JURNAL PENDIDIKAN INDONESIA
https://jurnal.seaninstitute.or.id/index.php/jupei

JU-PENDI
ISSN : 2963-2412
VOL 03. No. 01, 2024

The Influence of Problem Based Learning Model on Increasing Self-Esteem and Learning Outcomes of Students on Excretory System Material

[1]Nazila Nur Laila, [2]Tuti Kurniati, [3]Iwan Ridwan Yusup
[1,2,3]Program Studi Pendidikan MIPA, Fakultas Tarbiyah dan Keguruan, UIN Sunan Gunung Djati Bandung

ARTICLE INFO

Keywords:
PBL Learning Model,
Self-esteem,
Learning outcomes,
Learners,
Excretory System

ABSTRACT

This study aims to determine the effect of the Problem Based Learning (PBL) learning model on increasing Self-Esteem and student learning outcomes in the excretory system material. In this study, there are two types of variables used. First, the independent variable is the level of student self-esteem, and the dependent variable is the learning outcomes of students. The study was conducted at MTS Al-Misbah located at Jalan Desa Cipadung No.22, Cibiru District, Bandung City, West Java. The population in this study were all students of class VIII MTS Al-Misbah consisting of two classes, namely class VIII A and VIII B with a total of 73 students. The sampling method used was purposive sampling. The learning outcomes of students using the PBL model produced an N-gain of 0.7 with a high category. In addition, the results of self-esteem after using the PBL model got a high category, this proves that the learning model can affect the level of student self-esteem. The application of PBL in an effort to improve students' self-esteem is one solution where with this model students are more involved in the learning process so that it can improve students' self-esteem and learning outcomes. So, from the two hypothesis tests it can be concluded that there is an influence of the PBL learning model on improving students' Self-Esteem and learning outcomes in the excretory system material.

Email :
nazilanurlaila25@gmail.com
tuti.kurniati@uinsgd.ac.id
iwanyusup@uinsgd.ac.id

INTRODUCTION

Teaching and learning activities carried out in the classroom involve students and teachers. In the process, it is not uncommon for students to appear unprepared to receive the material, especially in science learning. Science learning seems to be a difficult subject because it is full of concepts and memorization (Sulthon, 2016). Learning is expected to change behavior, so meeting this expectation is difficult. In fact, the most important thing about learning is change, whether the change is basically cognitive and knowledge-based. Emotional quality is related to good attitudes and behavior, including the formation of good behavior related to awareness and responsibility in life. Therefore, learning that changes behavior and forms the personality and character of students as a whole, both in terms of knowledge as a result of education, attitudes and behavior as the influence of education, and life skills as part of educational activities requires a constant spirit in learning (Sulthon, 2016).

The success of the teaching and learning process in the classroom depends on several aspects, one of which is the teacher as an educator. Educators need to pay attention to the condition of students when teaching. Learning needs to be communicated, focused, and aroused the interest and motivation of students optimally so that learning objectives can be achieved. Based on the results of the interview on March 29, 2023 with the science subject teacher at MTS Al-Misbah, it was found

that the learning process in the classroom still uses a learning model with lecture methods and taking notes. The results of this learning are hampered, especially in the excretory system material, namely the lack of student understanding and the concept of the material that is memorized a lot, resulting in poor student learning outcomes in the excretory system material and a lack of self-confidence in students. This can be analyzed through student learning outcomes below the average minimum completion criteria determined by the school, reaching a score of 70 (Yusup, 2010).

The material on the human excretory system cannot be explained simply through notes, lectures, or reading books alone. (Yudasmasa, 2015). The use of the Problem Based Learning learning model is thought to have an important influence on increasing students' thinking skills so that they can improve learning outcomes. (Widjajanti, 2011). With this learning model, educators can find out students' abilities including their learning activities because currently learning and teaching activities are carried out face-to-face. This is where the role of self-esteem can be seen. Science learning is thought to be a fun lesson for students.

Some students who have high self-esteem feel confident and sure when learning. However, not a few students have low self-esteem when faced with science lessons. (Maharani, 2019). The level of self-esteem of students can affect their learning outcomes. Learning outcomes are a crucial element in the education process. According to Sudjana (2009), quoted by Samsir (2015), student learning achievements actually include behavioral changes involving cognitive, affective, and psychomotor aspects as learning outcomes in a broader sense. Based on the background that has been presented, a study will be conducted with the title"The Influence of Problem Based Learning Model on Increasing Self Esteem and Learning Outcomes of Students on Excretory System Material"

METHOD

This study uses a quantitative approach because it is related to numbers and in data management is done statistically, measurably and controlled. First, the independent variable is the level of self-esteem of students, and the dependent variable is the learning outcomes of students. The study was conducted in the odd semester of the 2022/2023 academic year directly with face-to-face meetings. Taking place in May 2023. The study was conducted at MTS Al-Misbah which is located at Jalan Desa Cipadung No.22, Cipadung, Cibiru District, Bandung City, West Java. The population in this study were all students of class VIII MTS Al-Misbah consisting of two classes, namely class VIII A and VIII B with a total of 73 students. The sampling method used was purposive sampling. Purposive sampling is a method of determining samples from a population based on certain criteria based on the researcher's considerations (Mukhsin, 2017).

This study uses two types of data, namely primary data and secondary data. First, primary data as the main source of information collected directly from the source. Second, secondary data is data used in this study derived from all sources that already exist at the research location. The data sources in this study are science teachers and students of MTS Al-Misbah, Bandung City. Then, this data source becomes the basis for the instruments used in this study.

Data collection in this study was carried out through test and non-test methods. The test method includes the application of pre-test and post-test. Namely using Observation, Test, and Questionnaire. The procedure carried out in this study consists of three stages. The first stage is preparation starting with identifying problems, compiling learning devices and research instruments, and validating research instruments such as lesson plans, student worksheets, questions, observation sheets, and questionnaires). Second, the research implementation stage and the third stage is the final stage by starting from data analysis to drawing conclusions. The instruments used were first tested with the aim of ensuring the quality of the questions. Calibration and calibration tests used the anates program version 4.0, namely Validity Test, Reliability Test, Difficulty Level Test, and Discriminatory Power Test.

This study uses descriptive analysis to describe or provide an overview of the object being studied. The method used in data analysis is using the SPSS (Statistical Package for Social Science) program, here is the analysis; Analysis of the Implementation of the Learning Process, Analysis of the Effect of the Problem Based Learning Model on Student Learning Outcomes (Normality Test, Homogeneity Test, Hypothesis Test), and Analysis of the Level of Student Self-esteem.

RESULTS AND DISCUSSION

Implementation of Problem Based Learning Model on Excretory System Material

The implementation of the Problem Based Learning model can be known through the implementation of observations carried out by subject teachers as observers. This observation process involves the use of observation sheets in each meeting. The aim is to observe the implementation of teacher and student activities running well. The results of data analysis from teacher and student observation sheets as a whole can be found in Table 4.1 below.

Table 4.1 Implementation of Teacher Activities

Observation	Activity Implementation			Information
	Meeting 1	Meeting 2	Meeting 3	
Percentage	100%	100%	100%	Very well executed
Average		100%		

Based on table 4.1, it can be seen that the Problem Based Learning model has been implemented with the percentage of teacher activity implementation reaching 100% and learning is categorized as being implemented very well.

Table 4.2 Implementation of Student Activities

Observation	**Activity Implementation**			**Information**
	Meeting 1	**Meeting 2**	**Meeting 3**	
Student orientation towards problems	100%	100%	100%	Very good
Organizing students to learn	100%	100%	100%	Very good
Guiding individual and group investigations	100%	100%	100%	Very good
Developing and presenting work results	100%	100%	100%	Very good
Analyze and evaluate the problem solving process	100%	100%	100%	Very good
Percentage	**100%**	**100%**	**100%**	**Very well**
Average		**100%**		**executed**

Similar to teacher activities, the percentage of student activity implementation based on table 4.2 reached 100% and learning the excretion system using the Problem Based Learning model was categorized as being implemented very well.

Student Learning Outcomes with and without Using the Problem Based Learning Model on the Excretory System Material

This study aims to examine the cognitive learning outcomes of students with a focus on achieving the minimum completion criteria (KKM) value which has been set at 70. The following is an explanation;

Table 4.3 Percentage of Values in Classes with Problem Based Learning Models based on KKM

KKM Value	∑Students < KKM Value	Percentage	∑Students > KKM Value	Percentage
70	3	8.1%	34	91.8%

Based on table 4.3, it can be seen that the number of students who get scores above the KKM is 34 students out of a total of 37 students with a percentage of 91.8%. Meanwhile, students who get scores below the KKM consist of 3 students with a percentage of 8.1%. This can be categorized that the learning outcomes of students in classes using the Problem Based Learning model have a positive influence. While the percentage of student learning outcomes without using the Problem Based Learning model based on the KKM can be seen in table 4.4 below.

Table 4.4 Percentage of Values in Classes without Using the Problem Based Learning Model based on KKM

KKM Value	∑Students < KKM Value	Percentage	∑Students > KKM Value	Percentage
70	5	13.8%	31	86.1%

Based on table 4.4, the percentage of grades in classes without using the Problem Based Learning model also has a positive influence. This is because the number of students who have grades above the KKM is greater than the number of students who have grades below the KKM. The criteria for learning outcomes in classes with and without using the Problem Based Learning model can be seen in tables 4.5 and 4.6 below.

Table 4.5 Criteria for Learning Outcomes in Classes with the Problem Based Learning Model

Final score	Criteria	Amount
80-100	Very good	26
70-79	Good	8
60-69	Not good	3

Table 4.6 Learning Outcome Criteria in Classes Without Problem Based Learning Models

Final score	Criteria	Amount
80-100	Very good	18
70-79	Good	13
60-69	Not good	5

Based on table 4.5, it can be seen that there are 34 students who have the ability to effectively receive and follow the learning process using the Problem Based Learning learning model. As for table 4.6, there is data on the criteria for learning outcomes in classes without using the Problem Based Learning model. Based on table 4.6, it can be seen that in classes without using the Problem Based Learning model, they also have the ability to effectively receive and follow each learning process. This can be seen from the number of students who have very good and good criteria, totaling 31 students. From the results of the Pre-test and Post-test learning classes using the learning model, it can be observed that the C3 indicator has increased with an N-Gain value of 0.70, a high criterion. Meanwhile, indicators C2, C4, and C5 also increased, but with a moderate category with N-Gains of 0.64, 0.65, and 0.68 respectively.

Self-esteem Level of Students Using Problem Based Learning Model on Excretory System Material

The research that has been conducted involves a self-esteem questionnaire of students at MTS Al-Misbah, aimed at observing the level of self-esteem of students. The results of the test are as follows:

Table 4.7. Results of Descriptive Analysis of Students' Self-esteem Before and After Using the Learning Model

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
before using the model	37	28	42	36.32	3.110
after using the model	37	50	59	55.11	1,897

Valid N (listwise)	37

Based on table 4.7. the results of descriptive analysis of Self-esteem of Students using SPSS 26 can be seen the minimum, maximum, average, and standard deviation values. Before using the learning model, it can be seen that the minimum value is 28, the maximum is 42, the average value (mean) is 36.32 with a standard deviation of 3.110. After using the learning model, it can be seen that the minimum value is 50, the maximum value is 59, the average value (mean) is 55.11 with a standard deviation of 1.897. The following is after further study:

Table 4.8. Results of Students' Self Esteem Before Using Learning Models Based on Aspects and Indicators

No	Aspect	Indicator	No Self-esteem Statement	Percentage	Total Percentage
1	Strength	Able to control one's own personality which has an impact on others	4	48.65%	47.97%
			11	45.95%	
			14	50.81%	
			15	46.49%	
2	Courage	Showing concern for others	1	45.95%	44.19%
			2	40.00%	
			3	41.62%	
			9	49.19%	
3	Policy	Comply with applicable regulations	12	55.14%	51.35%
			13	49.19%	
			10	49.73%	
4	Ability	Able to face his own problems	5	51.35%	50.95%
			6	41.62%	
			7	52.43%	
			8	58.38%	

Based on table 4.8, the results of students' self-esteem before using the learning model, seen from the aspects and indicators, can be seen in the strength aspect getting a percentage of 47.97%, the meaningfulness aspect of 44.19%, the policy aspect of 51.35%, and the ability aspect of 50.95%. Thus, the aspect that gets the highest percentage is the policy aspect with the indicator being able to comply with applicable regulations. While the aspect with the lowest percentage results is the courage aspect with the indicator showing concern for others with a percentage of 44.19%. The categories of students' self-esteem results before using the learning model can be seen based on table 4.9 below:

Table 4.9. Results of Students' Self Esteem Categories Before Using Learning Models

Parameter	Score	Category
Mean	37.1	Low
Median	37.0	Low
Mode	36.0	Low

Based on table 4.9. the results of the self-esteem questionnaire of students before using the learning model, it can be seen that the average questionnaire score is 37.1 with a low category. The median of 37 and the mode of 36 are both also included in the low category. The following is a visualization of the results of the self-esteem of students before using the learning model:

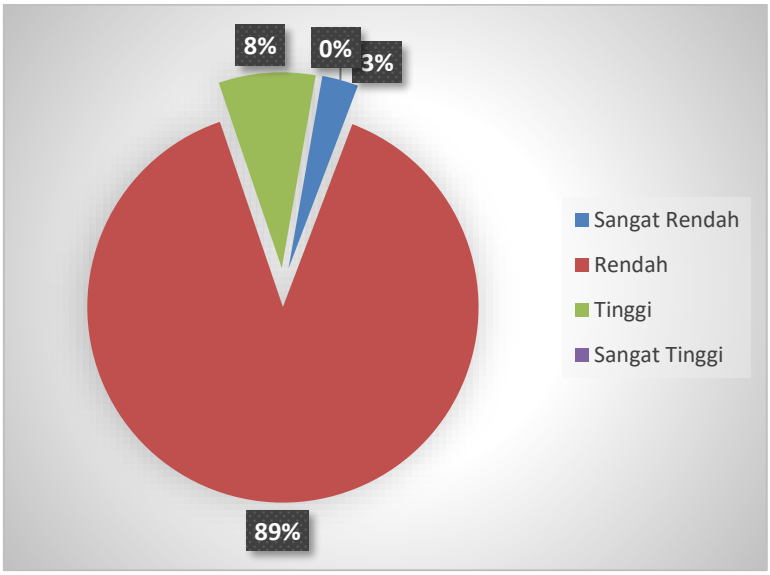

Figure 4.1 Percentage of Students' Self Esteem Results before Using the Learning Model

Based on the diagram above, it can be seen that 89% of students are in the low category, 8% of students are in the high category, 3% of students are in the very low category, and 0% of students are in the very high category. The results of the student self-esteem questionnaire after using the Problem Based Learning learning model based on its aspects and indicators are as follows:

Table 4.10. Results of Students' Self-esteem after Using the Problem Based Learning Model based on Aspects and Indicators

No	Aspect	Indicator	No Self-esteem Statement	Percentage	Total Percentage
1	Strength	Able to control one's own personality which has an impact on others	4	75.13%	71.48%
			11	71.35%	
			14	67.56%	
			15	71.89%	
2	Courage	Showing concern for others	1	74.59%	73.64%
			2	67.56%	
			3	78.37%	
			9	74.05%	
3	Policy	Comply with applicable regulations	12	70.81%	73.33%
			13	76.21%	
			10	72.97%	
4	Ability	Able to face his own problems	5	78.37%	75.67%
			6	79.45%	
			7	70.81%	
			8	74.05%	

Based on table 4.10, the results of students' self-esteem after using the problem based learning model based on aspects and indicators can be seen that the highest percentage of 75.67% is in the aspect of ability with the indicator of being able to face their own problems. The following is a picture of the percentage of students' self-esteem after using the Problem Based Learning model:

JU-PENDI
ISSN : 2963-2412
VOL 03. No. 01, 2024

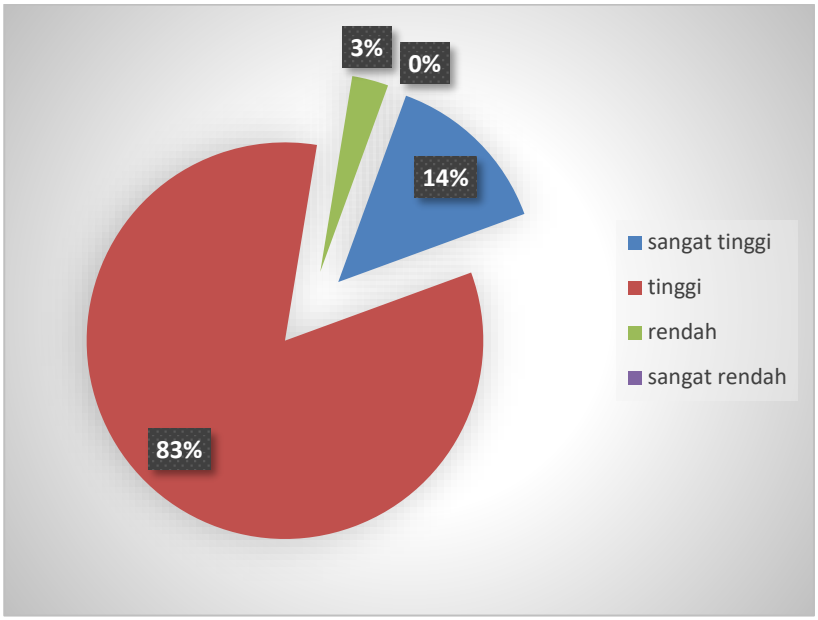

Figure 4.2 Percentage of Student Self Esteem after Using the Problem Based Learning Model

Based on the diagram above, it can be seen that the highest percentage of students is 83% in the high category, 14% in the very high category, 3% in the low category, and 0% of students in the very low category.

Discussion of Research Results

Implementation of Problem Based Learning Model on Excretory System Material

In this study, the implementation of the Problem Based Learning model was observed through interactions between teachers and students during the learning process, by following the steps contained in the Problem Based Learning model:

a. Implementation of Teacher Activities

The results of the analysis of the observation sheet related to the implementation of teacher activities at the three meetings showed a percentage of 100% with very good criteria. This value indicates that the entire learning process that has been carried out has been carried out well. The learning process with a problem-based learning model which emphasizes learning with problem-solving activities includes initial activities such as opening learning, providing motivation, apperception, and conveying learning objectives. (Yulianti, 2019). At the first meeting during the initial activities, the teacher gave pre-test and self-esteem questions to students to be worked on according to their abilities and conditions. At this stage, not a few students complained about not working on the pre-test questions because they did not understand the excretory system material. The pre-test was given before the learning took place with the aim of finding out the extent of students' understanding of the material to be delivered (Magdalena, 2021).

The learning process at the core activity stage begins with the orientation of students to the problem, where the teacher provides stimulus in the form of videos and questions to students regarding the excretory system material. Students are given stimulus so that awareness arises about the problems that need to be solved (Syamsidah, 2018). There are obstacles at this stage where students dare to convey answers to questions simultaneously. Students seem less confident with their answers if they have to answer questions individually. (Ramli, 2021). Furthermore, the obstacles that occur at the stage of organizing students to learn where students are confused about choosing friends to be the leader, notary, and spokesperson for

each heterogeneous group so that the teacher helps students to discuss and express their opinions to each other. The main factor that makes it difficult to express this opinion is the feeling of anxiety and trembling as well as the fear of being wrong in the learning process (Cahyono, 2022). In the learning process, there is an interaction between the teacher and students. The teacher does not only act as a teacher, but also as an educator who has the aim of activating students in the learning process. To achieve success in learning, teachers need to implement strategies that enable the learning objectives that have been designed to be achieved (Zural, 2018). Although it has reached a percentage of 100% in the implementation of teacher activities, it is necessary to optimize the learning process by improving it through evaluation in order to provide an ideal environment for students to carry out the learning process. (Idrus, 2019).

b. Implementation of Student Activities

The results of the implementation of student activities on the excretory system material using the Problem Based Learning model are greatly influenced by the role of the teacher. In order for students to be motivated and active in the learning process, the teacher must play a role as an effective facilitator and motivator. Therefore, the teacher first conveys the objectives of implementing learning by applying the problem based learning model and the activities that will be carried out by students until the objectives in learning are achieved (Syamsidah, 2018). The results of the analysis of the implementation of student activities from the first to the last meeting obtained a percentage of 100% with very good criteria. This proves that students carry out the stages of the learning process using the Problem Based Learning model very well, the process begins with the problem orientation stage, organizing into groups, conducting individual and group investigations, developing and presenting work results, and analyzing and evaluating the problem-solving process in groups (Ardianti, 2021). There were obstacles in the implementation of the first meeting of learning where one of the students did not want to take part in group learning because he felt insecure and unable to communicate in groups with his friends. This is a challenge for teachers to be able to provide motivation and trust so that students have good self-esteem.

Student Learning Outcomes with and without Using the Problem Based Learning Model on the Excretory System Material

a. Learning Outcomes in Classes Using the Problem Based Learning Model

Learning outcomes in classes using the problem-based learning model can be seen in table 4.3, the percentage of scores in classes with the problem-based learning model with a KKM score limit of 70, there were 3 students who did not reach the KKM with a percentage of 8.1%. This happened because the three students did not follow the learning with focus because activities with the problem-based learning model required group learning activities and these students were not used to group activities. This is in line with the opinion of Fridaram, et al (2020) who explained that when students are able to focus fully and ignore external distractions, students will find it easier to understand the material or lessons being studied. However, if students cannot concentrate and are distracted by other things, students will have difficulty understanding the lesson.

Based on table 4.5, the criteria for learning outcomes in the class using the problem-based learning model received very good criteria with a total of 26 students, 8 students who were included in the good criteria, and 3 students who were included in the less good criteria. This means that there were 91.8% of students who got scores above the KKM with a total of 34 students. This proves that the problem-based learning model affects student learning outcomes because the learning process requires students to actively participate in learning activities and is not centered on the teacher (Listantiningtyas, 2021).

The average pre-test, post-test, and N-Gain scores in the class can be seen from the comparison of the smallest score in the pre-test which is 15 and the post-test 65. From here it can be seen the increase in scores in this class. The largest score in the pre-test is 60 and the post-test can reach a score of 100. Thus, the average pre-test score is 40 and the post-test 82, N-Gain 0.7 and it can be seen that the class that uses the problem-based learning model gets high criteria. This proves that the problem-based learning model affects student learning outcomes in the excretory system material (Listantiningtyas, 2021).

b. Learning Outcomes in Classes Without Using the Problem Based Learning Model
Learning outcomes in classes without using the problem based learning model are different from classes that use the problem based learning model. (Lukitasari, 2019). Learning outcomes in classes without using the problem based learning model based on table 4.4, the percentage of values in classes without using the problem based learning model has a positive influence with a percentage of 13.8%, namely 5 students who get scores below the KKM. The KKM value is 70. As for students with scores above the KKM with a percentage of 86.1%, namely 31 students. The learning outcomes of students with this model are not as good as using the problem based learning model, although the implementation of this model can be easier in learning by focusing on completing assignments, Trianto (2007) noted that this model tends to make students passive because it does not focus on students and is less motivated in learning. Based on table 4.6, the learning outcome criteria in the class without using the problem based learning model, there are 18 people who are included in the very good category, 13 people who are included in the good criteria, meaning that there are 31 students who have good and effective abilities in the process of receiving and following the entire series of learning. While there are 5 students who are included in the less good criteria.

Self-esteem Level of Students Using Problem Based Learning Model on Excretory System Material

The implementation of teacher and student activities based on the observation sheet was categorized as very well implemented. However, in the learning process there were several obstacles that affected students' self-esteem. Based on table 4.9. the results of students' self-esteem before using the learning model were included in the low category. Given the excretory system material which contains abstract concepts, it can make students have difficulty in solving problems. So the role of teachers is very important in efforts to improve students' self-esteem (Alifiani, 2019). Research at the first meeting in its implementation related to self-esteem, there was an aspect of self-esteem with the lowest percentage based on table 4.10, namely the aspect of courage with indicators showing concern for others. The things that are considered in this aspect are feeling warmth from others, feeling support from others, feeling accepted by others, and feeling recognition and respect from others (Arifin, 2014). In its implementation, what happened when learning with group formation, there were several students with low self-esteem who looked quiet and less enthusiastic in expressing their opinions so that they only followed the group flow. Based on the results of student self-esteem after using the problem based learning model, it has a high category, which can also be seen in Figure 4.2. Based on the percentage, it is known that 83% of students are in the high category, 14% are in the very high category, 3% are in the low category, and 0% of students are in the very low category. The difference in student results is due to two factors, namely internal factors and external factors from each student. The results of self-esteem after using the learning model got a high category, this proves that the learning model can affect the level of student self-esteem. The application of Problem Based Learning in an effort to increase student self-esteem is one solution where with this model students are more involved in the learning process so that they can increase their sense of self-esteem (Syuhada, 2022).

CONCLUSION

Based on the results of research and discussion regarding learning using the Problem Based Learning model to improve self-esteem and student learning outcomes on the excretory system material, the following conclusions can be drawn: The implementation of teacher and student activities using the Problem Based Learning model received a very good category with an average value of 100. Analysis of student learning outcomes using the problem based learning model in the cognitive domain produced an average pretest score of 40, posttest 82, and N-gain of 0.7 in the high category. While in classes without using the problem based learning model, the average cognitive domain score was 34 pretest and 78 posttest with an N-gain of 0.6 in the low category. Analysis of the results of students' self-esteem in classes using the problem-based learning model before being given the action produced self-esteem results in the low category with a mean of 37.1, median 37, and mode 36. However, after being given action using the problem-based learning model in learning, the results of students' self-esteem increased to the high category with a mean score of 55.67, median 55, and mode 55.

REFERENCE

Aman, Kamisa. (2016). Penerapan Model Problem Based Learning dalam Pembelajaran Sejarah untuk meningkatkan Motivasi dan Prestasi Belajar Siswa. Jurnal Pendidikan dan Sejarah, 12(1), Hal 28-46.

Cahyono., Dadang Mulyana., Lili Sukarliana., Desi. (2022). Analisis Implementasi Model Pembelajaran Problem Based Learning dalam Menumbuhkan Keterampilan Mengemukakan Pendapat pada Proses Pembelajaran. Jurnal Ilmiah Mimbar Demokrasi, 21(2) Hal 87-92.

Darma, Budi. (2021). Statistika Penelitian Menggunakan SPSS. Jakarta: Guepedia

Fitria, Khoirin Nida., Dwijanto., Nuriana. (2023). Kemampuan Berpikir Kreatif Matematis ditinjau dari Self-esteem pada Model PBL dengan Pendekatan STEAM. Jambura Journal of Mathematics Education 4(2), Hal 110-118.

Fural, Mimin Mardhiah., dan Rahmayudi Febrinaldi. (2018). Pengaruh Penerapan Model Pembelajaran Problem Based Learning terhadap Aktifitas Siswa. BioCONCETTA: Jurnal Biologi dan Pendidikan Biologi, 4(1), 19-30.

Haka, Nukhbatul. (2021). Pengaruh Model Problem Based Learning dengan Metode Scaffolding terhadap Kemampuan Pemecahan Masalah dan Self Directed Learning Peserta Didik Biologi. Journal RCI Publisher. 1(1), Hal 388-406.

Kurniawan, Stefani Septi. (2014). Penerapan Pembelajaran Berbasis Masalah (PBM) Dengan Pendekatan Jelajah Alam Sekitar (JAS) Untuk Meningkatkan Kemampuan Berpikir Kritis Dan Hasil Belajar Peserta Didik Kelas VII Smp Xaverius 3 Bandar Lampung pada Materi Interaksi Makhluk Hidup Dengan Lingkungannya. Skripsi. Yogyakarta: USD.

Listantiningtyas, Dyah Ayu., Ramlawati., Harisah Alim. (2021). Upaya Meningkatkan Aktivitas dan Hasil Belajar Siswa melalui Model Problem Based Learning di SMP Islam Sudirman Juwangi. Profesi Pendidikan 2(2), Hal 207-216.

Magdalena, Ina., Miftah Nurul., Gestiana Ragin. (2021). Analisis Teknik Pre-Test dan Post-Test pada Mata Pelajaran Matematika dalam Keberhasilan Evaluasi Pembelajaran. Jurnal Pendidikan dan Ilmu Sosial, 3(2), Hal 150-165.

Putri, Ni Nym. (2020). Model Pembelajaran Self Regulated Learning Berbantuan Media Audio Visual terhadap Kompetensi Pengetahuan IPA. Mimbar PGSD UNDIKSHA, 8(2) Hal 202-213.

Ramli. (2021). Microteaching. Mataram: Sanabil.

Rezkillah, Inang Irma dan Haryanto. (2020). Pengaruh Model Pembelajaran Problem Based Learning Terintegrasi High Order Thinking Skill Terhadap Kemampuan Berpikir Kritis dan

Sikap Percaya Diri. Jurnal Pendidikan Sains Indonesia (Indonesian Journal of Science Education), 8(2), Hal 257-268.

Saifullah. (2018). Statistik Terapan untuk Penelitian Pendidikan. Jakarta: Kencana Prenada Media Group.

Yulianti, Eka., Indra Gunawan. (2019). Model Pembelajaran Problem Based Learning (PBL): Efeknya Terhadap Pemahaman Konsep dan Berfikir Kritis. Indonesian Journal of Science and Mathematics Education, 2(3), Hal 399-408.