given a post-test. The specific design is explained in the following table

Tabel 1 Model Desain Penelitian

Kelompok	*Pre-test*	Perlakuan	*Post-test*
I	O_1	X	O_2
II	O_3	-	O_4

Sumber: (Sugiyono, 2019)

Keterangan :
I : Kelompok eksperimen
II : Kelompok kontrol
O_1 : Pretest kelompok eksperimen
O_2 : Posttest kelompok eksperimen
O_3 : Pretest kelompok kontrol
O_4 : Posttest kelompok kontrol
X : Pembelajaran dengan model *problem posing*

The population in this study were all students in class class X at SMA Negeri 1 Bantaeng. The sampling technique used in this study is simple random sampling. he sample in this study amounted to 67 people, with the results of the sample selection of class X 9 as the experimental class and class X 2 as the control class. The instrument used in this study is a learning outcome test in the form of a multiple-choice test consisting of 30 items accompanied by five answer choices. Data collection for the research is conducted through two tests: before the group receives treatment (pretest) and after the group receives treatment (posttest). The data analysis techniques used in this study are descriptive statistical analysis and

inferential statistical analysis. To test the research hypothesis, use Anocova analysis with the Statistical Package for Social Science (SPSS) 20.0 for Windows. Before carrying out data analysis, the data obtained is first assumed to be normality and homogeneity tests.

3. RESULT AND DISCUSSION

3.1 Descriptive Analysis

The results of the descriptive analysis of biodiversity content taught in the experimental (problem posing) class and the control (conventional) class can be seen in Table 2.

Tabel 2. Statistik Deskriptif Nilai Tes Hasil Belajar Siswa

Statistik Deskriptif	*Pre-test*		*Post-test*	
	Problem Posing	**Konvensional**	***Problem Posing***	**Konvensional**
Maximum	70	70	93	87
Minimum	27	17	60	53
Mean	48.68	45.82	76.65	67.88
Standar Deviasi	10.605	11.120	9.464	8.230

Table 2 shows low pre-test learning outcomes in both classes. Students' learning outcomes in the post-test increased after being given treatment, both in the class using the problem posing learning model and the class taught using the conventional model. The mean post-test score for the problem posing class is 76.65, categorized as good, while the conventional class scored 67.88, categorized as sufficient.

3.2 Inferential Analysis

1. Normality Test

Normality test in this study was conducted using the Kolmogorov-Smirnov test in the SPSS program. The data from the normality test results can be seen in the table 3.

Table 3. Normality Test

Statistik	*Pre-test*		*Post-test*	
	Problem Posing	**Konvensional**	***Problem Posing***	**Konvensional**
Uji *Kolmogrof-Smirnov*	0.114	0.193	0.111	0.066

Based on table 4.4, it can be seen that the Sig. value on the learning outcomes test for classes taught with problem posing and conventional models is greater than 0.05. In accordance with the criteria for significant normally distributed data, if the value of Sig. > 0.05, it can be concluded that the data in classes taught using the problem posing model and conventional classes are normally distributed.

2. Homogeneity Test

The homogeneity test in this study was obtained using the Homogeneity of Variance test in the SPSS program with the criteria if the significance value <0.05, it can be concluded that there is a difference in the variance of the values of the two groups (heterogeneous), if the significance value> 0.05, it can be concluded that there is no difference in the variance of the values of the two groups (homogeneous). The data of homogeneity test results can be seen in table 4.

Tabel 4. Homogenity Test

Statistik	Tes Hasil Belajar
Uji *Homogenity of Variance*	0.308

Based on table 4, it can be seen that the Sig. value on the learning outcomes test is 0.308. In accordance with the criteria for significant data variance data, if the value of Sig. > 0.05, it can be concluded that the sample has a homogeneous variance. Based on these data, it can be concluded that the classes taught using the problem posing model and conventional classes in this study come from a homogeneous population.

3. Hypothesis Test

Hypothesis testing was conducted using Ancova (Analysis of Covariance) in the SPSS program to determine significant differences between two or more groups of data. If the significance value from the hypothesis testing is < 0.05, it is concluded that there is an influence of the treatment given on the dependent variable.

Tabel 5. Hypotesis Test

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	22461.930[a]	3	7487.310	76.093	.000	.637
Intercept	478363.854	1	478363.854	4861.562	.000	.974
Kelas	22461.930	3	7487.310	76.093	**.000**	.637
Error	12791.630	130	98.397			
Total	514419.000	134				
Corrected Total	35253.560	133				

Based on Table 5, it can be observed that the significance value obtained is > 0.05, indicating that there is an influence of problem posing learning on learning outcomes.

Discussion

Based on descriptive and inferential tests that have been carried out, it can be concluded that there is an effect of treatment differences between two classes taught with different learning models. The problem posing learning model has a positive and significant effect on improving student learning outcomes compared to the use of conventional learning models. Problem posing makes learning in the classroom more effective. The use of problem posing models in biology subjects on biodiversity material affects student learning outcomes to increase. This is inseparable from the problem posing syntax applied to the experimental class.

The first step in the problem posing syntax is lesson preparation. At this stage, the teacher prepares the teaching materials, presents the class schedule, and outlines the subject and learning objectives that students need to achieve. According to Effendi (2017), students' readiness to learn is one aspect that affects their learning outcomes.

The second step in the problem posing syntax is group formation. The teacher divides the students into several groups and distributes worksheets to them. Then, the students discuss the taught material concepts. This stage is marked by providing initial instructions (seed) to the students by the teacher. This initial knowledge, referred to by Mishra and Iyer as "Seed Knowledge" or explicit knowledge seeds that have components that can encourage exploratory questions from students. Like the statement by Mayer & Moreno cited by Mishra & Iyer "The initial instruction was light (less in content), and short (of short time), to ensure that students assimilate most of its contents." Students are free to take notes or write questions together to solidify their understanding (Mishra & Iyer, 2015).

The third step in the problem posing syntax is presenting the problem. The teacher presents a problem as an exercise, containing data or information but not yet accompanied by questions. Students are expected to understand the presented problem.

The fourth step of the problem posing syntax is creating questions. Students are asked to pose questions or problems related to the initial knowledge provided by the teacher in the previous stage. In the classroom, students discuss tasks and question creation with their group mates. This activity allows students to ask more straightforward questions to solve more complex questions. According to Agustina et al. (2018), discussion is a process of exchanging information, opinions, and experiences to gain a better understanding of something or to prepare and make joint decisions.

The fifth step of the problem posing syntax is exchanging and working on questions. After completing question creation, students then share their questions with other classmates or groups. In-depth discussion greatly aids student learning. There are no more students playing, daydreaming, or talking to themselves. They work on the tasks assigned by the teacher together.

The sixth step of the problem posing syntax is presenting and evaluating. The activity carried out by students is to present the results of their group work. Discussion followed by presentation enhances students' understanding and attention in learning because they can interact with other groups to share knowledge. According to Sulvia & Rian (2019), presentations can increase students' activity, understanding, mastery, and attention to the subject. Presentations give students the opportunity to actively participate in learning activities, allowing them to interact with each other and share information.

Based on the data obtained in this research, there is a difference between the control class and the experimental class from the pretest to the posttest score. The data in the experimental class show that there is an improvement in student learning outcomes after being taught using the problem posing learning model.

Indicators that can determine the improvement in pretest and posttest learning outcomes can be seen from the learning objectives to be achieved by students and the average score obtained after learning. Based on the data, the problem posing class shows an increase in the number of students who answered correctly for the set learning objectives. For example, before being taught using the problem posing learning model, the number of students who answered correctly for item number 15 was 20 students. However, after treatment, it increased to 33 students. Additionally, another success indicator is the average posttest score obtained. The data from this research show that the average posttest score for the class taught using the problem posing learning model is 76.65, which falls into the good category. The use of the problem posing model in biology subjects on biodiversity material influences an increase in student learning outcomes.

This is in line with Nuridayanti et al. (2020), stating that student learning outcomes with the application of the problem posing learning model are greater compared to conventional learning models, and there is an influence of applying the problem posing learning model on student learning outcomes. Furthermore, this research aligns with the findings of da Ponte & Henriques (2013), stating that the application of the problem posing learning model can engage students actively in asking questions about the given data, searching for and formulating alternative answers from a series of examples given, and generalizing to obtain a general solution to the given problem.

The implementation of different treatments in delivering and presenting materials to students, in the experimental class, students create and answer their own questions not as tests but as a learning model to activate students in learning. The demand to create questions and answer them themselves makes students active in searching various sources and references to meet the demands of learning. This stimulates critical thinking skills and deepens concepts by students, making them more capable of understanding the learning material provided. Based on this research, it can be concluded that the problem posing learning model can improve student learning outcomes. Based on the description above, the hypothesis stating that there is an influence of the problem posing learning model on biology learning outcomes on biodiversity material in Class X of SMA Negeri 1 Bantaeng is proven to be true.

4. CONCLUSION

Based on the results of data analysis and discussion that has been stated, it can be concluded that the learning outcomes of students taught using the problem posing learning model have an average value of 76.65 with a good category. And there is an effect of the problem posing learning model on student biology learning outcomes in Class X SMA Negeri 1 Bantaeng.

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