



# Proceeding SYMBION (Symposium on Biology Education)

<http://seminar.uad.ac.id/index.php/symbion>

2540-752X (print) | 2528-5726 (online)



Symbion

## Students' Response to Problem Based Learning Model on Motion System Material

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### ARTICLE INFO

#### Article history

Submission Dec 12<sup>th</sup>, 2022

Revision May 10<sup>th</sup>, 2023

Accepted May 17<sup>th</sup>, 2023

#### Keywords

Learner Response

Problem Based Learning

Learning Model

### ABSTRACT

Problem Based Learning (PBL) or problem-based learning model is a learning model that focuses on authentic problems in the learning process. This method is widely used in problem solving, development of thinking skills, and self-regulation. This study aimed to describe the problem-based learning process and students' responses on the material of the motion system for class XI students of SMAN 1 Prambanan in the 2022/2023 academic year. This research was conducted using descriptive qualitative method where the research data collection was conducted using *Google Form* with guttman scale questionnaire type. The population used was a saturated population with all students in grades XI MIPA 1,2, and 3 with a total of 100 samples. The results of questionnaire data collection on each aspect of learning; aspects of problem-based learning implementation with a percentage of yes answers of 95.75%, aspects of students' attitudes towards the learning process with a percentage of yes answers of 97.28%, on the aspect of students' understanding of problem-based material with a percentage of yes answers of 96.66%, and aspects of students' interest in participating in further problem-based learning with a percentage of yes answers of 97%. The results obtained in all aspects show that the majority of students have a good response to the problem-based learning model or *Problem Based Learning*. This means that *Problem-based learning* can run and is said to be feasible to provide students' understanding.

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## Introduction

Strategies in the form of planning, implementation, assessment, and supervision are needed to improve the efficiency and effectiveness of learning and increase the potential creativity of students so that the main objectives of learning can be achieved <sup>1</sup>. The five main

components that need to be included in the learning process are objectives, media, materials, methods accompanied by models, and learning assessments. One of the main parts in the form of a learning model serves to invite students to learn actively both physically and mentally<sup>2</sup>. Basically, the learning model acts as a conceptual framework to describe systematic procedures for planning the learning process so that students can teach the material appropriately. In line with the development of learning that is needed to meet the needs of the 21st century, which includes 4C skills or *Collaboration, Communication, Creativity and innovation, Critical thinking and Problem Solving*<sup>3</sup>.

The hallmark of 21st century learning is that students are required to have problem-solving skills and the application of the 2013 curriculum concept will have a huge influence on the next generation in facing the challenges of the 21st century. 21st century learning is also known as the *industrial age* and the *knowledge age*, which requires skill proficiency efforts to get through habituation and meet life needs based on knowledge<sup>4</sup>. One of the applications of 21st century learning is by using a problem-based learning model, where problems act as a stimulus that activates student learning activities and helps the process of student understanding of existing material<sup>5</sup>.

*Problem-based learning* is a cooperative learning model that stimulates student activeness and encourages students to support and help each other master the material<sup>6</sup>. Problem Based Learning (PBL) or problem-based learning model is a learning model that is utilized in problem solving, thinking skills development, and self-regulation where authentic problems are the focus of learning. Fristadi & Bharata revealed that the starting point of PBL begins with the existence of problems that encourage students to analyze and find alternative solutions<sup>7</sup>. In learning with the PBL method, the role of students is the main player while the teacher acts as a facilitator. PBL is considered to be an effective strategy to improve critical thinking capabilities in students. There are 5 PBL syntaxes, including (1) students' view of the problem; (2) organizing students to learn; (3) assisting the process of independent and group investigation; (4) developing and presenting work; and (5) analyzing and evaluating the results of problem solving. *Problem-based learning* is not only aimed at learning concepts related to problems, but also aimed at learning scientific methods to solve problems and develop critical thinking patterns and mastery of learning materials<sup>8</sup>.

The main problems studied in *Problem-based learning* are problems in everyday life but still lack solutions. This indicates that there is a need for essential and strategic problem concepts to help students solve problems<sup>9</sup>. The concept of problems in life includes several aspects, namely: 1) Living things and life processes; 2) Substances / materials / objects and their properties; 3) Energy and its transition; 4) Earth and the universe. This concept is a basic concept that must be mastered by students as an illustration of internal problems in students. Learners will later solve problems independently and the teacher only acts as a facilitator.

Based on the description above, it is necessary to implement a new effort in improving the quality of learning in which the use of problem-based learning models is one of the steps that is in line with the applicable curriculum to see the problem-solving ability of students. Learners' capabilities can be seen from their responses during the learning process. Response is a behavior that can be influenced due to encouragement from the environment. Learner response is the behavior or action of learners during the learning process. Responses can arise when involving the five senses in studying and looking at an object of observation. Response can be influenced by several factors itself, namely derived from the learning process, expertise and personality values. So it can be concluded that a response is an action or behavior after observing learning through the five senses so that it creates a positive attitude or it could be a negative attitude<sup>10</sup>. Therefore, it is necessary to examine the responses of students in classes

XI MIPA 1, 2, and 3 SMA Negeri 1 Prambanan to find out more about the course of learning with the *Problem-based learning* model

## Method

This research is classified as descriptive qualitative research with the aim of knowing the students' response to the problem-based learning model in class XI MIPA 1, XI MIPA 2, and XI MIPA 3 at SMA Negeri 1 Prambanan Yogyakarta. Research data collection is presented in *Google Form* which uses a questionnaire with a guttman scale on two answer options including yes and no <sup>11</sup>.

The research was conducted at SMA Negeri 1 Prambanan in August 2022 during PLP II activities of FKIP UAD Yogyakarta students. The population used was a saturated population with all students in class XI MIPA 1, XI MIPA 2, XI MIPA 3 with a total of 100 students as samples. This study aims to determine the students' response to problem-based learning or commonly referred to as the *Problem-based Learning* model of human movement system material.

The Guttman scale is used with two options which include yes and no. The selection of the answer "yes" will give a score of 1 while the selection of the answer "no" will give a score of 0. Thus the calculation for the interval with the interpretation number is obtained namely:

$$K = \frac{F}{I} \times 100\%$$

Information :

K = Percentage of Feasibility

F = Number of "Yes" answers from respondents

I = Number of questions per aspect in the questionnaire

After the analysis, there is a comparison of the eligibility criteria based on the percentage range of students' responses as follows:

Table 1. Criteria for Questionnaire Response Percentage

Percentage	Criteria
0% - 20%	Very Less
20% - 40%	Less
41% - 60%	Simply
61% - 80%	Good/Feasible
81% - 100%	Very good/very decent

The learning material is given to XI MIPA class students with material on the Human Movement System. The instrument used is a Google form to get a valid Learner Response. The response questionnaire on Google forms consists of 4 aspects, namely aspects of the implementation of problem-based learning, aspects of students' attitudes towards the learning process, aspects of students' understanding of problem-based learning material, and aspects of students' interest in participating in further problem-based learning. This study aims to determine the response of

students to the implementation of the *problem based learning* model.

## Results and Discussion

From the research that has been conducted at SMAN 1 Prambanan, the results obtained are related to the questionnaire of students' responses to the implementation of problem-based learning models for the subject of Human Movement System of Class XI MIPA which is then analyzed by calculating the percentage level (%) of students' responses.

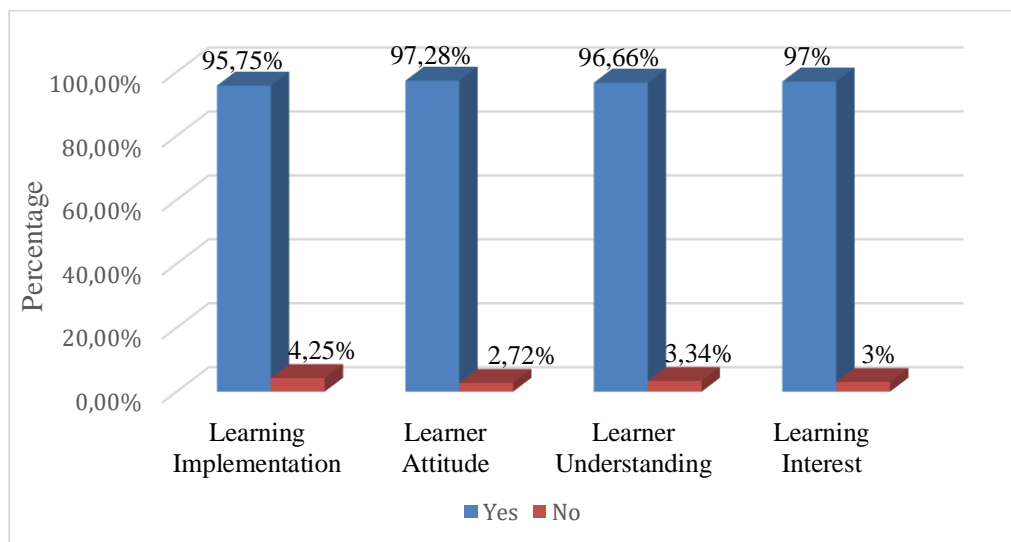


Figure 1. Percentage Diagram of Learner Response

### 1 Implementation aspect of problem-based learning

In this aspect, there are several statements addressed: (1) overall, the teacher's method of delivering motion system material is a new method, (2) the learning carried out by the teacher makes students able to discuss with a group of friends, (3) the learning carried out is fun / not, and (4) the case presented, can require students to be able to think critically. Based on the statements given, the results obtained on the aspect of implementing problem-based learning are the total response of students who choose the answer Yes as many as 383 responses with a percentage of 95.75%, where the percentage is said that the implementation of problem-based learning is said to be very feasible. A feasible way of teaching a teacher is a way that is able to focus the attention of students to be able to focus on problem solving.

### 2 Aspects of learners' attitude towards the learning process

In this aspect, there are several statements addressed: (1) the teacher guides students to focus on the problem presented, (2) the teacher guides students to investigate a problem, (3) students investigate a problem with the help of other literature such as the internet (except wikipedia, brainly, and blogspot), (4) students present the results of discussions regarding the causes and solutions of the problems presented, (5) the problems presented in learning, bring up various new ideas or ideas related to the problem, (6) the problems presented in learning make me more confident in expressing my opinion, and (6) the problems presented in learning make me more confident in expressing my opinion. (7) after participating in problem-based learning, I can present my work in the form of a poster. From the statements given, the results obtained in the aspect of students' attitudes, namely the response of students who chose the answer Yes as many as 681 responses with a percentage of 97.28%, the implementation of the problem-based learning model was said to be very good / very feasible. This is in line with the

Astalini's opinion that a positive attitude in students can be integrated from the social attitudes shown. The attitude shown will foster a spirit of independence in the learning group.

### 3 Aspects of learners' understanding of problem-based learning materials

In this aspect, several statements are addressed, namely: (1) after participating in learning, students can formulate problems in learning, (2) after participating in learning, students can determine solutions to the disturbance cases presented, and (3) after participating in learning, students can describe disturbances in the human motion system. The results in the questionnaire show 290 students chose the answer Yes with a percentage of 96.66% which means that the implementation of the problem-based learning model is said to be very good / very feasible. With the application of problem-based learning methods, students will have higher capabilities in critical thinking and better understand the material compared to conventional learning.

### 4 Aspects of learners' interest in participating in further problem-based learning

In this aspect, the statements addressed are (1) students are interested in teaching methods where the teacher conveys problems at the beginning of learning and (2) the teacher assigns students to solve problems so that students are determined to continue learning. The questionnaire results show 194 learners chose the answer Yes with a percentage of 97%, which means that the implementation of the problem-based learning model is said to be very good / very feasible. The greater the interest of students in a particular subject can be seen from the attention of students who tend to be greater in that subject.

## Conclusion

Based on the explanation of the results above, it can be concluded that the implementation of the problem-based learning model of motion system material in the aspect of implementing problem-based learning achieved a percentage of 95.75%, in the aspect of students' attitudes towards the learning process achieved a percentage of 97.28%, in the aspect of students' understanding of problem-based material achieved a percentage of 96.66%, and the aspect of students' interest in participating in further problem-based learning achieved a percentage of 97% so that all aspects have very good criteria. So the results obtained in all aspects, namely all students have a good response to the problem-based learning model or *Problem Based Learning*. This means that *Problem-based* learning is feasible and feasible to provide students' understanding.

## Acknowledgment

The article "Students' Response to *Problem Based Learning Learning* on the Motion System Material" can be prepared in accordance with the time with the cooperation of various parties. We would like to express our gratitude to the principal of SMA Negeri 1 Prambanan, Mr. Sigit Purwanto, S.Pd., M.Pd. along with the student teacher, Mr. Rochmat Yuwono, S.Pd. who has helped in collecting research data. Students of XI MIPA 1 XI MIPA 2, and XI MIPA 3 who have been willing to fill out the questionnaire form properly. As well as parents who have supported and prayed for the implementation of this PLP 2.

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