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Homepage : https://journal.uhamka.ac.id/index.php/omega

ISSN: 2502-2318 (Online)
ISSN: 2443-2911 (Print)
Omega : Jurnal Fisika dan Pendidikan Fisika
Vol **6**, No **1** (2020)

The Use Of Brain Quiz Learning Media On Improving Learning Results And Physics Learning Motivation For Class X Students Impulse Momentum Materials

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ABSTRACT

This study aims to construct the use of Brain Quiz learning media on learning outcomes and physics learning motivation of class X students of impulse-momentum material in High School (SMA) Jakarta, Academic Year 2019/2020. This type of research is pre-experiment with one group pretest-posttest design conducted on 26 students of class X in one of Jakarta's high schools. Data collection techniques using written tests and questionnaires. T-test analysis of two paired samples showed that the average pretest score of student learning outcomes was 19.67 while the posttest means the score was 75.17 with an N-gain value of 55.5 (the increase was in the medium category). While the results of the questionnaire increased student learning motivation showed 95% of students stated that with the Brain Quiz learning media made students more motivated in physical learning especially impulse-momentum material because it has its characteristics. The results showed that there was a significant increase in student learning outcomes and student motivation after the application of the Brain Quiz learning media.

Keywords: Brain Quiz, learning outcomes, and motivation to learn.

INTRODUCTION

Learning is the most important process in life, every human being has the desire and ability to learn, even starting from birth humans are encouraged to learn. In its development humans observe their environment, resulting in a thought process, where the initial ability is to imitate. As a baby imitates how to say words, maintain balance when learning to walk, and so forth. According to Ahmad Syarifuddin learning is a change in behavior that is relatively permanent in a person due to experience or training that involves physical or psychological aspects, such as from not knowing to knowing, from not knowing to knowing about something, from knowing to knowing more, from not having skills become have skills and so on[1]. Based on this understanding, learning is a process of behavior change based on experience including knowledge and skills. No exception to learning physics in class, physics learning will be meaningful if the students themselves experience it, so knowledge is constructed on its own and will last for a long time. Therefore, the teacher's role is very important to condition innovative physics learning activities so that students can be actively involved in the learning process.

Experience-based learning can optimize student physics learning outcomes which include cognitive, affective, and psychomotor domains. This is relevant to the improvement of the quality of education aimed at improving the quality of Indonesian people wholly through sports, thought, sports, and sports to have competitiveness in facing global challenges [2].

But in reality, the physics learning process that occurs in classrooms is still not ideal. Students are only asked to remember what the teacher teaches not to be given motivation to find their own knowledge. As a result, students cannot solve problems that arise [3], [4]. This is

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based on observations of one school in Jakarta, student physics learning outcomes are not optimal because the physics learning process is still conventional, which is considered monotonous and boring for students. So students are less motivated to learn physics.

To achieve optimal student physics learning outcomes, the teacher's role is very important in creating innovative learning processes and can support the success of student physics learning processes. One of them is through the use of brain quiz learning media in the learning of impulse-momentum material physics, brain quiz learning media is one of the M-Learning learning media in the form of an android application. M-learning has a positive impact on students, which can motivate students and increase student enthusiasm in learning and attract students in understanding the material [5]. Previous studies related to research on learning outcomes and learning motivation are studies conducted by Sulihin B. Sjukur with the title Effect of Blended Learning on Learning Motivation and Student Learning Outcomes at Vocational Level, in 2012 which concluded that there were differences in learning motivation between students taught by blended learning compared to students who are taught conventional learning, then there is an increase in student motivation due to the application of blended learning and there is an increase in student learning outcomes [6]. Further research related to using technology-based learning media one of which is research conducted by S Sari, R Anjani, I Farida and MA Ramdhani with the title "Using Android-Based Educational Games for Learning Colloid Material" in 2017, the research aims to help students learn colloidal material and apply it in everyday life with the use of android-based educational games [7].

Based on the State of the Art above, this research is related to the use of physics learning media in the form of Android applications assisted by the Brain quiz game which is used to measure student learning outcomes and motivation to learn physics on impulse-momentum material.

RESEARCH METHODS

The method used in this study is the initial experimental method or pre-experiment. This method was chosen by research objectives that only want to see the output (learning outcomes) of using a media brain quiz on improving student learning outcomes and motivation.

This study uses a one-group pretest-posttest design. With this design, the research subjects are a class of experiments without comparison. In a one-group pretest-posttest design, a single subject group is given a pretest / initial test (O), treatment (X), and posttest / final test (O). The instruments at the same pretest and posttest are given at different times. The design in this study is shown in Figure 1.

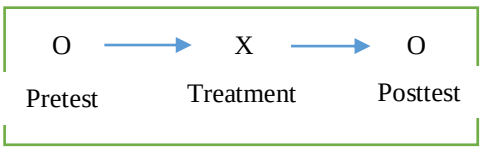

Figure 1. Pretest-Posttest One-Group Research Design

Information:
O: The pretest is the same as the posttest
X: The use of brain quiz learning media

This research was conducted through three stages, namely the planning stage, the implementation phase, and the final stage. The subjects of this study were students of class X semester 2 with a total of 26 students in one of Jakarta's high schools, academic year 2019/2020 who would take physics in the subject of impulse and momentum. The sampling technique is by purposive sampling. The instrument for the study used was the student achievement test and motivation questionnaire, the test used in the study was tested first, after which the validity, reliability, difficulty level and distinguishing power of each item were analyzed. To see an increase in learning outcomes learning uses a formula

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developed by Hake [6].

$$N-Gain = \frac{< S_{post} > - < S_{pre} >}{< S_{maks} > - < S_{pre} >} \quad (1)$$

Information:
$<S_{post}>$ = average final test score
$<S_{pre}>$ = average initial test score
$<S_{maks}>$ = average maximum score

This normalized gain (N-Gain) is interpreted to state student learning outcomes on impulse momentum material with the following categories:

Table 1. Category Level N-Gain

Limits	Category
$N-Gain > 0{,}7$	Height
$0{,}3 \geq N-Gain \leq 0{,}7$	Medium
$N-Gain < 0{,}3$	Low

The data obtained from the questionnaire is calculated using the formula.

$$T = \frac{1}{N} x100\% \quad (2)$$

Information:
T = percentage of attitude towards each statement
J = number of answers for each attitude group.
N = number of students

Table 2. Score Questionnaire Likert Scale Questionnaire

No.	The Nature of the Answer Statement	Student Answers			
		SS	S	TS	STS
1	Positive	4	3	2	1
2	Negative	1	2	3	4

RESULTS AND DISCUSSION

Learning outcomes data in the form of pretest scores and posttest scores that have been obtained are identified in advance so that the distribution or distribution of data can be known through the normality test. Data normality test for pretest scores of student learning outcomes on impulse momentum material uses test criteria taken based on the probability value with a significance level (α) of 0.025. The result is 0.087, the value is greater than the significance level. Thus it can be concluded that the concept score of the mastery of the pretest score is normally distributed. While for the normality test of the posttest data score the significance value is 0.445, this value is greater than the significance level (α) 0.025. So that the conclusion is that the posttest score data mastery of concepts is normally distributed.

Based on the explanation above, it can be seen that the pretest and posttest data of student learning outcomes are normally distributed, so as to see the improvement in student learning outcomes between before and after the use of the media learning brain quiz is done by t-test. Hypothesis testing is performed on the pretest and posttest scores, in accordance with the proposed hypothesis that is about improving student learning outcomes. The comparison of average scores for pretest, posttest and N-gain student learning outcomes impulse momentum material is presented in Figure 2 below:

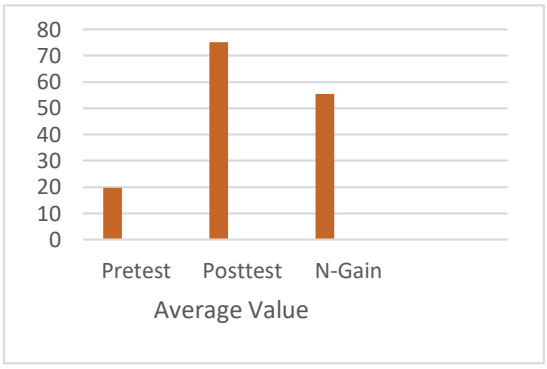

Figure 2. Average Pretest, Posttest and N-gain Learning outcomes

The figure reflects that the increase in student physics learning outcomes by 55.5 is in the medium category. According to Hartini, physics learning outcomes are complex knowledge obtained by a student after getting a physics lesson that is evaluated through a set of

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questions or test results, a student can be said to succeed in physics if it meets the completeness of each indicator that is adjusted to the whole domain [8]. From this opinion it can be stated that the physical learning outcomes are complex knowledge that meets the completeness of each indicator that is adjusted to the whole domain, the intended domains are the cognitive (knowledge), affective (attitude), and psychomotor (skill) domains.

When connected with physics learning outcomes in this study leads to changes in students' cognitive level (knowledge). This can be seen from the average pretest value of 19.67 and the average posttest value of 75.17. So that it can be reflected in an average increase in knowledge of N-gain students by 55.5, which is classified in the medium category.

One of the factors that influence learning outcomes is students' motivation to learn physics. Motivation can be interpreted as the strength (energy) of someone who can cause a level of willingness in carrying out an activity [9]. From this opinion, it is clear that motivation is a driving force that can influence the sustainability of an activity process including the learning process to achieve the expected learning goals. Motivation to learn has a very important role to achieve a goal of the learning process. Therefore, the teacher has an extraordinary function of importance in fostering students' motivation to learn physics. Teachers are required to be able to create innovative learning, so students can be motivated to follow the learning process well. In a simple sense, learning motivation is very important to achieve the objectives of the learning process.

Student motivation in the learning process can be built from outside of students, meaning that it is conditioned by the teacher, one of them is by creating enjoyable learning situations and conditions through the use of physics learning media in the form of games, especially impulse-momentum material with brain quiz media. This Android-based learning media that is assisted by brain quiz games pays attention to the aims of instructional games that are challenging, fantasy and arouse curiosity. Basically, physics learning media in the form of brain quiz games are used to arouse students' physics learning motivation, especially impulse-momentum material. As the results of this study. With the use of brain quiz learning media, students have a high motivation to learn physics and want this media to continue to be used. After all, it makes it easy to master the concepts of physics and is interesting because it is in the form of games. From the questionnaire collected, as many as 95% of students wanted to use this brain quiz learning media to be applied in the concept of physics in addition to impulse-momentum. These results can be seen in the following Table.3 :

Table 3. Scale of Student Attitudes Toward Student Learning Motivation

Attitude	Problem number	Nature of Statement	Average student attitude score
Student learning motivation using brain quiz learning media	**1**	Positive	3.63
	7	Negative	3,73
	13	Positive	3,68
	14	Negative	3,50
	19	Positive	3,63

CONCLUSION

The results showed that there was a significant increase in student learning outcomes and student motivation after applying the Brain Quiz physics learning media to impulse and momentum material. Follow-up research is needed using experimental research methods.

ACKNOWLEDGEMENT

The researchers would like to thank the UHAMKA research institute, the physics Education Study Program Faculty of Teacher Training and Education UHAMKA, and SMA Muhammmadiyah 4 Jakarta for providing support for the implementation of this research activity.

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ISSN: 2443-2911 (Print)
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Vol **6**, No **1** (2020)

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