

Implementation of the Problem Posing Model to Improve Learning Outcomes of Grade 5 Students on the Human Digestive System Material

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Abstract: The problem posing learning model is a method that can increase student activity and involvement in learning. The problem posing model encourages students to ask questions, solve problems, and discuss collaboratively, so that they are able to build a deeper understanding of the material being studied. This study aims to determine the influence and contribution of the problem posing model on the learning outcomes of the human digestive system material of grade 5 SDN Mandurian Hilir. The study conducted experiments related to the problem posing model with a quantitative approach with a quasi-experimental design. The stages of using the problem posing model are: the planning stage, the implementation stage and the reflection stage with 3 descriptive questions. The results of the study found that there was an influence of the use of the problem posing learning model on student learning outcomes in the human digestive system material with a significant value of 0.045. These results indicate that the problem posing model is effective in improving understanding of learning outcomes in the human digestive system material in grade 5.

Keywords: Human Digestive System, Learning Outcomes, Problem Posing

A. Introduction

Science is a science that studies the natural environment by studying nature in an organized way. Science is not just a skill in a series of knowledge, but also a process of discovery (Mardiyana et al., 2018). In studying science, it is assumed that by practicing various skills it will be possible to develop students' problem-solving abilities. Science process skills are scientific skills used to discover and develop a concept or theory and train students in increasing knowledge through scientific activities (Nurhudayah et al., 2017).

Science learning is often faced with a combination of abstract material and many scientific terms, making it difficult for students to understand the learning material. The material on the human digestive system is an example of material related to humans themselves. Judging from the object and nature of the material, the digestive

system in the body cannot be seen in real terms so that students generally have difficulty understanding, if they just listen to the teacher's explanation. Teachers need to organize and plan learning so that learning runs in line with what is desired (Fikri, 2020). The 21st century phase of the Industrial Revolution 4.0 has created a number of countries ready to improve various sectors, including in the education sector. In Indonesia, improvements in the education sector can be seen from changes in the curriculum for the better. The implementation of the 2013 Curriculum is a response from the Indonesian nation to face the challenges of the industrial revolution period of the twenty-first century. Problem-solving skills are one of the important components in education.

Students must have problem-solving skills, so that students can think critically. The problem of understanding skills can be seen from learning outcomes. If students hone their understanding, then students will be able to collect important information obtained, and find solutions. Learning outcomes are something that is obtained after the learning and teaching process occurs (Andryannisa et al., 2023). Student success can be seen through learning outcomes. Learning outcomes are the abilities that students have after receiving a learning experience (Fitriani, 2016). It can be concluded that learning outcomes are the feedback obtained during the learning process which is used by educators as a way to measure student understanding. Based on the results of interviews conducted with grade 5 teachers of SDN Mandurian Hilir regarding student learning outcomes, information was obtained that there were problems in the learning process. A score of 70 is the standard for the KKM score, where the lack of students' ability to complete the given practice questions causes some students to not meet the minimum completion criteria. This fact is in accordance with the low achievement of students' practice scores. Students tend to pay less attention when the teacher is explaining. This can happen because of the use of inappropriate learning models. One effort to design learning activities is to choose a learning model that is relevant to the subject matter. Choosing the right learning is important to influence students' creative thinking (Rosidi, 2019). There are many learning models available to improve problem-solving skills, including Problem Based Learning, Problem Solving, Discovery Learning, and Problem Posing. In this study, the model used is the problem posing model. Where Problem posing asks students to solve problems.

Problem posing was developed by Brazilian education expert Paulo Freire in his book *Pedagogy of the Oppressed*. Problem posing is an English term derived from two words, namely "problem" which means problem or issue and "posing" which means suggesting or forming (Rozy, 2012). The problem posing learning model is a learning model that requires students to formulate or solve a problem themselves into simpler questions that refer to solving the problem. The problem posing model has three stages, namely the planning stage, implementation stage, and observation stage. The steps are as follows (Sugiharti & Ningsih, 2021). Planning stage, activities to create a learning implementation plan (RPP) which includes KI, KD, learning

indicators, learning activity steps, and assessment rubrics. Implementation stage, learning activities are carried out using the problem posing model so that student learning outcomes experience better changes. Students are formed into groups to create questions, then ask students to present questions along with the answers that have been made. Observation stage, observing the learning process from beginning to end to evaluate what are the obstacles in implementing learning.

Some of the advantages of implementing the problem posing model, include: providing confirmation of the concepts received or enriching basic concepts through learning; training students to improve their learning abilities; and the orientation of learning is inquiry and discovery which is essentially problem solving (Wulannintyas, 2019). In addition to the advantages, the problem posing model also has disadvantages, namely: it cannot be used for lower classes; not all students are skilled at making questions; and it takes a relatively long time to learn to make questions well (Kushermawanti et al., 2018).

Previous research conducted by (Christidamayani & Kristanto, 2020) regarding the effect of the problem posing model on problem solving ability, the results of $P\text{-Value} = 0.0010 < \alpha = 0.05$, meaning H_0 is rejected and the conclusion is that the ability of students who utilize the problem posing model is superior to the conventional model. In addition, according to research (Daryati et al., 2019), the problem-solving ability of students using the problem posing method is higher than using conventional methods. Students must have problem-solving skills, so that students can think critically. The problem of understanding ability can be seen from student learning outcomes (U et al., 2023). If students hone their understanding, then students will be able to collect important information obtained, and take solutions. Previous studies have found that the use of the problem pose model can improve students' problem-solving abilities, improve students' understanding and critical thinking skills, but is more oriented towards quantitative results of measurements between learning methods. This study aims to combine the problem position method and integrate the analysis of the relationship between students' problem-solving abilities and understanding of the subject matter. In addition, this study also deepens the analysis of how students who use the problem pose model can develop critical thinking skills through the process of identifying important information, formulating problems, and formulating solutions independently.

B. Methods

This research is field research, which is going directly to the field. The approach used in this study is a quantitative approach with a quasi-experimental design with an intact-group comparison model, which is a comparison of one group divided into two parts. Population is a generalization area consisting of objects/subjects that have certain characteristics (Sugiyono, 2017). The population of this study was all students in grade 5 of SDN Mandurian Hilir, totaling 20 students. We chose the

upper class because it is easier to obtain information and is able to assess the actual situation. The upper class includes grades 4, 5, and 6. Based on interviews conducted with class teachers at SDN Mandurian Hilir, it was found that many students in grade 5 were still not skilled in answering questions or in other words they answered questions carelessly. This is the reason we chose grade 5 students of SDN Mandurian Hilir. The sampling method for this study used a saturated sampling technique, where samples were taken from the entire population of this study, namely all grade 5 students of SDN Mandurian Hilir, totaling 20 people. Saturated sampling is a sampling technique in which all members of the population are sampled (Sugiyono, 2017). The data of this study are the results of student learning on the material of the human digestive system, using the Problem Posing learning model to determine student learning outcomes. Data sources include primary and secondary data, primary data is a data source that provides data directly to data collectors while secondary data is a source that does not provide information directly to data collectors (Sugiyono, 2017).

Data collection techniques in the form of tests and non-tests. The test in this study determines student learning outcomes. The test technique is carried out in the form of a written test of 3 descriptive questions, the test used is the initial test (pre-test) and the final test (post-test) which aims to determine student learning outcomes both before and after treatment using the problem posing model. The non-test techniques used in this study are observation sheets, interviews and student response sheets. The data analysis technique used in this study is descriptive and inferential statistical analysis. The data collected in the form of pre-test and post-test results are then compared. Comparing the two scores, is there a difference between the pre-test and post-test scores.

C. Results and Discussion

The results of the pre-test and post-test of students at SDN Mandurian Hilir in the control class and experimental class, obtained the following calculation results.

Table 1. Pre-Test and Post-Test Results of Control Class

Student Name	Pre-Test	Post-Test
Kon-1	12	20
Kon-2	8	18
Kon-3	20	27
Kon-4	2	4
Kon-5	11	13
Kon-6	14	17
Kon-7	16	18
Kon-8	12	14
Kon-9	11	14
Kon-10	12	17

Table 2. Results of Pre-Test and Post-Test of Experimental Class

Student Name	Pre-Test	Post-Test
Eks-1	20	21
Eks-2	18	28
Eks-3	15	21
Eks-4	12	23
Eks-5	20	27
Eks-6	4	10
Eks-7	12	22
Eks-8	20	25
Eks-9	11	20
Eks-10	8	18

Table 3. Pre-Test and Post-Test Values Using Percentage

Control Class				Experimental Class			
Pre-test	%	Post-test	%	Pre-test	%	Post-test	%
12	40	20	67	20	67	21	70
8	27	18	60	18	60	28	93
20	67	27	90	15	50	21	70
2	7	4	13	12	40	23	77
11	37	13	43	20	67	27	90
14	47	17	57	4	13	10	33
16	53	18	60	12	40	22	73
12	40	14	47	20	67	25	83
11	37	14	47	11	37	20	67
12	40	17	57	8	27	18	60

Based on the calculation results above, the average results for the experimental and control classes are as follows:.

Table 4. Summary of Pre-Test Result Calculations

Category	Experimental Class	Control Class
Highest Score	20	20
Lowest Score	4	2
Mean	14.00	11.80
Standard Deviation	5.558	4.733

Table 5. Summary of Post-Test Result Calculations

Category	Experimental Class	Control Class
Highest Score	28	27
Lowest Score	10	4
Mean	21.50	16.20
Standard Deviation	5.104	5.846

Table 6. Validity Test Results

No	Pearson Correlation	Sig Value	Conclusion
Question 01	0,558	0,011	Valid
Question 02	0,415	0,069	Invalid
Question 03	0,729	<,001	Valid
Question 04	0,758	<,001	Valid
Question 05	0,352	0,127	Invalid
Question 06	0,323	0,165	Invalid

Table 7. Reliability Test

Cronbach's Alpha	N of Items
.741	3

Table 8. Normality Test

Class	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Pre-Test Class	0,233	10	0,133	0,934	10	0,492
Post-Test Class	0,192	10	0,200*	0,923	10	0,380
Pre-Test Experiment	0,164	10	0,200*	0,911	10	0,287
Post-Test Experiment	0,184	10	0,200*	0,915	10	0,314

Table 9. Homogeneity Test

	Levene				
	Statistic	df1	df2	Sig.	
Based on Mean	0,364	3	36	0,779	
Based on Median	0,350	3	36	0,790	
Based on Median and with adjusted df	0,350	3	32,853	0,790	
Based on trimmed mean	0,367	3	36	0,777	

Table 10. One Way ANOVA Test

	Learning outcomes				
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	140.450	1	140.450	4.664	0,045
Within Groups	542.100	18	30.117		
Total	682.550	19			

Table 11. Determination Coefficient Test

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.834 ^a	.696	.658	2.985

a. Predictors: (Constant), Problem Posing

There are three categories of R-square value grouping, namely strong category, moderate category and weak category (Nuryani & Winata, 2023). Below is a table of R-square criteria.

Table 12. R-Square Value Criteria

No	R Square Value	Criteria
1	>0,67	Strong
2	>0,33	Medium
3	>0,19	Weak

The time period given by the campus to conduct the research was 2 months, starting from February 1, 2024 to April 1, 2024. In this study, we acted as a teacher. Before the

learning was carried out, we carried out several preparations, namely making a learning implementation plan (RPP) and making question instruments that would be tested, as well as making an assessment rubric. The questions used were descriptive questions, the answers obtained were very diverse, different from one student to another.

This study uses a problem posing learning model, this learning model requires students to formulate and solve their own questions. The use of the problem posing learning model has a positive influence on student learning outcomes and activates students in learning. In line with previous research related to problem posing learning that has been carried out (Yuntawati, 2019) states that problem posing has a positive influence on learning. Problem posing provides students with the opportunity to explore information that is designed to teach students the process of thinking to solve problems.

As an initial step, we carried out several preparations, namely making a learning implementation plan (RPP) and making a question instrument that would be tested, as well as making an assessment rubric. The questions used were descriptive questions, the answers obtained were very diverse, different from one student to another. The assessment steps are as follows: reading the first question of all students to get an idea of whether the answers given by the students were complete or not; determining the score for the first question number; if the answer is perfect, it gets a score of 10, if less than 8, and so on (if the student answers all three questions correctly, they get 30 points); repeating this step for the second and third test questions; the last step is to add up the test scores of each student.

Before we conducted research for data collection, we validated the question instrument and learning device to an expert validator. These questions were first tested on students who studied at different schools and had studied material about the human digestive system. Furthermore, a validity test was carried out to determine whether the question instrument was valid. Based on decision making, namely: if the sig value < 0.05 then the question instrument is said to be VALID and if the sig value > 0.05 then the question instrument is said to be NOT VALID. Based on the results of the data calculation, 3 questions were declared valid and 3 questions were declared invalid. Furthermore, reliability testing, decision-making criteria, namely: if the Cronbach's Alpha value > 0.60 then the question is considered reliable and if the Cronbach's Alpha value < 0.60 then the question is considered unreliable. The results of the reliability test conducted by us obtained a value of 0.741 so that the value was declared reliable. The normality test aims to determine whether the data is normally distributed or not. Decision-making criteria, namely: if sig > 0.05 then the value is normally distributed and if sig < 0.05 then the value is not normally distributed. The results of the normality test of this study show the significance value seen in the Shapiro-Wilk column for the pre-test of the control class of 0.492, the post-test value for the control class of 0.380 so that it can be

concluded that the control class data is normally distributed. In the pre-test of the experimental class of 0.287, the post-test value for the experimental class of 0.314 so that it can be said that the experimental class data is normally distributed.

The homogeneity test aims to determine whether the pre-test and post-test data of the control and experimental classes show homogeneity or not. Decision-making criteria, namely: if $\text{sig} > 0.05$ then the value is homogeneously distributed and if $\text{sig} < 0.05$ then the value is not homogeneously distributed. The results of the homogeneity test of this study show that the significance value is seen from the based on mean, which is $0.779 > 0.05$ so that it can be concluded that the variance of the control and experimental classes is homogeneously distributed. Data that meets the requirements, namely normally distributed and homogeneous, then the difference test used is the one-way ANOVA test. The results of the one-way ANOVA test show that the significance value of 0.045 is smaller than 0.05. Thus, it can be concluded that the use of the problem posing learning model has an effect on the learning outcomes of grade 5 students of SDN Mandurian Hilir, Tapin Regency.

Referring to the results of the previous interview conducted by us together with the grade 5 teacher of SDN Mandurian Hilir. He said that, in answering questions, there were still many students who answered carelessly. This was proven when we conducted a pre-test, in fact, it was found that several students who answered not in accordance with the context, some filled in the answer with the word "flag". The existence of students who answered carelessly was because students tended to be lazy in reading the questions that had been presented.

After being given several treatments using the problem posing learning model, students who answered carelessly experienced changes for the better. This can also be seen on the student response sheets distributed by us when the last learning activity was on the human digestive system material. Each student in the experimental class was given a response sheet to learning using problem posing. Students gave a positive response to our statement, this shows that students are happy with problem posing learning on the human digestive system material, students find it easier to understand and remember learning materials, and students dare to ask questions to the teacher or to fellow friends.

From the post-test score data of the control class and the experimental class, tested with a one-way ANOVA test to see the effect of the problem posing learning model on student learning outcomes, the R Square value (determination coefficient) is also known to see the extent of the influence of the learning model. Looking at the Model Summary table through the calculation of the SPSS version 29 application, the R Square value (determination coefficient) is 0.696, which means that the effect of the problem posing learning model on learning outcomes is 69.6%. This means that 30.4% does not play a role in student learning outcomes.

The contribution contributed is influenced by several things, including a change in learning style towards the better in the sense that students who were originally stiff and seemed shy after being given treatment assisted by the problem posing learning model, students become more active. In addition, students do not hesitate to ask questions and express their opinions.

Meanwhile, 30.4% of the problem posing model did not contribute to student learning outcomes due to several reasons, namely: 1) a small number of students from grade 5 were busy preparing for the National Student Sports Olympiad (O2SN) so that these students came and went during learning. In addition, 2) lack of interest in reading questions in the form of stories, and 3) there were still students who were not fluent in reading and students who could not read at all (did not know the alphabet well) which caused difficulties in working on the questions given. This is in accordance with research (Oknaryana & Irfani, 2022) that discipline, namely time discipline (on time, not going in and out of class) and discipline of actions (following the rules, not being lazy) affect student learning outcomes. The results of the study (Murtiningsih, 2018) stated that reading interest affects learning outcomes, the higher the interest in reading, the higher the learning outcomes. Research (Windrawati et al., 2020) also states that students who are unable to read have difficulty in learning and understanding information contained in various textbooks.

Learning activities using this problem posing model allow students to find and apply their ideas both individually and in groups. Students have the opportunity to express their opinions in group discussions, consult or ask about mistakes made in preparing and working on questions, and practice responsibility for the tasks given. This is in accordance with research findings (Mayasari & Himmah, 2020) the results of the study showed that the application of the pre-solution posing type problem posing model is more effective in students' problem-solving abilities than students who receive conventional learning. Based on the research results, it can be concluded that the experimental class that uses the problem posing model has a significant influence on student learning outcomes compared to the control class that uses the conventional learning model.

D. Conclusions

Related to the presentation and discussion of the results of the research data above, it is known that the use of the problem posing model has an effect on student learning outcomes with a significance value of 0.045. This shows that the significance value is less than 0.05. Therefore, H₀ is rejected and H₁ is accepted. This means that the problem posing model has an effect on student learning outcomes in the science learning content of the human digestive system material in class 5 of SDN Mandurian Hilir, Tapin Regency. The contribution given by the problem posing model is 0.696, which means that the magnitude of the influence of the Problem Posing variable on student learning outcomes in the science learning content of the

human digestive system material in class 5 of SDN Mandurian Hilir, Tapin Regency is 69.6%.

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