Mobile Assessment to Improve Learning Motivation of Elementary School Students in Online Learning

Herwin Herwin, Riana Nurhayati, and Shakila Che Dahalan

Abstract—Online-based distance learning during the pandemic has an impact on the teacher's time to students tends to decrease. This triggers a decrease in students' learning motivation because learning is carried out remotely. This study aims to prove the effect of mobile assessment on the learning motivation of elementary school students in online learning. This study is a quantitative study with a pretest-posttest design. The subjects of this study were elementary school students in Class V. The sample used was 53 students. The selection of research subjects is based on a random sample technique. The research data were collected through a questionnaire designed to measure students' learning motivation. The data collected from both groups were analyzed using paired sample t-test. This study concludes that mobile assessment has a significant positive effect on the learning motivation of elementary school students in online learning. There is an increase in students' learning motivation after the application of mobile assessment in learning activities in online classes.

Index Terms—Elementary school students, learning motivation, mobile assessment.

I. INTRODUCTION

During the COVID-19 Pandemic, all sectors experienced enormous changes and one of them was the education sector [1], [2]. Almost all face-to-face-based educational activities were stopped and switched to online activities to avoid the dangers of the pandemic [3]–[7]. This situation is a challenge for the educational process in the field. Especially for teachers who are actors who implement the learning process for their students. It must be admitted that the initial situation created panic and doubts about how they continued to deliver the subject matter in the midst of a very significant change in situation.

The beginning of the transition from face-to-face learning in schools to distance learning had a shocking effect on various education actors such as students, teachers and even parents. This situation has an impact on student motivation which is decreasing to take part in unusual learning. Even though they are faced with various changing situations, teachers must continue to innovate for the learning process. The teacher is the person who plays the most role in thinking about the learning framework that must be carried out on his students in an unusual changing learning climate. This is very important because the success of learning activities is largely determined by the role and innovation of the teacher [8]–[10]. For reasons of social distancing, it is necessary to innovate a distance learning system that is carried out from the homes of both teachers and students.

Changes in the learning system must of course be followed by changes in the assessment method. Educational institutions must make changes and adjustments to assessment methods to meet the learning methods used [11]. In distance learning situations, traditional assessment should be abandoned so that the assessment activities implemented should reflect online learning and give students more responsibility for their learning [12]–[14].

Distance learning during the COVID-19 pandemic has an inconsistent impact on student learning motivation. This should be a concern for all groups including teachers, parents and schools. Some students were found to have decreased motivation in online learning [15]. Generally, the decline in student motivation in learning is influenced by instrumental support, a less attractive learning environment, and learning time which in turn has an impact on learning achievement [16], [17].

This is supported by several facts found in the field that since the change in the learning system to online-based distance methods, students' motivation to learn tends to decrease. The fulfillment of student learning activities every day seems modest. It was even found that students were less concerned about some of the learning activities designed by their teachers. When dealing with online devices, they prefer to play online games compared to participating in learning activities. This certainly has an impact on decreasing student acceptance and understanding of the material they must master.

In addition to challenges, online learning also presents opportunities to generate student motivation. In online learning, interactions can be dominated by virtual online between teachers and students and interactions between students and students so that it has the potential for them to share as much information as possible [18]. Therefore, it should be noted that distance learning that is integrated with online networks also has the potential to provide motivational support for student learning activities. If learning activities are arranged according to the needs and characteristics of children, then opportunities to increase children's motivation in learning can be realized.

Basically, this research is based on the perceived gaps during distance-based online learning, namely there is no way to conduct student assessments that encourage learning activities and motivation even though it is carried out remotely and can still be accounted for with valid results. Mobile assessment appears this research is based on several

research guidelines and previous findings which state that an assessment that is integrated with mobile provides potential that can be utilized by teachers in conducting quality assessments and learning [19]–[21]. In addition, assessment applications that utilize mobile phones are considered to have a very strong relevance to distance learning such as during a pandemic [7], [22], [23].

This study discusses the use of mobile assessment as an effort to increase student motivation in learning. The mobile assessment in question is an assessment based on the Quizizz Application which is run on the student's mobile phone. As an online quiz application, Quizizz can increase students' positive attitudes in learning [24]. Furthermore, this online quiz-based application is very suitable for the characteristics of elementary school students who have an interest in online game activities.

Learning success can be achieved through the application of appropriate learning technologies to overcome the challenges of learning productively [25]. This is in line based on the view that the diversity of online media is one of the efforts in realizing active learning [26]. Furthermore, teachers must design their learning activities to apply online technology as support for distance learning [27]. This is very much needed because one of the responsibilities of teachers today is to integrate technology in their learning activities [28]. This study aims to prove the effect of mobile assessment on student motivation in elementary school.

II. METHOD

This study is a quantitative study with a pretest-posttest design. The subjects of this study were elementary school students in Class V. The sample used was 53 students. The selection of research subjects is based on a random sample technique. Mobile assessment developed using the Quizizz Application. The content developed in the mobile assessment comes from Civics material in the form of multiple-choice questions with four answer choices. The following is an overview of the research design that has been carried out.

$$O_1 \ X \ O_2$$

O_1 is students' learning motivation before using mobile assessment. X represents the treatment given to students, namely the application of mobile assessment. O_2 is students' learning motivation after using mobile assessment. Conditions on O_1 and O_2 were compared to conclude the effect of the treatment given.

The research data were collected through a questionnaire designed to measure students' learning motivation. The measurement of motivation focused on five indicators, namely: attention to the lesson schedule, attendance at online meetings, active encouragement in discussion activities, willingness to do assignments, and encouragement to participate in assessments. The data of this study were analyzed using descriptive statistical analysis and inferential statistics. Descriptive analysis was carried out by explaining the size of the data spread and inferential analysis was carried out by paired sample t test. Before performing the inference analysis, it is ensured that the data has met the assumptions of parametric requirements, namely using an interval scale and the data is normally distributed.

III. RESULTS

This research is focused on the use of mobile assessment in learning activities in elementary schools. Basically, this mobile assessment is a learning assessment tool that utilizes an online quiz application, namely Quizizz. The selection of this application is based on the fact that generally students who take lessons rely on mobile phones as a medium of learning. In addition, the use of this application is also based on the characteristics of elementary school students who generally like to play games. The selection of this mobile assessment application was developed by combining the nuances of learning assessment and the nuances of playing games which are expected to attract the attention of students to participate in learning activities. Fig. 1 presents an example of a mobile assessment screen used in learning activities.
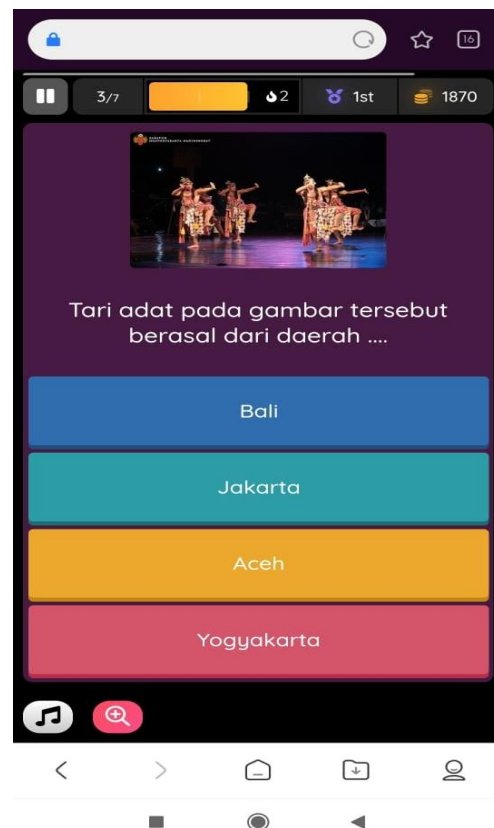

Fig. 1. Example of a mobile assessment screen.

Fig. 1 shows one of the situations experienced by students when participating in learning activities by applying mobile assessment. This situation shows that this application process is run on the student's mobile phone. At the time of its implementation, it appears that this application can run on all types of student mobile phones. This shows that this application is easier to run on any type of mobile phone.

Based on the purpose of this study, the main data that becomes the unit of analysis is data on student learning motivation. The student learning motivation data is grouped into two groups, namely student learning motivation data before using mobile assessment and the other group is student learning motivation data after using mobile assessment in learning activities. These two groups of data were then analyzed to obtain an overview and draw conclusions regarding the effect of mobile assessment on

students' learning motivation.

The first data was obtained from the measurement of students' learning motivation before the implementation of mobile assessment in learning activities. After data collection, descriptive statistical data were obtained which showed that the lowest score was 10 and the highest score was 23. The average score obtained was 18.1 with the median 19, the mode 19, the standard deviation of 3.31 and the variance 11. The trend of the data presented in Fig. 2.
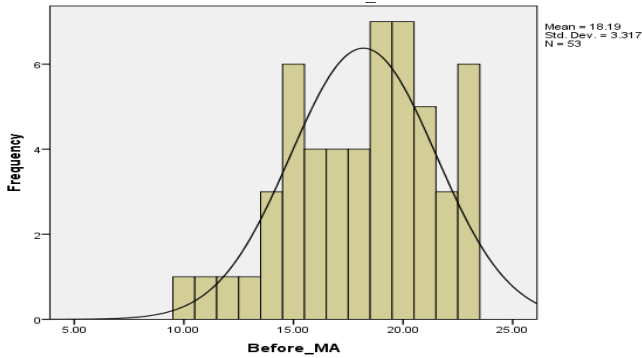

Fig. 2. Distribution of data results before using mobile assessment.

Fig. 2 shows that the trend of data distribution is centered on point 18. This point is the area where the average score for the money data is obtained. The next group of data was obtained from the measurement of students' learning motivation after the implementation of mobile assessment in learning activities. After collecting data, descriptive statistical data was obtained which showed that the lowest score was 16 and the highest score was 25. The average score obtained was 21.2 with the median being 21, the mode 23, the standard deviation 2.04 and the variance 4.1. The trend of the data is presented in Fig. 3.
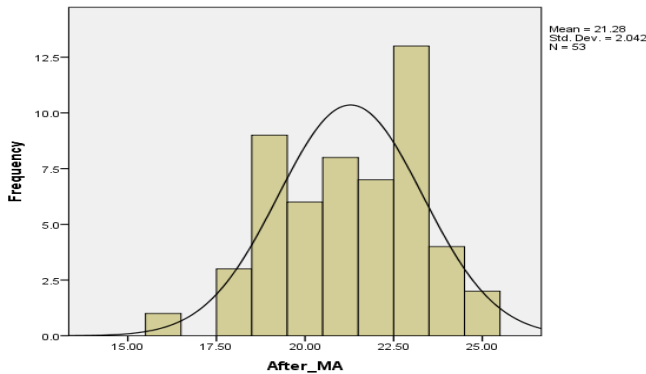

Fig. 3. Distribution of data results after using mobile assessment.

Fig. 3 presents different information from the previous data. In this presentation, it can be observed that the distribution of data is more centered on point 21. This shows the area of the average data score. If you observe the tendency of the two groups of data, it can be explained that descriptively students' learning motivation shows better results after applying mobile assessment in learning activities.

The next test is inferential testing. This proof is done by comparing the data from the two groups. This test is carried out using paired samples test. This is intended to prove that there is a significant effect of the application of mobile assessment on students' learning motivation. In general, the

results of this test are presented in Table I.

TABLE I: PAIRED SAMPLES TEST RESULTS

Paired Differences	Scores
Mean	3.09434
Std. Deviation	3.21812
Std. Error Mean	0.44204
Lower (95% Confidence Interval)	2.20732
Upper (95% Confidence Interval)	3.98136
t-value	7
df	52
Sig. (2-tailed)	< 0.001

Table I shows the results of testing the differences between the two groups. In these results, information is obtained, namely a t-value of 7 with a p-value (Sig) less than 0.001. Statistically these results indicate that there is a significant difference between the two groups. If referring to the results of the previous descriptive analysis which stated that learning motivation after implementing mobile assessment showed better results, then the results of this paired sample test strengthened this conclusion significantly.
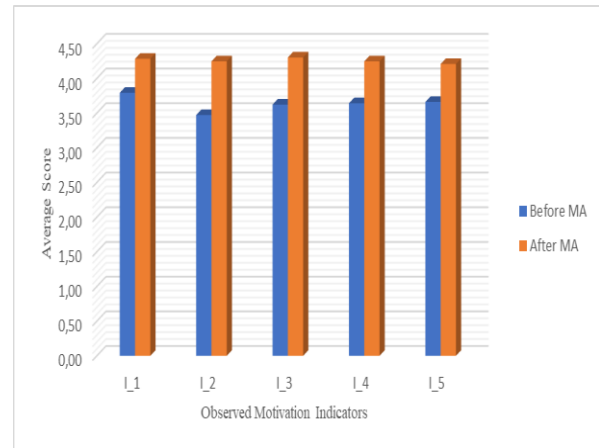
Description of Indicators:
I_1: Attention to the lesson schedule.
I_2: Attendance at online meetings.
I_3: Active encouragement in discussion activities.
I_4: Willingness to do assignments.
I_5: Encouragement to participate in assessments.
Fig. 4. Comparison of student motivation based on measuring indicators.

The results presented in Fig. 4 show that all the motivation indicators measured in this study showed an increasing trend in the data after implementing the mobile assessment. Basically, the increase that occurs is relatively the same. However, if you look at the pictures in detail, the thing that has improved the most after the implementation of mobile assessment is the willingness of students to attend every meeting. This is certainly a very positive thing for learning activities. Thus, in general, the application of mobile assessment in learning activities has a positive impact on students' learning motivation.

IV. DISCUSSION

The findings of this study indicate that the integration of mobile technology in learning activities is very helpful in the implementation of distance learning. Significant changes in the situation due to the COVID-19 pandemic have forced all face-to-face learning activities at schools to be moved to their respective homes. This situation forces the teacher to deliver

the subject matter from a distance. Online learning is the most appropriate choice to overcome this limitation.

The pandemic situation has an impact on most human activities have been shifted to digital media, including learning activities [29]. This is supported by findings which state that online classes are an effective effort to keep classes active even though schools have been [30]. The integration of mobile technology in applied learning activities also has a fairly strong basis for consideration. The hope for these considerations is that education and students are expected to have the impetus to improve their mastery of technology [29].

The development of internet technology, support for wireless communication capacity and the number of mobile devices (e.g., smartphones and tablets) provide new possibilities and challenges in the field of mobile learning [31]–[33]. This is very important because ideally an education organization must also follow technological developments. On the other hand, currently most people from various circles have standard mobile phone devices to support learning. Therefore, mobile learning innovation is something that should be considered to support online learning.

Various technological tools have been presented to provide convenience to humans, including in learning activities [28], [34], [35]. Mobile technology has been recommended in learning activities [36], [37]. Even some findings have proven that mobile learning affects students' academic achievement [38], [39]. Some of these findings become a strong basis for implementing mobile technology in student learning activities.

The findings of this study integrate mobile technology in the implementation of learning assessments. Using the Quizizz application, this research applies mobile assessment to increase the learning motivation of elementary school students. The selection of mobile assessment is certainly based on all students having a mobile phone in their home so that the assessment process will not have significant disturbances because cellular technology has become familiar to the public at this time [40]–[44].

The selection of the Quizizz application is based on the suitability of this application with the characteristics of elementary school-aged children. One of the advantages of this application is that it has the feel of a competition game. This is considered very suitable for children's enjoyment in general. Various findings have proven the benefits of games on children's learning. If the game is applied proportionally, it will increase children's motivation [45]–[47]. Games are very useful as a source of recreation and a trigger for increasing children's motivation in learning [48].

Gamification in learning has been widely applied for the successful achievement of learning objectives. Gamification is often used to increase student participation and motivation in learning [49]. Quizizz is an application that has a gamified construction that is suitable as a learning medium. This application has attracted the attention of many teachers who apply it in their classrooms to increase student participation and learning motivation [50], [51].

This study has received support from several previous findings which state that mobile learning has many benefits in primary learning activities [52]–[55]. Currently, the features of mobile devices are very developed to be applied in learning activities [52], [56], [57]. Especially in the assessment aspect, mobile assessment is here to overcome the various weaknesses of paper and pencil-based assessment activities [58]–[60]. Especially in the current pandemic situation, mobile assessment is very promising to solve the problem of space and time between teachers and students. Assessment becomes more flexible [61]. All assessment activities can be carried out in any space even at any time without limits. This is very important because the teacher holds the key to learning strategies to facilitate student learning [62].

Several previous studies that have discussed the role of assessment that are integrated with mobile phones have relevance to the findings of this study. However, this study shows the novelty that mobile assessment does not only provide benefits for improving learning outcomes but can shape students' affection in a better direction by triggering enthusiasm for learning and encouraging students to be involved in the learning process. It is considered as a novelty of this finding to be a reference and consideration in future studies.

The findings of this study have proven that mobile assessment has increased students' learning motivation. If observed in detail, all the components of the measured motivation indicators have increased during the implementation of this mobile assessment. During this process students have had high attention to the lesson schedule. In addition, students have shown enthusiasm to attend online meetings. More than that, students feel they have an incentive to participate in discussion activities, are active in doing assignments, and are encouraged to participate in assessments. The findings empirically have shown that mobile assessment has a positive impact on the learning motivation of elementary school students.

V. CONCLUSION

This study concludes that mobile assessment has a significant positive effect on the learning motivation of elementary school students in online learning. There is an increase in students' learning motivation after the application of mobile assessment in learning activities in online classes. This is evidenced by an increase in students' attention to learning, the willingness of students to be present and active in learning activities. In addition, the willingness of students to do assignments and participate in assessments is getting better. Therefore, mobile assessment is very suitable to be applied to online learning during a pandemic.

The findings of this study recommend the advantages of mobile assessment during online learning. For this reason, teachers are expected to consider and implement this application because it is very useful for increasing students' learning motivation in online-based distance learning. In addition, the development and implementation of mobile assessments is relatively simple and various instructions are widely available on social media such as YouTube, google and others so that they are easy to apply.

This research shows implications that can be felt directly

by both the researcher and the users and research targets. The first implication is that with mobile assessment, online student learning activities have improved better with increasing student motivation in learning. The second implication shows that student learning outcomes in general show a very positive thing due to the higher motivation to learn after the use of mobile assessments. The next implication is that the learning climate in the classroom becomes conducive even though it is done remotely.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Herwin Herwin found the main topic, compiled a proposal, conducted research and drew conclusions from the research findings. Riana Nurhayati developed mobile assessment content, verified data and reviewed manuscripts. Shakila Che Dahalan analyzed the data obtained from the field.

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