Practicality of Digital Classroom on Mathematics Learning for Elementary School Students

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ABSTRACT

This research is motivated by the development of a digital classroom model in mathematics learning, and it is necessary to know the practicality of the digital classroom model. The purpose of this study was to determine the practicality of the digital classroom model in mathematics learning from the student aspect. This research is descriptive qualitative research using questionnaires. This questionnaire consists of five aspects that are observed, namely students' attitudes towards digital classroom learning, student interest in digital classroom learning, the relationship between the digital classroom model and student learning outcomes, student attitude towards schoology social learning network, and the relationship between schoology, social learning network, and student learning outcomes. The results of this study indicated that the final value of the practicality test of the digital classroom model in mathematics learning is 89.93 with a very practical category. This study concluded that the digital classroom model is very practical to use in mathematics learning in elementary schools. The implication of this research is to be a reference in the development of other digital classroom models.

Keywords: *Digital classroom practicality, Elementary school, Mathematics learning.*

1. INTRODUCTION

Mathematics is one of the subjects studied from elementary to higher education [1]. Mathematics learning in elementary schools can be done conventionally or through digital learning. In conventional learning, the learning process is carried out in classrooms at school with face-to-face learning. Teachers and students are in the same classroom and interact directly in the learning process. While in digital learning, learning is carried out using learning platforms and applications that can be accessed online. The interaction between teachers and students in digital learning is done online. Digital learning requires the integration of technology into the learning process [2].

Mathematics is basic science and the foundation of modern technology and knowledge, besides mathematics gives a person high skill in terms of abstraction power, problem analysis, and logical reasoning. Problems arising in the agricultural, industrial, economic, and health sectors can also be solved with mathematical approaches, the rapid development of information and communication technology in the fields of number theory, algebra, analysis, probability theory, and discrete mathematics [3].

One of the problems in education that need immediate solutions is the quality of learning [4-5]. Improving the quality of learning can be done by developing student-oriented learning and facilitating students' needs for education. Student-oriented learning can be done by building a learning system that allows students to have the ability to study longer and varied. Students need to study other subjects to enhance their knowledge and insight into the future.

One learning model that can meet their learning needs is the digital classroom learning model. With digital classroom learning, students can access the material they need anytime and anywhere. The integration of technology in the learning process will create a meaningful and interesting learning experience for students [6]. The results of [7] show that well-prepared digital learning can encourage students' mathematical thinking and understanding abilities to increase. In line with this, the research results of [8] also show that the use of technology in learning mathematics can also improve student achievement. Through the digital learning platform, students can learn math material with various media such as learning videos, animations, ICT-based teaching materials, edugames and so on. Digital learning can also encourage students to develop their abilities in terms of mastering technology. Therefore,

this digital learning needs to be developed in learning mathematics in elementary schools.

One of the digital classrooms learning models that are very appropriate to use is the Schoology. Schoology is an online learning media that provides facilities for learning, which consists of attendance for students, courses for classifying class subjects, resources for adding material, assignments, quizzes, discussion rooms, etc. [9]. Another online learning platform that can be used in digital classroom learning is Edmodo. The advantage of schoology compared to edmodo is that it provides more features such as courses, groups, and learning resources [10]. In addition, schoology also provides additional features such as stay connected, extend class time, manage on the go, leverage iOS and android devices schoology [11]. The features provided by schoology can be used in learning mathematics in elementary schools.

One of the main advantages of online learning is flexibility. They can access learning virtually anywhere with internet access [12]. Each student can adjust when and for how long they want to participate, depending on their daily commitment. Besides, students will save time and transportation costs to study locations [13]. Therefore, it is necessary to develop a digital classroom model for elementary school students in mathematics learning.

In previous research, a digital classroom model for elementary school students in mathematics learning has been declared valid and suitable for use [14]. However, a learning model is not only seen from its theoretical feasibility but also the practicality of its implementation. So further examination is needed regarding the practicality of the digital classroom model. In this research, the practicality of the digital classroom model is examined from the students' aspects. Therefore, the purpose of this study is to determine the practicality of the digital classroom model for elementary school students from the aspects of students during mathematics learning.

2. METHODS

This research is descriptive qualitative research. The subjects of this research were elementary school students in the city of Bukittinggi. The research instrument used was a questionnaire distributed online. The questionnaire used consists of five aspects, namely students' attitudes towards digital classroom learning, student interest in digital classroom learning, the relationship between the digital classroom model and student learning outcomes, student attitudes towards schoology social learning network, and the relationship between schoology social learning network and student learning outcomes. Research data obtained from practicality questionnaires were converted into numbers using a Likert scale in Table 1.

Table 1. Practicality Test Assessment Score Scale

Alternative Answer	Statements	
	Positive	Negative
Strongly Agree (SA)	4	1
Agree (A)	3	2
Disagree (D)	2	3
Strongly Disagree (SD)	1	4

The data analysis technique is finding the final value using a formula:

$$P = \frac{F}{N} \; X \; 100\%$$

Description
P = Percentage of assessment
F = Value obtained by research subject
N = ideal value

With the following interpretation:
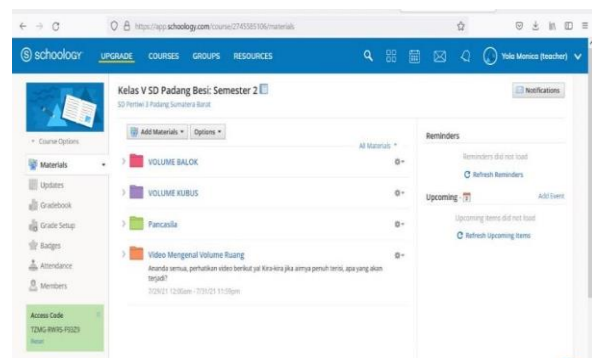0% - 20% : very impractical
21% - 40% : impractical
41% - 60% : quite practical
61% - 80% : practical
81% - 100% : very practical

3. RESULTS AND DISCUSSION

The implementation of digital classes is carried out using the Schoology application. Schoology is easily accessible to students. The following is a display of the schoology platform used in this study.

Figure 1 Display of the schoology platform.

Teachers can manage assignments, and quizzes to be given to students, so students can access them easily on the schoology platform. In this digital classroom, there are various materials and videos for learning mathematics that students need. Here is one display of mathematics learning materials that students can learn through the schoology platform.
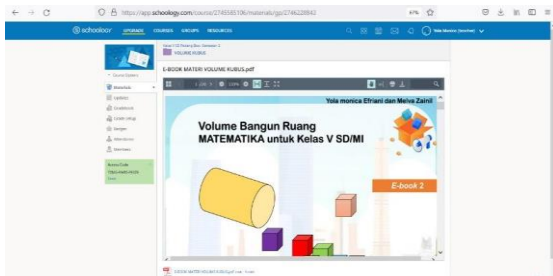
Figure 2 One of the mathematics learning materials in schoology.

In addition to providing space to distribute learning materials, assignments, and quizzes to students, the Schoology platform also provides space for discussion and facilitates the process of checking student attendance. To find out the practicality of digital learning using this schoology application, a questionnaire was distributed to students. The distribution of questionnaires was carried out after the developed digital classroom model was applied in elementary schools. The questionnaire used is adjusted to the grid as follows:

Table 2. Questionnaire grid

No	Types of Learning	Aspects Observed	Statement	Nature of Statement	Number of Statement
S1	Model Digital Class	Students' attitudes towards digital classroom learning	Learning mathematics using a digital classroom model that was carried out by the teacher helped me understand the subject matter easily	Positive	1
			The general description explained by the teacher at the beginning of the lesson helped me to know the outline of the material and the learning objectives	Positive	2
			I do not need to answer the questions asked by the teacher because it will not affect my knowledge of the material being taught	Negative	3
			During group discussions or presentations, I just have to be silent and don't have to give any response	Negative	4
		Student Interest in digital classroom learning	By doing presentation activities in front of the class, I can practice my speaking skills	Positive	5
			I often have to express my opinion in both discussion and presentation activities	Positive	6
			I just need to take part in teaching and learning activities in class without having to care about what results I have to achieve after the learning.	Negative	7
			Learning in groups will only make me feel uncomfortable.	Negative	8
		The relationship between the digital classroom model and student learning outcomes	After doing lessons in class, I am more proficient at understanding math problems and solving them	Positive	9
			From the start, I already knew how to present data through pictures, tables and diagrams so I no longer needed to pay attention to the teacher's explanation about this	Positive	10
2	Schoology Learning	Student Attitude Towards Schoology Social learning network	Learning with Schoology social learning network helps me understand math material more deeply	Positive	11
			By learning using Schoology's social learning network, I discovered new knowledge that I had not gotten from classroom learning	Positive	12
			By learning using Schoology's social learning network, I get the opportunity to study mathematics anywhere and anytime without being limited by time	Positive	13
			If I experience difficulties, I just need to wait for the answer to the questions given by the teacher instead of having to find a solution	Positive	14

No	Types of Learning	Aspects Observed	Statement	Nature of Statement	Number of Statement
			I don't need to regularly visit Schoology's social learning network	Negative	15
			Learning with the Schoology social learning network is held solely to get added value from the teacher	Negative	16
			Being able to interact well with friends and teachers without feeling reluctant made me enthusiastic about participating in learning with the Schoology social learning network	Positive	17
			I assumed that my teacher would not mind if I did not take part in mathematics learning sessions with the Schoology social learning network	Negative	18
		The relationship between Schoology social learning network and student learning outcomes	The teaching materials displayed through the Schoology social learning network made me better understand the material	Positive	19
			Doing practice questions with Schoology's social learning network will only waste my time	Negative	20

Then after the questionnaire is made based on the grid, the questionnaire is distributed to the students. Next, the scoring is carried out. The summary of the practicality test of the student aspects is as follows:

Table 3. Practicality test results

NO	STATEMENT	SCORE	PERCENTAGE
1	Learning mathematics using a digital classroom model that was carried out by the teacher helped me understand the subject matter easily	66	88%
2	The general description explained by the teacher at the beginning of the lesson helped me to know the outline of the material and the learning objectives to achieve	67	89.33%
3	I do not need to answer the questions asked by the teacher because it will not affect my knowledge of the material being taught	66	88%
4	During group discussions or presentations, I just must be silent and don't have to give any response	67	89.33%
5	By doing presentation activities in front of the class, I can practice my speaking skills	67	89.33%
6	I often have to express my opinion in both discussion and presentation activities	67	89.33%
7	I just need to take part in teaching and learning activities in class without having to care about what results I must achieve after the learning.	65	86.67%
8	Learning in groups will only make me feel uncomfortable.	68	90.67%
9	After studying in class, I am more proficient at understanding math problems and solving them	73	97.33%
10	From the start, I already knew how to present data through pictures, tables, and diagrams so I no longer needed to pay attention to the teacher's explanation about this	66	88%
11	Learning with Schoology social learning network helps me understand math material more deeply	67	89.33%
12	By learning using Schoology's social learning network, I discovered new knowledge that I had not gotten from classroom learning	72	96%
13	By learning using Schoology's social learning network, I get the opportunity to study mathematics anywhere and anytime without being limited by time	68	90.67%
14	If I experience difficulties, I just need to wait for the answer to the questions given by the teacher instead of having to find a solution	72	96%
15	I don't need to regularly visit Schoology's social learning network	68	90.67%
16	Learning with the Schoology social learning network is held solely to get added value from the teacher	67	89.33%
17	Being able to interact well with friends and teachers without feeling reluctant made me enthusiastic about participating in learning with the Schoology social learning network	65	86.67%

NO	STATEMENT	SCORE	PERCENTAGE
18	I assumed that my teacher would not mind if I did not take part in mathematics learning sessions with the Schoology social learning network	65	86.67%
19	The teaching materials displayed through the Schoology social learning network made me better understand the material	67	89.33%
20	Doing practice questions with Schoology's social learning network will only waste my time	66	88%
Score obtained		1349	
Maximum score		1500	
Final score		89,93	89.93%
Category		Very Practical	Very Practical

From the table above, it can be seen that the final percentage of the practicality test from student aspects is 89.93. Each statement on the questionnaire obtained a percentage of more than 85% with the lowest percentage being 86.67% and the highest percentage being 97.33%. The average percentage of the entire questionnaire was 89.93%. In accordance with the predetermined percentage classification, it shows that the results of the practicality test of the digital classroom model from the student aspect are in the very practical category. This proves that the learning model developed is categorized as very practical from the student's aspect.

This practicality is very practical because the digital classroom model is developed by considering the convenience of students. The digital classroom model aims to make students understand the learning material easily. This digital classroom model is also provided with modules and student worksheets to make students easily follow each learning process. Besides, the learning model developed also pays attention to the situations and conditions of students so that students feel comfortable using this learning model. This is because a learning model is easily implemented by students so that students can achieve maximum learning objectives [15-16]. Learning objectives will be achieved if each process is following the planning that has been designed [17-18]. Therefore, this digital classroom learning model aims to make students easily implement it.

This digital classroom learning model pays attention to student interest and motivation. This learning model was developed by considering the development of Industry 4.0 as a technology-based era. Technology for elementary school students is not extraordinary [19]. In the present era, elementary school students have a high interest in technology. Therefore, the digital classroom model can attract elementary school students. Besides, this digital classroom model is also developed with technological assistance to increase student motivation to learn mathematics. This is because the learning model must be able to increase student interest and motivation in learning [20-22]. If students are interested and

motivated to learn, it will have an impact on the quality of mathematics learning.

Also, this digital classroom model pays attention to the learning objectives that must be achieved by students. This digital classroom aims to help students easily understand the material presented so that it can impact the quality of learning. This digital classroom is structured and also facilitated with teaching materials and worksheets so that students can achieve maximum learning goals. As stated that a good learning model is a learning model that can achieve maximum learning objectives [23-24]. So these factors make this digital classroom model considered very practical by elementary school students.

4. CONCLUSION

This practicality is very important because the digital classroom model was developed with the convenience of students in mind in the classroom. The digital classroom model aims to make it easier for students to understand mathematics learning materials optimally. This digital class model is also equipped with modules and worksheets to make it easier for students to follow each learning process. In addition, the learning model developed also pays attention to the situation and condition of students so that students feel comfortable using this learning model. The results of this study indicate that the final value of the practicality test of the digital classroom model from the student aspect is 89.93 in the very practical category. Each statement on the questionnaire obtained a percentage of more than 85% with the lowest percentage being 86.67% and the highest percentage being 97.33%. The average percentage of the entire questionnaire was 89.93%. This shows that the digital classroom model is very practical for use in mathematics learning in elementary schools. Based on these results, we support the development of a digital classroom model in learning mathematics in elementary schools.

AUTHORS' CONTRIBUTIONS

Yullys Helsa: data analysis, conducting experiment. Dadang Juandi: review manuscript and supervisor. Darhim: review manuscript and supervisor; and Turmudi: review manuscript and supervisor.

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