IMPLEMENTING PROBLEM BASED LEARNING TO INCREASE HIGH SCHOOL STUDENT'S INTEREST IN CRITICAL THINKING SKILLS

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Abstract

Learning conventional cause interest students to learning physics is low. This research aims to describe student's response in problem based learning. The type of research is *pre-experimental design* with quantitative descriptive analysis. The subject is 93 students in SMAN 1 Taman divided by three class are X MIA 2, X MIA 4, X MIA 5 that selected on random sampling. The instrument is questionnaire responses form were filled by students after receive learning. The data analyzed by percentage response from amount score each aspect and categorized based on *Likert* scale. The results show that response students to problem based learning categorized in good with the average 72,6% and could improve the interesting of critical thinking skills.

Keywords: Problem Based Learning, Student's Response, Critical Thinking

INTRODUCTION

Physics learning is expected to develop student's knowledge and thinking skills (Kemendikbud, 2016). But the physics learning is considered complicated and boring, so the student's interest in learning is quite low. Interest in learning is necessary so that knowledge and skills during learning can be well understood. This learning interest is seen from the student's response to learning. Students who tend to be passive can decrease their creativity and influence their thinking skills (Kusumaningtyas et al., 2013). The thinking skills that can be used to solve complex problems are critical thinking skills.

Based on research in SMAN 1 Taman, it showed that learning in the form of one ways explanation and discussion. So the students' critical thinking skills are low that is below 28%. During this, learning provides less skills to solve problems. According to research Gholami *et al.*, (2016) conventional learning with one ways explanation methods is less effective in improving critical thinking and metacognitive skills. It shows that learning by lecture is un-effective and un-efficient. So one solution to increase students' interest to learn physics and increasing critical thinking skills by applying problem-based learning model. Problem-based learning is an innovative lesson that is appropriate to be applied in the 21st century and prepares students to solve complex problems. Problem-based learning is chosen because (1) provides real problems, (2) encourages students to become active and engages in activities, (3) gives opportunities to map decisions (Happy & Widjajanti, 2014). The syntax of problem-based learning is shown in Figure 1,

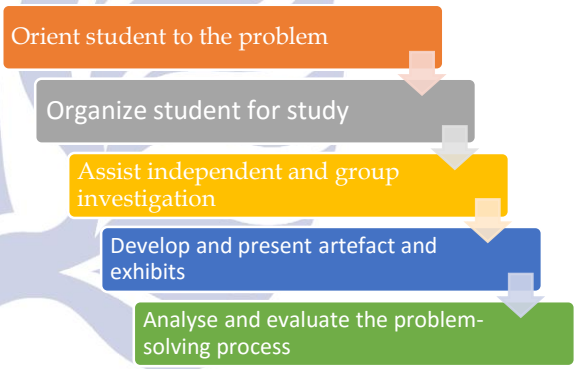

Figure 1. Syntax PBL Model

According to Arends (2012), orient student to the problem enables students to identify fact-based problems with supportive reasons. Organize student for study can make students define the problem, choose the information needed to achieve the solution. Assist independent and group investigations train students to design experiments, collect data, connect problems with outcomes, and make conclusions. Develop and present artefacts and exhibits trains communicating the results of inquiry through the exhibition. Analyse and evaluating the problem-solving process allows students to reflect on the process of inquiry and reconstruct thinking. Each phase of the PBL syntax can trace the indicator of critical thinking skills. Indicators of critical thinking skills are analysis, interpretation, inference, and evaluation.

METHOD

The implementation of PBL method of physics mater using *pre-experimental design* with quantitative descriptive analysis. The subjects were 93 students from grade X SMAN 1 Taman selected by random sampling and divided into 3 experimental classes namely class X MIA 2, X MIA 4, X MIA 5. The research was conducted on the even semester of 2017/2018. The instrument used in the research is a response questionnaire form containing 10 statements filled out by students after receive the learning. The instrument was first validated by 2 validators and calculated using *percentage of agreement* by Emmer & Millet formula, and is considered reliable if the percentage is at least 75%

$$Percentage\ Agreement = 100\left(1 - \frac{(A-B)}{(A+B)}\right)\% \quad \ldots (1)$$

(Borich, 1994)

Learning are held for 4 JP and taught by the same teacher. The student scores on the response questionnaire form and sum each scores aspect then calculates the percentage of responses by the formula:

$$respons\ (\%) = \frac{number\ of\ scores\ gained}{total\ score} x100\% \ldots (2)$$

(Riduwan, 2010)

Category: (1) Very Good if 81%–100% (2) Good if 61%-80% (3) Enough if 41%-60% (4) Rough if ≤40%.

The student's response to problem-based learning is good if the percentage ≥61%.

RESULT AND DISCUSSION

Result

Students fill out validated questionnaires with an average percentage agreement of 91.2%. Students fill out questionnaires after implementing problem based learning and obtained percentage of responses shown in Table 1,

Table 1. Student's Response

Class	Response (%)	Category
X MIA 2	73,4	Good
X MIA 4	74,4	Good
X MIA 5	69,9	Good

Table 1 shows that there is a difference in the percentage of learners' responses from the three classes, but the difference is not very significant and is still in good category. The higher the percentage of learners' responses, indicating the more positive the learner's acceptance of the problem-based learning is taught. Class X MIA 4 has the highest response, after which class X MIA 2, and the last class X MIA 5. While the response of each aspect is also calculated and obtained as Table 2,

Table 2 Response Results of Each Aspect

Statement	Response (%)	Category
Phenomena attract attention and increase motivation to learn	81,51	Very Good
The momentum and impulse material taught by the problem-based learning model is not confusing.	64,84	Good
The learning process makes it easy to conclude problem solving.	77,08	Good
Learning with problem-based learning model is not boring.	67,71	Good
Learning helps analyze problems.	77,60	Good
The activeness of students in the learning activities becomes enhanced when lessons are applied.	72,66	Good
After learning, learners are able to interpret images or graphs related to momentum and impulse.	70,05	Good
Learning makes it easy to assess the best solution of the problem.	67,97	Good
Problem-based learning helps connect problems with the concept of momentum and impulses.	73,18	Good
The learning of momentum and impulse material through virtual and real experiments helps to be skilled at designing and conducting experiments.	73,18	Good

Table 2 shows 81,51% of students agree if the phenomenon presented can increase the curiosity of learners so that the interest of learners to find information to increase. While the lowest response is in the second statement of 64.84% with good category.

Discussion

Problem-based learning process is expected to help learners deal with and solve problems related to momentum and impulses in life. The learners' responses to problem-based learning have been obtained from the response questionnaire. Questionnaire response of learners consists of 10 statements that indicate the ladder of learners during learning, the competencies gained after learning, and the interest of learners towards learning. Based on Table 1, it was found that the average percentage of student responses from the three classes was 72.6%. This indicates that students are implementing problem-based learning well and able to improve their critical thinking skills.

Based on Table 2, it was found that 32 students were still confused on the problem-based learning applied. This is because problem-based learning has

not been applied in everyday learning, so learners need time to adjust to learning activities.

Student responses related to critical thinking skills are evident from the statements 1) learning helps analyze problems by 77.6%; 2) the learning process facilitates conclusion of problem solving by 77.08%; 3) learners are able to interpret images or graphs related to momentum and impulse of 70, 05%, 4) learning makes it easy to assess the best solution of the problem of 67.97%. It shows students' responses to the 4 indicators of critical thinking skills categorized well so that it concludes increasing critical thinking skills (Anindyta, 2014; Gholami et al., 2016; Samingan et al., 2014).

Problem-based learning increase students' interest seen from statement 1) momentum and impulse material taught with problem-based learning model is not confusing 64,84%; 2) learning with problem-based learning model is not boring 67,71%. 3) the active role in the learning activity becomes increased when the learning is applied equal to 72,66%. This is because students are getting used to new learning and increasing their interest to learn physics.

CONCLUSION

Based on the results, the conclusions can be drawn such as:

Student responses in all three classes are in good category with an average of 72,65%. which indicates that positive responses to problem-based learning are applied and can improve critical thinking skills.

SUGGESTION

The suggestions can be proposed by the researchers such as:

1. Allocation of time during learning takes place more attention so that information is delivered well.
2. Need to check the student's initial motivation.
3. The researcher ensures the science process skills that the learner possesses before designing the experiment.
4. Keep in mind the activities of students during the experiment.

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