E-Assessment Motivation in Physics Subject for Senior High School

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E-Assessment Motivation in Physics Subjects for Senior High School

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Abstract—The use of technology in education can be utilized in the assessment, namely in the form of e-assessment. E-assessment is an assessment with an online system (e-assessment). Can make assessment more efficient in terms of time, funding, and achievement of assessment objectives. This study adopted Thiagarajan's research with the stages of development and evaluate. The number of samples used was 168 students and 14 teachers from senior high school 10 in Batanghari and senior high school in 5 Batanghari. The findings of this study are the system description, this motivational e-assessment is made from MySQL software, because of the ease of installation and use and small hard drives and memory traces. And this application can be used simultaneously. Exploration results show that effective assessment using motivational e-assessment has a good category of 72.6% with a total of 122 students from 168 students. Then the response of teachers using motivational e-assessment is in a good category 50.0% with a total of 7 teachers from 14 teachers, which means the teacher's response to student motivation is very good in assessment or evaluation. This is that e-assessment is important to use because it can make it easier for teachers to make an assessment of themselves because it is in line with the Industrial Revolution 4.0.

Keywords—E-Assessment, Motivation, MySQL

1 Introduction

Education in the present very much requires the use of technology to improve the competence of increasing human resources. because now is the era of industrial revolution 4.0. Four domains of the 21st century are literacy digital era, High Order Thingking Skills collaboration social skills and productivity in the production [1]. The progress of information and communication technology has transformed the teaching and learning process towards a portable, student-centered and multi-platform environment [2]. Changes and technological advancements in various fields, for example in communication and information technology today [3]. Therefore, development in information technology and communication is needed. The development of

information and communication technology can be used to support and develop children's cognitive, affective and social skills [4]. E-learning is one of them, e-learning is a form of information technology that is applied in the field of education in the form of cyberspace [5]. Utilization of E-Learning as an educational technology requires design, in order to be able to carry out effective learning and improve learning outcomes of students so that learning objectives can be achieved [6]. If in learning that is based on digital or online, then there must be a discussion in the research system as well. Therefore need an online-based assessment or E-Assessment in particular education. The use of information technology and computers in the world of education is often used as a medium of learning and evaluation of learning [7].

Assessment is a core activity in higher education [8]. Because besides teaching activities, the other most important thing is research. Assessment is used to provide evaluations of the results of learning that have been done by students. evaluation is intended to know the quality of teaching [30]. Assessment is not only seen from the learning outcomes of these students, but we can also see from changes in the behavior of students can also monitor student progress and provide feedback during learning takes place. Indonesia itself evaluates learning outcomes on average using the conventional method of the paper-based test [7]. In conventional assessments position students as recipients of knowledge where learning is measured and documented at the lowest level of Bloom's taxonomy as knowledge and understanding [9]. In this conventional method still using paper and stationery in its assessment, therefore it requires a long time in the assessment process and high costs, conventional assessment requires paper and stationery to support the assessment process. This is in accordance [7] conventional valuation is less efficient because it requires more costs, and is less effective in the evaluation process because it requires a longer time in the assessment process. The weakness of this can be overcome by using information technology and computers. So that it can change the system that is still conventional in a computer-assisted or computerized system in the form of an e-assessment [7]. In e-assessment not only do teachers act as evaluators but students also can. Students can act as writers and evaluators in e-assessment [10]. In addition, according to [11] assessment with an online system (e-assessment) can make assessment more efficient in terms of time, funding, and achievement of assessment objectives. When online, it can minimize the level of student fraud in carrying out the exam and reduce the level of subjectivity in processing data.

Besides being used in evaluating or evaluating learning outcomes or in the cognitive domain. E-assessment can also be used in assessments in the affective domain, affective domains must also be assessed because in the era of industrial revolution 4.0 is demanded collaboration to occur, hence the affective domain in this case motivation is very important for students in their development in learning. alternative assessments include affective domains and team activities, self and peer evaluation, and reflection through logs and portfolios, type of assessment examine students' traits of character [9]. According to [12] motivation has a function to 1) Encourage the emergence of behavior or action. Without motivation, there will not be anything like learning. 2) Motivation functions as a guide. This means directing the deed to achieve the

desired goal. 3) Motivation functions as a driver, it functions as an engine for cars, the size of motivation will determine the speed or slowness of a job.

In motivation, e-assessment is used to measure in the field of affective domains of students by using the MySQL application. According to [13], Database server (MySQL) is a program that can store large amounts of information in organized formats that are easily accessed through languages PHP programming. There are various SQL and NoSQL database management systems in selecting the most appropriate system for using e-assessment [14]. In determining the database to be used must be in accordance with the needs of the application to be made. SQL is the only program language supported by procedures, but there are plans to introduce a framework to support other languages in the future. According to [15], Process Data (SQL) is an automatic information process that processes continuous data flows. There are several servers that can input data into a database, including MYSQL (My Structured Query Language).

In the learning process, especially in physics, student attitudes are very important [34]. Because, students who have this view will have different attitudes, with students who have more positive views during the learning process [35]. So from that we need evaluation or assessment, in this study that was assessed was the motivation of students. As for e-assessment using "SESKA", Seska is an E-Assessment development system in assessing student motivation that follows the development of 4.0 industrial revolution in education. SESKA is developed based on the MySQL database server and then it can be operated into Smarthpohne/mobile. According to [14], a database server (MySQL) is a program that can store large amounts of information in an organized format that is easily accessible through the PHP programming language. There are various SQL and NoSQL database management systems in choosing the most appropriate system to use e-assessment [15]. Mysql is one of the servers for inputting, in this case, is data on motivation for high school students in Batanghari. According to [16] Mysql is a great tool for us to learn about in general because of the ease of installation and use and small hard drive and memory traces. It is also important to remember that MySQL and other relational databases are multi-threaded, which means that they can process directives from multiple clients simultaneously [17]. According to [18] Caching queries are one of the biggest of the additional MySQL speeds. Simple and very effective when activated, query caching causes MySQL to save a SELECT query, along with the corresponding results, in memory. Mysql currently has three commercial licenses called, standard, Enterprise, and cloud which will provide a combination of additional features and support along with product upgrades [19]. In the development of student evaluation media to find out the scores obtained, the score must be stored in the database. In order for the score to be stored in the database, a PHP script is needed to save the score to the MySQL database on the server [20].

In this study, the main problems or problems in high school 10 rodents and high schools 5 days, namely: Describe the motivation e-assessment system, identify e-assessment of student motivation, then the teacher's response to learning using motivational e-assessment.

2 Methods

This study adopted from the research (Thiagarajan & Semmel, 1974). It was carried out by stages namely Develop (development stage) and Evaluate (evaluation stage). Develop carried out the stage of developing and making e-assessment based on the flowchart and storyboard that already exists, evaluation is used as long as to describe the measurements referenced criteria that have high potential to influence the decision making the process, in this study using a questionnaire for the instrument. [21].

- The Development Stage, at this stage, the development and manufacture of e-assessments based on flowchart and storyboard are carried out. In this stage, the analysis consists of an analysis of hardware requirements (hardware) and software (software). Analysis of hardware requirements (Hardware) is carried out to find out and obtain the tools that need to be fulfilled to run the application to develop e-assessment. While the software requirements analysis is done to find out what software needs to be prepared so that e-assessment can be developed. Software design is a process that consists of four different attributes, namely data structure, software architecture, interface representation, and algorithms. The design process translates requirements into programs developed from [22].
- Evaluation, at this stage an overall evaluation is carried out. Every process that has been passed to produce a product developed, and that connects designers and users directly. By containing elements of formative evaluation. Product evaluation was developed based on student motivation questionnaires and teacher responses obtained [23].

This study used a sample of 14 teachers and students totaling 168 respondents from two high schools, namely high schools 10 rodents and high schools 5 cigarettes a day. The sampling technique used was purposive sampling technique. Purposive sampling technique on criteria of the researcher [24]. The criteria in this study were high school students and female students who were ranked in the top 8 in their class.

3 Results and Discuss

Students can be viewed from the characteristics of students, namely from student motivation or feeling happy, or just ordinary from the student. That student attitudes can be seen from feeling happy, unhappy, like or dislike, motivated or unmotivated. Attitude is a term that reflects pleasure, displeasure or an ordinary feeling (neutral) of a person towards something [25]. Vocational learning was reviewed from the e-assessment used to measure student motivation. [26] on online learning and assessment (e-assessment) have several advantages, namely learning in learning so that it is more refreshing (fresh), skills in managing more content. Therefore an online assessment or e-assessment is needed. E-assessment that is used using MySQL software. According to [16] Mysql is a great tool for us to learn about in general because of the ease of installation and use and small hard drive and memory traces.

3.1 Motivation

For the results of the motivation questionnaire, it can be seen as the table below:

Table 1. Results of Questionnaire for Motivation of Students at Batanghari State High School

Category			Standard Deviation	Mean	Max	%
Interval	*Attitude*	*Total*				
23.0 – 41.0	Very Not Good	0	12.6	81.5	115	0
41.1 – 59.0	Not Good	1				0.6
59.1 – 77.0	Enough	20				11.9
77.1 – 95.0	Good	122				72.6
95.1–115.0	Very Good	25				14.9
TOTAL		168				100

In table 2, it was obtained from 168 respondents from secondary schools and had been processed using the SPSS program, with the following results: Standard Deviation 12.6, Mean 81.54, Mode 78, Median 81, Minimum Value 38, and Maximum Value 115. The data were processed using the SPSS application, the attitude results have a good category of 72.6% for a total of 122 out of 168 students, enough at 11.9% with a total of 20 out of 168 students. Very good at 14.9% for a total of 25 out of 168 students and Not Good at 0.6% for a total of 1 of 168 students.

3.2 Teacher Response

For the results of the Teacher Response Questionnaire, we can see the results in the table below:

Table 2. Results of Student Learning Resources Questionnaire at the Batanghari State High School

Category			Standard Deviation	Mean	Max	%
Interval	*Attitude*	*Total*				
15.0 – 27.0	Very Not Good	0	7.08	58.49	28	0
27.1 – 39.0	Not Good	1				3.1
39.1 – 51.0	Enough	3				21.4
51.1 – 63.0	Good	7				50.0
63.1 – 75.0	Very Good	4				26.5
TOTAL		14				100

In table 2, it was obtained from 14 respondents from middle school and had been processed using the SPSS program, with the following results: Standard Deviation 7.08, Mean 58.49, Mode 63, Median 60, Minimum Value 28, and Maximum Value 72. The data were processed using the SPSS application, the attitude results have a very good category of 26.5% for a total of 4 out of 14 teachers, both at 50.0% with a total of 7 out of 14 teachers. Enough at 21.4% for a total of 3 out of 14 students and not good at 3.1% for a total of 1 in 14 teachers.

The program system developed is SESKA that uses program language that is made on Macromedia Dreamweaver MX 2004 applications in the form of PHP. Using PHP uses a scripting language that embeds HTML from web pages. When the evaluator wants to return to the destination page, the web server executes the PHP script and replaces the results back to the page [27].

The work system in this E-Assessment is the start page, there are 3 main menus, namely the homepage, physics, and science menus. The homepage menu contains images of researchers while observing the high school in Batanghari. On the Physics menu contains 3 menus, namely the home menu to return to the start menu, the motivation menu which contains questionnaires on students' motivation towards physics and the physics attitude menu that contains student physics attitude questionnaires. After the data is inputted by students or teachers on each questionnaire, then the data will be stored automatically on the database contained in MySQL. We can display the data on MySQL in ordinary data and in graphical form like the picture. 4.

Online assessment or e-assessment is a new way of taking an assessment. e-assessment is an effort to replace conventional assessment into computer-based assessment [7]. Motivational e-assessment can be seen initially in figure 1:

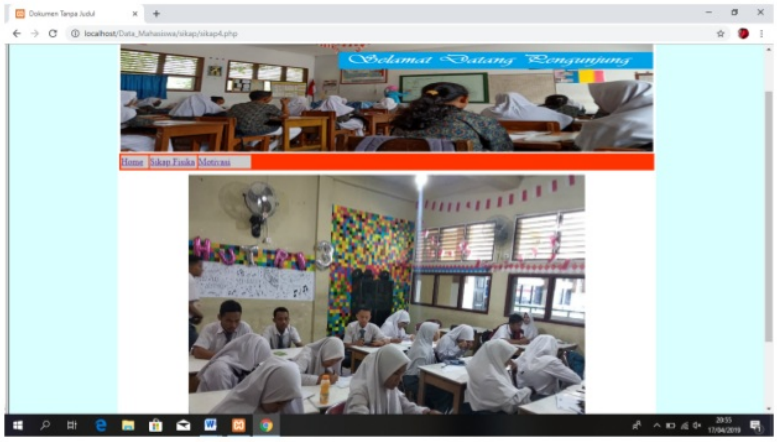

Fig. 1. The initial view of the motivational e-assessment

Figure 1 shows the homepage of the motivation e-assessment of students in the MySQL program.

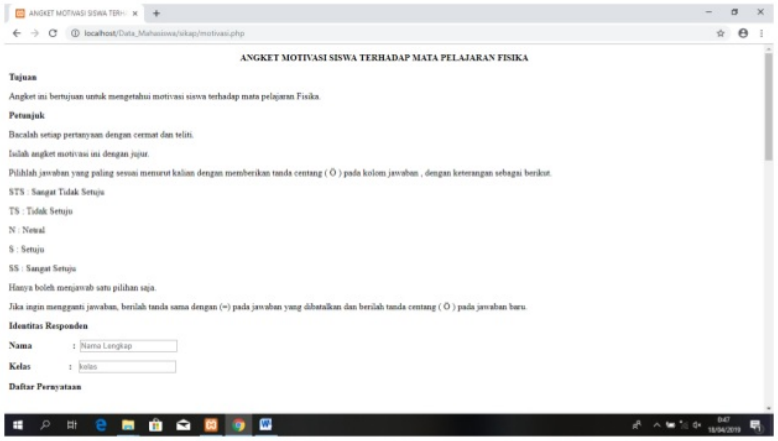

Fig. 2. Display of Biodata of Motivation E-Assessment

Figure 2 shows the biodata of the motivation e-assessment of students in the MySQL program.

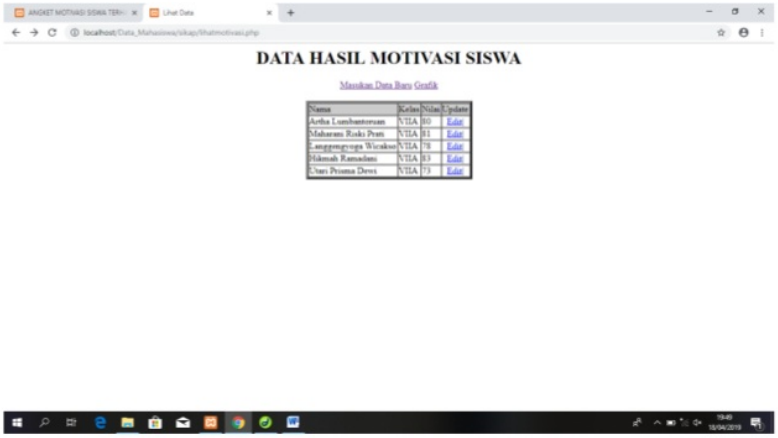

Fig. 3. Display of Results from Motivation E-Assessment

Figure 3 shows the results of the motivation e-assessment of students who have filled out the motivation questionnaire in the MySQL program.

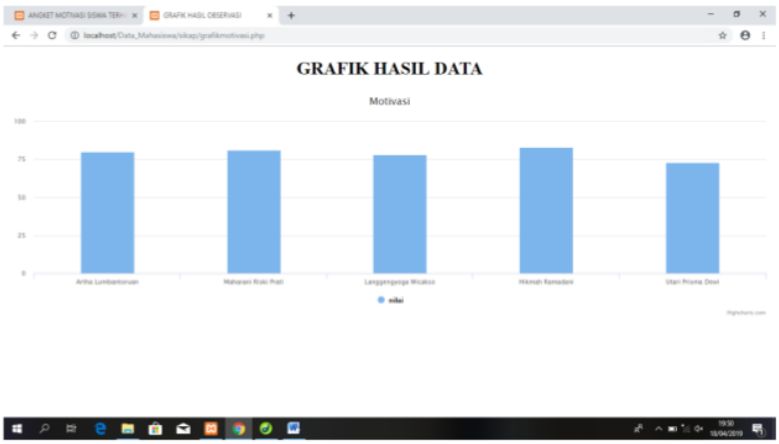

Fig. 4. Graph of results from motivational E-Assessment

Figure 4. A graph of the results of e-assessment motivation of students who have filled out student motivation questionnaires in the MySQL program.

The use of information and communication technology can provide updates in the world of education in this case e-assessment. The use of innovative ICT-based applications can be used in assessments [32]. [36] This is due to a lack of trust in their subject knowledge compared to their ICT knowledge and skills Utilization of e-assessment is the use of ICT in learning and assessment can provide convenience for its users (lecturers and students), effective from various situations and has a positive impact on the development of students' attitude and conceptual understanding skills [28]. [26] on online learning and assessment (e-assessment) have several advantages, namely learning in learning so that it is more refreshing (fresh), skills in managing more content. Therefore an online assessment or e-assessment is needed.

Evaluation is carried out with a series of empirical tests involving users (students and teachers) of the models that have been developed. assessment is considered important because competency requires an evaluation method that is tailored to its nature, that is, assessment activities and learning activities must be of the same type [31]. The results of the teacher's questionnaire responses to student motivation were processed using the SPSS program, with the following results: Standard Deviation 7.08, Mean 58.49, Mode 63, Median 60, Minimum Value 28, and Maximum Value 72. The data were processed using the SPSS application, at attitudinal results have a very good category of 26.5% for a total of 4 out of 14 teachers, both at 50.0% with a total of 7 from 14 teachers. Enough at 21.4% for a total of 3 out of 14 students and not good at 3.1% for a total of 1 in 14 teachers. From the results of the teacher's response questionnaire, we can see that the teacher thinks that students have good motivation by showing a percentage of 50.0%. The teacher thinks his students have good motivation. Based on the results of processing the high school questionnaire data on the

motivation questionnaire in good category with a percentage of 72.6% with a total of 122 out of 168 students. From the results of this data, it can be said that students are interested in participating in physics learning. The findings in the field that are categorized as good are known that when physics is about experiments, students are happy to implement it, for example, immediately rush to the physics laboratory, sit in front of the lesson, and always ask and answer questions when practicing given by a physics teacher. In addition, students are motivated to learn in class because of the comfortable laboratory space that makes students eager to go to the laboratory. Because comfortable classrooms can grow students' skills and increase the fun in learning [29]. Then when physics lessons take place, students look happy when they work on the questions or physics assignments given by the teacher. Because students have an inner spirit that causes stimulation to do anything. Students who have the willingness to learn physics are generated from within themselves [12].

4 Conclusions

The results of the system description, this motivational e-assessment is made from MySQL software, because of the ease of installation and use and small hard drive and memory traces. And this application can use multi-threaded, so that processing instructions from several students can be used simultaneously. Exploration results show that effective assessment using motivational e-assessment has a good category of 72.6% with a total of 122 students from 168 students. Then the response of teachers using the motivational e-assessment is in a good category 50.0% with a total of 7 teachers from 14 teachers, which means the teacher's response to student motivation in the e-assessment is very good in assessment or evaluation. This is that e-assessment is important to use because it can make it easier for teachers or students to make an assessment of themselves because it is in line with the industrial revolution 4.0.

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