Optimizing the Use of Web-Based Assessment-Based Mobile Learning to Measure Student Character in Science Subjects

Astalini(✉), Darmaji, Dwi Agus Kurniawan, Fhadira Insani Putri, Sri Muslimatul Husna, and Rido Ilham Widodo

Faculty of Teaching and Education, Universitas Jambi, Jambi, Indonesia
astalinizakir@unja.ac.id

Abstract. The purpose of this study was to find out students' reactions to the use of web-based assessment mobile learning to assess students' curiosity and tolerance towards science subjects in junior high schools. This study uses a quantitative approach. The data analysis technique used is descriptive statistics. The data in this study were obtained using a student response questionnaire. The results of data analysis show that the average user response is in the very good category. This shows that students respond positively to the use of web-based mobile learning-based assessments in measuring the character of students' curiosity and tolerance towards science subjects, and the use of web-based assessments has many advantages, including cost-effectiveness, data processing efficiency, and ease of use. It is hoped that future researchers will be able to measure traits other than curiosity and tolerance. This aims to determine the effectiveness of web based assessment in measuring student character in science subjects.

Keywords: Character · Mobile learning · Science · Web-Based Assessment

1 Introduction

All aspects of human life will be affected by the rapid and dynamic development of science and technology [1–3]. Technology will advance in line with the development of science, so it will greatly help the world of education [4–6]. The world of education will be affected by technological advances, especially in terms of increasing human resources to achieve educational success [7, 8]. Because it can design creative learning activities, the use of technology in education will improve the quality of learning [9, 10]. With the use of smartphone technology in today's era, a learning design can be referred to as a smartphone learning tool or what we usually know as mobile learning.

Mobile learning is an example of a learning model that can be used anywhere and anytime [11]. Clark Quinn states that mobile learning is "the intersection of mobile computing and e-learning: resources accessible wherever you are, powerful search capabilities, rich interactions, strong support for effective learning and performance-based assessment". Clark Quinn expressed his opinion that the combination of mobile and

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e-learning will broaden access to resources, wherever search is strong, enrich interaction and support access that will not be limited by space and time. With this aim, the application of mobile learning in classroom learning activities will be able to increase the ability and access to learning resources and is not limited by space and time. One of the uses of mobile learning can be used in science learning.

Science learning is one of the subjects in the 2013 curriculum that studies empirical and exact matters that have scientific study concepts obtained through a series of scientific methods. Science learning is applied with general principles that apply in understanding the nature of science associated with daily activities [15, 16]. There are three domains of values in society, namely the value of education, the value of science, and the value of science education which have differences so that with a strong science education curriculum, evaluation (assessment) of student knowledge is indispensable. The assessment carried out by educators includes three aspects, namely aspects of attitude, knowledge, and skills where attitude assessment is carried out to obtain information that describes the behavior of students [18].

Strengthening student character is a step in realizing national education goals because it is a reflection of the nation's character. Permendikbud Number 20 of 2018 concerning Strengthening Character Education (PPK) explains that PPK is carried out by applying Pancasila values in character education which includes religious attitude, honesty, tolerance, discipline, hard work, creative, independent, democratic, curiosity, enthusiasm, nationalism, love of the motherland, respect for achievement, communicative, love peace, love to read, care for the environment, care for the social, and be responsible. Thus, students are expected to be able to develop strong character and mentality in facing life in the future. Character education is also expected to be able to foster a caring attitude among students, so that a sense of security, comfort and harmony is easily created in the educational environment.

Karakter toleransi sangat penting dalam kehidupan society because it can shape the human person in making rational considerations in making a decision. Tolerance also has a positive effect on student learning [23]. A student who has an attitude of tolerance will be more sensitive to friends who are experiencing or are having learning difficulties. Curiosity is an attitude and action that always seeks to know more deeply and broadly from something that is learned, seen and heard. According to [25], states that good character includes understanding, caring, and action based on ethical values, including cognitive, emotional, and behavioral aspects of moral life. So that the assessment of student character in science subjects is very necessary in learning science.

Assessment of student character is defined as the attitude and character of students who are carried out consistently so that it plays a very important role. Student characters are used to analyze student characters obtained from learning [27]. Character education can be instilled through various circumstances, both from academic activities, self-development, to things that are spontaneous. Character education is embedded in the entire teaching and learning process, from the curriculum to the classroom.

One form of technology-based assessment is known as e-assessment. The widely used e-assessment is a web-based assessment. Web-based assessments are widely used today and replace paper-based assessments [30, 31]. Electronic assessment systems, especially web-based assessments, can facilitate assessments on a wider scale [32, 33].

Table 1. Categories of User Responses

Range	Score	Category
1,00–1,75	1	Very not good
1,76–2,50	2	Not good
2,51–3,25	3	Good
3,26–4,00	4	Very good

Web-based assessments that are used as assessment media have the advantage of being able to provide feedback quickly or in real time and can find out where students' mistakes are quickly [34]. Based on the background above, the purpose of this research is to find out how to optimize the use of mobile learning by using web assessments to measure students' character towards science subjects at SMPN 30 Muaro Jambi.

2 Method

This research is a quantitative research. The research subjects in this study were active students at SMPN 30 Muaro Jambi. Data collection was carried out using a user response questionnaire, in this case the users were students of SMPN 30 Muaro Jambi. Purposive sampling is the selection method used in this study [35, 36]. Purposive sampling is a sampling technique based on certain criteria which are calculated carefully. Purposive sampling is used in research to find subjects based on unique considerations in accordance with research objectives and needs [37, 38].

The user response questionnaire uses a Likert scale with a score of 4 for the very good category, a score of 3 for the good category, a score of 2 for the less good category, and a score of 1 for the very bad category. Categories of user responses to the use of mobile learning to measure student character in science subjects can be seen in Table 1.

The user response data processing technique is carried out using descriptive statistics. Descriptive statistics are concerned with describing or providing information about a data or situation or phenomenon.

3 Result and Discussion

The use of web-based assessment-based mobile learning has many advantages over paper-based assessments so that it becomes a new innovation in the assessment process. Therefore, mobile learning is needed in measuring students' character in science learning. The website has features that are easy for users to use when assessing student character in science learning. E-assessment which is also known as electronic assessment has a number of benefits that make it more fun to use. To assess students' character in science learning, electronic assessments such as web-based assessments are needed. Descriptions of user responses to the optimization of mobile learning to measure student character in science subjects can be seen in Table 2.

Table 2. Description of user response statistics

Interval	F	%	Category	Mean	Med	Max	Min
1,00 – 1,75	0	0%	Very Not Good				
1,76–2,50	0	0%	Not good	3,36	3,48	3,82	2,95
2,51–3,25	5	25%	Good				
3,26–4,00	15	75%	Very good				

Table 3. Descriptive statistical test results for the characters of curiosity and tolerance of SMPN 30 Muaro Jambi students

Character	Interval	F	Category	Mean	Med	Max	Min
Curiosity	5,0– 9,0	0	Very Not Good	3,56	3,53	5,00	3,00
	10,0–13,0	0	Not Good				
	14,0–17,0	5	Enough				
	18,0–21,0	8	Good				
	22,0–25,0	7	Very Good				
Tolerance	5,0– 9,0	0	Very Not Good	3,47	3,00	5,00	3,00
	10,0–13,0	0	Not Good				
	14,0–17,0	6	Enough				
	18,0–21,0	9	Good				
	22,0–25,0	5	Very good				

Table 2 shows the results of student responses to mobile learning to measure students' attitudes towards science subjects. Based on the table obtained numerical scores from 50 respondents by producing valid data for a minimum value of 2.95 and a maximum value of 3.82, an average of 3.36, a median of 3.48, and a mode of 3.45. Based on the percentage of responses, 25% responded well and 75% responded very well to the use of mobile learning to measure students' character in science subjects.

Table 3 shows that the character of curiosity as measured using a web based assessment obtained an average value of 3.56. Based on the percentage obtained, 40% of SMPN 30 Muaro Jambi students have a good curiosity character in learning science. In the character of tolerance, an average value of 3.47 is obtained. Based on the percentage obtained, 45% of SMPN 30 Muaro Jambi students have good tolerance characters.

Character is basically obtained through interaction with parents, teachers, friends, and the environment. Character can also be obtained from direct learning outcomes or through observing others [39]. Therefore, instilling character values in participants cannot be formed automatically in a short time. Planting character values requires education

that must be carried out continuously or habituation in learning. Therefore, it is necessary for teachers or educators to build positive habits by applying character values to students.

Web-based assessments have many advantages over paper-based assessments. Web-based assessment provides feedback in the assessment process [40]. This is in line with [41] that web-based assessment provides feedback that students can receive directly. In addition, online assessments are able to accommodate a large number of assessments. This is in line with [42] which suggests that web-based assessments can include a large number of assessments at once. The use of web-based assessment will allow students to receive information directly so that it is very efficient to use. The use of web-based assessment will generate user responses to web applications.

User responses to web-based assessments to measure students' character in science subjects can show the results of how the website is used in the assessment process. Assessment of student character in website-based science subjects can increase student interest in learning. In addition, the use of the website can train students' independence and activeness online to support the learning process so as to produce a positive attitude of students in learning. In addition, research on students' responses to student character assessment for science subjects will also make the assessment process more complex.

Research on user response has been carried out by many researchers before. It was found that students had good user responses to the application of web-based assessments to measure science process skills [43]. This was indicated by respondents who stated that web-based assessments made assessment activities more varied and easy to use. In addition, the assessment of students' affective domains carried out with website-based assessments can increase students' interest in learning [44]. Therefore, the use of web-based assessments is able to make assessments more innovative and make students more interested and interested in learning science. The development of e-assessment to assess student attitudes and character needs to be carried out effectively and efficiently because it can be used remotely and interactively [45].

Based on the research that has been done, it shows that the use of mobile learning is very necessary in measuring student character. Studies of user responses to the application of mobile learning to measure students' character in science subjects have never been carried out by researchers before. Therefore, the new thing in this research is to examine the response to the application of mobile learning to measure students' character in science subjects at SMPN 30 Muaro Jambi.

The use of e-assessment is highly recommended because it makes it easier for teachers and students to carry out assessments, in accordance with the tests used to assess the character of junior high school students in science classes. This is corroborated by research looking at e-assessment to measure students' interest in learning physics, which found that students responded well and enjoyed using it [46]. Consequently, there is a need to increase student interest in e-assessment.

This research has implications for the science learning process, especially in the assessment process. The assessment process is very important for learning, so it must be done with care. Well, the assessment procedure will lead to superior science education. As a result, this study influences how well students can use laptops during the learning process, which will help the learning process itself. Besides making it easier for teachers,

web-based character assessment also results in a much more effective and efficient assessment process because there is no need for manual correction of student responses. By using technology-based learning assessment, teachers are expected to be able to deal with technological advances and make their classes more effective and efficient. Therefore, this research is expected to be the basis for creating a technology-based assessment process to help implement better learning.

4 Conclusion

Based on the results of the research that has been done, it can be concluded that users (students) have a very good response to the application of mobile learning which is used to measure students' attitudes towards science subjects. Mobile learning-based assessment has many advantages, namely ease of operation, time efficiency in data processing, and can be accessed anytime in large quantities.

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