



The Implementation of Q-SETS-Based Physics Teaching Materials Containing Characters to Increase Students' Interest in Learning

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Abstract

Good physics teaching materials are teaching materials that present physics concepts that can be understood by students easily and can attract students to read and study physics. However, its implementation is currently not running perfectly. The Q-SETS-based physics teaching materials containing characters are expected to be a solution to encourage students' interest in learning physics, given that interest in learning is an important factor in achieving the success of education. This study intends to analyze the increase in students' interest in learning after using these teaching materials. The method used in this study is an experimental method with students of class X RPL 2 and X MM 3 SMK Negeri 8 Semarang as research subjects. The results of the students' interest in learning before and after being given the Q-SETS-based physics teaching materials containing the characters were 70.08% and 80.51%, respectively. Then, there was a medium category containing an increase in learning interest with an N-gain of 0.35.

INTRODUCTION

Teaching and learning activities in schools can run well if they are supported by adequate facilities and infrastructure, one of which is the procurement of learning resources. One of the learning resources that educators widely use to support learning activities is teaching materials. Teaching materials are all forms of materials that are systematically arranged that are used to assist teachers in carrying out teaching and learning activities to create a learning atmosphere that allows students to learn (Hamdani, 2011: 120).

Good physics teaching materials are teaching materials that present physics concepts that can be easily understood by students and can attract students to read and study them. However, its implementation is currently not running perfectly. Observations and interviews were conducted by Kuswandari et al. (2013) on teachers and students at SMA Negeri 1 Simo, Boyolali Regency, Central Java, showed that in physics learning process, they still used books or printed teaching materials that only contain a summary of the material and sample questions. The strategy for organizing and delivering content of the teaching materials was not well structured, and the packaging was less attractive. Many of the materials presented in the teaching materials were abstract and complicated so that students were reluctant to read them, let alone study them.

Learning physics in the classroom should use teaching materials that can attract students' interest to learn. One of them is by using Q-SETS-based teaching materials, namely teaching materials that combine the quantum learning model with the SETS approach. The quantum learning model (quantum learning) is one of learning models that emphasize the importance of teachers creating a pleasant learning atmosphere for students. Also, quantum learning emphasizes that everything which is learned both inside and outside the school must have benefits (Susiani et al., 2013). While the Science, Environment, Technology, and Society (SETS) approach emphasizes understanding science concepts that must be connected with elements of the environment, technology, and society so that in the learning process, students can connect these four elements in a single learning unit. SETS approach

can overcome the weakness of the conventional education system where students are taught to complete the subject matter without knowing its implementation in daily life (Khasanah, 2015).

Based on non-systematic observations, which is observations without using observation instruments, which researchers did when carrying out PPL (Praktik Pengalaman Lapangan) activities at SMK Negeri 8 Semarang from 29 July to 13 September 2019, students were less interested in studying physics. Students feel no need to study physics seriously. They assume that physics is not related to their future because they study at vocational schools. Physical concepts explain phenomena in daily life from simple to complex phenomena. Another factor that causes a lack of interest in learning physics for students at SMK Negeri 8 Semarang is the quality of the teaching materials that is used. Teaching materials emphasize material and examples of questions rather than application in technology, environment, and society. The concept in physics teaching materials is difficult to understand and incomplete, then it is less interesting for students to read and study it.

Based on the description above, students' interest in learning is an important element to support learning in schools. Interest is one of the determining factors in the success of education. Interest in learning is a feeling of pleasure, liking, and attention to gaining knowledge (Astuti, 2015). According to Sakti (2013), interest in learning can be grown from the beginning of the learning process by explaining the benefits of studying physics topics, both for higher education and life. After knowing the benefits of studying physics, interest in learning will grow, which will affect student learning outcomes.

In addition to students' interest in learning, other factors that needs to be considered in learning is students' character education. Good understanding not only prioritizes cognitive aspects but also needs to pay attention to the character values of students in the hope that students can apply cognitive information and character values obtained, both inside and outside the classroom. Character education is a real effort in creating learning situations that meet the self-development needs of students in learning interactions designed

to form students with character. Character values can integrate into learning in each subject and linked to the context of everyday life, one of which is by being integrated into teaching materials (Anggela et al., 2013; Ilmiwan et al., 2013; Islam, 2017; Hendriana & Jacobus, 2018). Therefore, the authors implement the Q-SETS-based physics teaching materials in the physics learning process so that it is expected to increase student interest in learning, especially vocational school students, towards physics lessons.

METHOD

This study adopts an experimental method with research subjects, namely 36 students of class

X RPL 2 and 36 students of class X MM 3 SMK Negeri 8 Semarang. The data collection method used was a questionnaire in the form of a learning interest questionnaire. The increase in learning interest was calculated using the normalized N-gain formula as follows.

$$g = \frac{\langle S_{post} \rangle - \langle S_{pre} \rangle}{\langle S_{pre} \rangle} \quad (1)$$

G is N-gain, S_{pre} is the average score before teaching materials (%), and S_{post} is after teaching materials (%). The criteria for increasing student interest in learning are presented in Table 1.

Table 1. Criteria for Increasing The Interest in Learning

Intervals	Criteria
$N\check{g}ain \geq 0,7$	High
$0,3 \leq N\check{g}ain < 0,7$	Medium
$N\check{g}ain < 0,3$	Low

RESULTS AND DISCUSSION

The excitement in learning is a feeling of pleasure, liking, and attention to gain knowledge. Students' interest in learning becomes a very important element in supporting learning in schools. Interest is one of the determining factors in the success of education. This is in line with the statement of Ilham & Andayono (2018) that interest has an important role for the implementation of learning because interest can grow the needs, desires, attention, and feelings of pleasure so that students do not feel bored while studying and will facilitate the creation of concentration. Therefore, the preparation of Q-SETS-based physics teaching

materials containing characters developed was intended to increase students' interest in learning.

The increase in students' interest in learning was measured by a questionnaire of students' interest in education. Then based on the data from the questionnaire on interest in education, an analysis of the increase in interest in education was carried out using N-gain. The student learning interest questionnaire used consists of 30 statements which include 15 favorable opinions and 15 unfavorable statements.

The results of the questionnaire analysis of students' learning interests before and after being given Q-SETS-based physics teaching materials with character are presented in Table 2.

Table 2. The Result of Analysis of Students' Learning Interests

Indicators	Before (%)	After (%)	<i>N-gain</i>	Criteria
X RPL 2	70.32	81.20	0.37	Medium
X MM 3	69.84	79.81	0.33	Medium
Average	70.08	80.51	0.35	Medium

X RPL (Rekayasa Perangkat Lunak) 2 dan X MM (Multimedia) 3 were chosen as the subject of this research because they were two different majors so that it can represent the majors in the school. However, basically they learn the same concept of physics materials, specifically in electromagnetic materials. Based on Table 2, it is shown that there has been a significant increase in learning interest with moderate improvement criteria. Students' learning interest in physics after being given physics teaching materials was higher than before being given teaching materials. These results indicate that the Q-SETS-based physics teaching materials containing characters developed were quite effective in increasing students' interest in learning. By using Q-SETS physics teaching materials containing characters, it is shown that there was an increase in the learning interest of students which is included in the high category. However, based on the research conducted, the results obtained were increased interest in learning which is still included in the moderate category. These results were due to the obstacles during the data collection process, namely learning carried out at the school where the research was still taking place online as a result of the pandemic so that researchers could not supervise the process of filling out questionnaires by students directly. If not handled directly, students will tend to fill out the questionnaires given modestly and show less seriousness.

In addition, the developed teaching materials have been able to increase students' interest in learning with significant results. The appearance of the physics teaching materials developed was made attractive by adding pictures or illustrations that support the explanation of the material. According to Nasri et al. (2019), photographs or images can make it easier for students to understand the material and function as an interesting element in teaching materials. Students were more interested in learning it.

Teaching materials were equipped with materials related to science, applications in technology, their impact on the environment, and their impact on society in each sub-chapter. Based on the research results of Suci et al. (2020), SETS

vision learning has a significant influence on student learning outcomes. Therefore, learning that implements the SETS vision can be effectively used to increase students' understanding of the material presented. In addition, SETS-based teaching materials can also increase students' interest in learning. As the results of Syarifah's research (2019), SETS-based physics teaching materials positively impact students' interest in learning. In addition to the SETS vision, the teaching materials developed are also integrated with the AMBAK (What Benefits For Me?) component of the quantum learning model which emphasizes that students were able to understand the benefits obtained after studying the contents of teaching materials. Rohimah et al. (2019) stated that through quantum learning, students can explore learning materials and relate them to daily life so that teaching and learning activities become more fun and can arouse students' interest in education. According to Inayah (2018), the quantum learning model places students in a comfortable and pleasant state so that students can play an active role in the learning process.

CONCLUSION

The learning interest of students in class X RPL 2 and X MM 3 at SMK Negeri 8 Semarang could be increased by using Q-SETS-based physics teaching materials containing characters in the learning process. The results obtained were increased student interest in learning. The research was in the medium category with an *N-gain* score of 0.35.

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