

Development of Quizizz Application E-Module-Based Teaching Materials on Student Mathematics Learning Outcomes

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Article Information

Article History:

Received May 24, 2023

Revised June 21, 2023

Published June 30, 2023

DOI:

[10.58557/eduinsights.vxix](https://doi.org/10.58557/eduinsights.vxix)

Keyword:

Teaching Materials

E-Modules

Quizizz

Mathematics Learning

Outcomes

ABSTRACT

Teaching materials have an important role for the continuation of learning so that student learning outcomes are more optimal. Teachers must create a learning media and teaching materials that of course so that students feel interested and active during learning. During a pandemic like this, online learning is certainly not effective if the use of print-based teaching materials is carried out, due to the limited communication between students and teachers. One of the teaching materials that can be sought to improve student learning outcomes is E-Module-based teaching materials with the Quizizz application. The population is all students of Class VII of SMP Negeri 2 Sumber for the 2021/2022 school year. Samples in this study. The class used is class VII G as the control class and VII I as the experimental class. The instruments used are tests and questionnaires. The results of this research are: Based on the validation results from material experts and media experts that the development of e-module-based teaching materials with the quizizz application is suitable for use as mathematics teaching materials and Students' mathematics learning outcomes increase after the provision of e-module teaching materials with the quizizzi application in the learning process.

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1. INTRODUCTION

Quality human resources (HR) is a very important asset in life. Especially for students, who will become the golden generation and become the seeds of Indonesia's progress. Differences in the quality of one's human resources can be seen from differences in mastery of science, technology, and skills. High quality human resources can master various fields of life such as education, politics, economics and so on. On the other hand, low human resources cause the younger generation to experience a decline in their lives (Munir, 2009). Therefore, besides students are required to master

science, they are also required to master technology and have great skills. So that students become good people in their lives in the future.

Talking about science, mathematics is a science that has an important role in the development and progress of a technology. besides that mathematics is also a universal science, namely the knowledge of various sciences that can make human thinking develop and progress (Meidawati, 2014). But in reality, students have always considered mathematics as a subject that is difficult to understand and has become one of the subjects students are afraid of. The majority of students only rely on rote memorization of formulas in working on math problems. It will not mean anything, if a subject, especially mathematics, only relies on memorization, but also requires an understanding of a concept and theory of the subject matter.

In the learning process, teaching materials are used by the teacher as a reference source that students can use to gain knowledge apart from the information conveyed by the teacher. Mathematics is an important part of science and technology, needed by everyone as a means of thinking, because it will provide benefits and convenience in carrying out daily activities. Mathematics is a subject that occupies an important role in the education (Wahid & Izzati, 2022).

Regarding the understanding of a concept and theory of a mathematics subject matter, students also need motivation and guidance from the educator. The teacher must succeed in making students motivated and self-motivated, so that a good learning process can be carried out. According to Weinstein and Meyer, "good learning is teaching students how to learn, remember, think, and motivate." (Suprihatiningrum, 2016). The teacher provides guidance either orally or in writing. However, it is more effective for students to be guided in writing with a teaching material, so that they can be helped by the existence of an effective teaching material which makes them read and understand repeatedly. E-Module is an alternative in learning that is suitable for students because of its use, which is to assist students in adding insight and information about an understanding of concepts learned with systematic learning activities. Besides that, in the design of teaching devices there is no comprehensive development, it is based on problems from teachers (Widodo & Wahid 2020).

In this day and age all aspects are progressing and developing very rapidly, especially in science and increasingly sophisticated technology. It doesn't feel difficult to make a learning process that is fun and interesting in the present. The learning process is created in an interesting and fun way, of course by utilizing a science of technology, such as making teaching materials that are useful in the continuity of the supporting learning process. Students' perceptions of technology-based learning are getting better which is beneficial for the learning process (Udin, Maufur & Riyanto, 2022).

All over the world, including in Indonesia, are currently trying to restore conditions to normal. The reason is that at the beginning of 2020 Indonesia was being hit by the Covid-19 outbreak which required all aspects to stop temporarily, including the education aspect. In Indonesia, the education system at the time of the Covid-19 pandemic was not running as usual, namely requiring students to study at home and not having to study at school. In this case, educators and students are limited in space and time. Even in a pandemic, they are still learning by making the most of information and communication technology. Teachers and students carry out online learning which is then carried out remotely as well.

At first the main learning media for distance learning were only in the form of modules, but with the development of information and communication technology, learning media emerged in the

form of computers, audio, video, non-print media, multimedia, internet and others. Online learning is never separated from mobile phones, laptops, tablets which support learning and communication as well as internet access as a complementary means. In conditions like this, of course the teacher must be very clever in creating fun learning strategies even though it is carried out remotely and communication between students is also carried out remotely. Teachers must create learning media and teaching materials which of course must make students feel interested and active when learning online.

The Quizizz application is an application that supports the continuity of online learning. The Quizizz application is a learning medium that is very useful for its users, especially teachers and students who are learning from home only. This application can be used as a delivery of material and also as a very fun and interesting learning evaluation tool. This is because this application is a game application or game application that is flexible, besides that teachers can easily use it in developing an evaluation media with this application, so that the objectives of a lesson including mathematics subjects can be achieved.

But in reality, students often do not make the most of information and communication technology in online learning because students' interest is so lacking. This is in accordance with the research developed by Lisa Tania and Joni Susilowibowo in their research entitled "Development of E-Module Teaching Materials as Supporting 2013 Curriculum Learning on Journal Entry Material for Adjustment of Service Companies for Class X Accounting Students of SMK Negeri 1 Surabaya" in their research stated that e -The developed module is suitable for use as teaching material in the school. However, the e-module has not been able to attract students' interest in learning because it is still too boring and not creative enough. Therefore students tend to be less active in the learning process.

To increase student interest and learning outcomes, it is necessary to have a very serious action, namely by changing an interesting and fun learning process. What's more, students think mathematics is a very difficult subject, because it is so difficult that students feel bored.

During a pandemic like this, online learning is of course ineffective in using print-based media due to limited communication between students and teachers. In mathematics lessons when face-to-face learning takes place, print media such as math textbooks and modules are used. However, in the current condition, teachers must be good at using and even have to be able to develop a very advanced technology like today, for example in the development of e-module-based teaching materials with the Quizizz application.

With the problems above, it can be concluded that during online learning there are still many students who do not match the expected achievements. This is because the teaching materials used during online learning are still not optimal and not interesting, so learning still feels boring and not fun. With the hope that students can learn in a fun and interesting way so that students can learn easily, therefore researchers will develop an interesting teaching material for students. Thus this researcher entitled "Development of Quizizz Application E-Module-Based Teaching Materials on Student Learning Outcomes". Researchers hope that this research can attract students in fun learning, so that students can be active in participating in a lesson.

This study aims to: 1) To find out how the feasibility of e-modules with the quizizz application on students' mathematics learning outcomes, 2) To find out student learning outcomes after using e-module teaching materials with the quizizz application, 3) To find out student responses after using e-module teaching materials with the quizizz application.

Teaching materials are learning materials that are designed systematically and attractively, learning methods, methods, limitations, and evaluations to achieve the expected goals, namely to acquire abilities or some abilities in all complexities. A device or learning tool that includes a method. Teaching materials are all forms of materials (written materials or unwritten materials) used by teachers in carrying out teaching and learning activities in Hamid's class (Hamid, 2013). Teaching materials are learning components that are used by teachers as teaching materials for students and assist teachers in carrying out teaching and learning activities in the Mangesti class (Mangesti, 2020).

Multimedia is a media for conveying or presenting computer-assisted content or information either with static visualization or Supuwingsih animated visualization (Supuwingsih, 2021). As an educational medium, multimedia is a tool, method and approach used to create communication between the teacher and the learner during the learning process, so that it becomes more interesting for Munir (2009).

According to Raharjo (2017) media or learning aids are made with the aim of increasing independent learning, but for good results the choice of interesting, effective and interactive learning media is a problem that must be found a solution. In Latin, namely *medius* which literally means "middle", "intermediary" or "introduction".

The electronic module is a teaching material that contains material, methods and ways of evaluating designed in an interesting and systematic way to achieve the expected competency goals. According to Wijayanto, an electronic module or e-module is an information display and book format that is presented electronically using a hard drive, diskette, CD, or flash drive and can be read using a computer or Priyanthi's electronic book reader (Priyanthi, 2017).

Quizizz Apps is an Indian educational software company headquartered in Bengaluru, India, that builds and sells gamified student engagement platforms. The Quizizz application is an educational game application that is narrative and flexible in nature which can be used to deliver material as well as an interesting and fun learning evaluation medium (Ulhusna, Dewimarni & Rismaini, 2021).

Learning is a process of maturing students, with an active process of interaction between educators and students as the implementation of learning. The teaching and learning process is an activity of teacher-student interaction and reciprocal communication that takes place in evocative situations to achieve learning goals. Interaction and reciprocal communication between teacher-students are the main characteristics and requirements for the ongoing teaching and learning process (Legendari & Raharjo, 2016).

2. METHOD

In this study, the population was all Class VII students of SMP Negeri 2 Sumber on Jalan Pangeran Kejaksaan, Babakan Village, Sumber Cirebon District who were registered as active students at the school during the time this research was conducted. In this research, including the type of development research (Research and Development). To be able to produce certain products, research that is in the nature of needs analysis is used and to test the effectiveness of these products so that they can function in the wider community, research is needed to test the effectiveness of these products Sugiono (2017). The method in this study uses the ADDIE development model which includes five stages, namely analysis, design, development, implementation, and evaluation.

While the design of this study uses a Quasi Experimental Design experiment using Sugiono's pretest and posttest designs (Sugiyono, 2017). With two groups selected, namely the experimental class and the control class. The experimental class was given treatment, namely the use of learning

media assisted by the quizizz application and the control class was not given treatment. The data collection techniques in this study used data collection instruments in the form of questionnaires, tests and documentation.

3. RESULT AND DISCUSSION

In the study, researchers used two instruments, namely questionnaires and tests. Questionnaires and tests have been validated by the validator. The questionnaire, which is a student response questionnaire consisting of 30 statements with 5 indicators, is used to obtain student responses to the use of e-module-based teaching materials with the Quizizz application. And the test consists of 5 questions in the form of descriptions used to measure learning outcomes and the effectiveness of using e-module teaching materials with the Quizizz application in the experimental class, namely the beginning (pretest) and the end (posttest). Before the pretest and posttest were carried out, the tests were tried out first in class VII H of SMP Negeri 2 Sumber and had gone through the stages of testing the validity, reliability, level of difficulty, and discriminating power. This research was conducted in two classes, namely the experimental class in class VII I and the control class in class VII G. The experimental class was the class that was given treatment, namely learning using e-module-based teaching materials with the Quizizz application while the control class was not given teaching materials. The experimental class consisted of 34 students and the control class consisted of 33 students. At the beginning and at the end of the experimental class a pretest and posttest were carried out, then at the end of the lesson a questionnaire was carried out to find out the student's response after using the teaching material.

In addition, researchers also measured the feasibility of e-module-based teaching materials with the quizizz application by material experts and media experts, each with two validators. To measure the level of feasibility of teaching materials, researchers used a validation questionnaire for material experts and media experts.

Tabel 1 Recapitulation of the First and Second Material Expert Assessments

Aspect	Score	Percentage	Categories	Criteria
Fill	110	92%	Very Valid	Very Worth it
Presentation	58	83%	Valid	Worthy
Language	139	93%	Very Valid	Very Worth it
Average		89%	Very Valid	Very Worth it

After carrying out data analysis using Microsoft Excel, the first and second validator material experts in table 1 above obtained an average percentage of 89% in the very feasible category. presentation 83%, and language aspects 93%.

Tabel 2 Recapitulation of First and Second Media Expert Ratings

Aspect	Score	Percentage	Categories	Criteria
Appearance	105	88%	Very Valid	Very Worth it
Use	115	82%	Valid	Worthy
Average		85%	Very Valid	Very Worth it

Based on table 2 above, the first and second validators obtained an average percentage of 85% with a very feasible category for the teaching material to be used with the acquisition of each indicator, namely the display aspect of 88%, the usage aspect of 82%.

Table 3 Statistical Description of Experiment Class and Control Class

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest Experiment	34	52	72	68,15	4,054
Posttest Experiment	34	75	100	85,47	6,850
Pretest Control	33	30	65	57,27	6,355
Posttest Control	33	65	83	71,18	6,485

Based on the analysis of statistical description data in table 3, the average (mean) value for the experimental class is 85.47 while the average (mean) value for the control class is 71.18. So it can be concluded that the average value (mean) of the experimental class is greater than the average value (mean) of the control class.

Table 4 Normality Test

Group		Shapiro-Wilk		
		Statistic	Df	Sig.
Student learning outcomes	Pretest Experiment	0,940	34	0,062
	Posttest Experiment	0,956	34	0,181
	Pretest Control	0,950	33	0,129
	Posttest Control	0,937	33	0,055

From the results of the analysis of the normality test data that the data obtained is normally distributed with the acquisition of sig. in the experimental class of 0.181 and sig. control class of 0.055. From the results of the normality test data, it shows that the significance in both classes is ≥ 0.05 , which means that the data for the two classes are normally distributed.

Table 5 Homogeneity Test

		Levene			
		Statistic	df1	df2	Sig.
Student learning outcomes	Based on Mean	0,211	1	65	0,647
	Based on Median	0,183	1	65	0,670
	Based on Median and with adjusted df	0,183	1	64,936	0,670
	Based on trimmed mean	0,228	1	65	0,635

While the homogeneity test obtained a significance value of 0.647. So, with a significance level of ≥ 0.05 , the data has the same variant value or data from both classes is homogeneous.

Table 6 Experiment Class and Control Class t-test

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Hasil Belajar Matematika	Equal variances assumed	0,211	0,647	7,258	65	0,000	11,834	1,631	8,578	15,091
	Equal variances not assumed			7,264	64,961	0,000	11,834	1,629	8,580	15,088

The results of testing the data analysis with the independent simple t-test in table 6 above obtained a probability value (significance 2 tailed) with the t-test is 0.000. This shows that the probability value is less than 0.05, then H_0 is rejected and H_a is accepted or the development of e-module-based teaching materials with quizizz applications is effective on student mathematics learning outcomes.

Fill in student responses by using a value of five as the maximum value while the value of one as the minimum value or the least. The students studied were the experimental class, because the experimental class was a class that carried out mathematics learning with the help of e-module teaching materials with the Quizizz application.

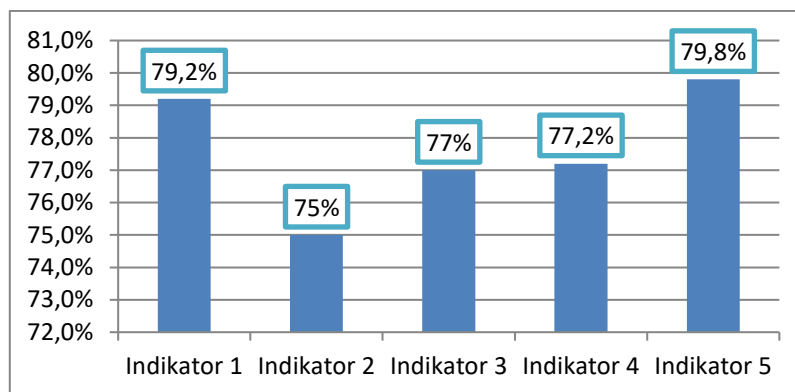


Figure 1 Graph of Percentage of Student Response Questionnaire Indicators

With a total of 34 students and 30 questionnaire responses collected in 5 indicators, it can be seen in Figure 1. The student response was at least 75%, namely in the second indicator, while the highest student response was 79.8% in the fifth indicator. From the results of data analysis, the cumulative average acquisition of the response questionnaire with five indicators obtained 77.6% with good enough criteria. This shows that students' responses to e-module-based teaching materials with the quizizz application are good.

4. CONCLUSION

Based on the validation results from material experts and media experts that the development of e-module-based teaching materials with the quizizz application is feasible to be used as mathematics teaching materials, such as data acquisition from the validation results of the two material expert validators and media experts as follows. Through data analysis using Microsoft Excel, in the assessment of the first and second validator material experts obtained an average percentage of 90% with the appropriate category of teaching materials used with the acquisition of each indicator namely the content aspect of 93%, presentation aspect of 83%, and language aspects 93%. Through data analysis using Microsoft Excel, in the assessment of media experts one and two obtained an average percentage of 85% with the appropriate category of teaching materials used with the acquisition of each indicator, namely in the display aspect by 88%, the usage aspect by 82%.

Students' mathematics learning outcomes increased after being given e-module teaching materials with the quizizz application in the learning process, meaning that the teaching materials were effective in improving student mathematics learning outcomes. This is based on the results of the research hypothesis test, the following data is obtained: Through the normality test that the data obtained is normally distributed with the acquisition of sig. in the experimental class of 0.181 and sig. control class of 0.055. The results of the normality test data show that the significance for both classes is ≥ 0.05 , which means that the data for the two classes are normally distributed as shown in table IV-14.

Through the homogeneity test, the significance value is 0.67. So, with a significance level of ≥ 0.05 , the data has the same variance value or data from both homogeneous classes as shown in table IV-15. Through the independent sample t-test, the probability value (significance 2 tailed) with the t-test is 0.000. This shows that the probability value is less than 0.05, then H_0 is rejected and H_a is accepted or the development of e-module-based teaching materials with quizizz applications is effective on student mathematics learning outcomes as shown in table IV-16. Student responses to e-module-based teaching materials with the quizizz application are in a fairly good category. This can be seen from the results of data analysis of the cumulative average acquisition of the response questionnaire with the five indicators in table IV-23 obtaining 77.6% with good criteria. This shows that students' responses to e-module-based teaching materials with the quizizz application are good.

REFERENCES

- Hamid, H. (2013). *Pengembangan Sistem Pendidikan Di Indonesia*. Bandung: Pustaka Setia
- Legendari, A. M., & Raharjo, H. (2016). Pengembangan Bahan Ajar Berbasis Audio Visual Terhadap Hasil Belajar Siswa Pada Materi Pokok Bangun ruang Kubus Dan Balok Kelas VIII Di SMP N 1 Ciledug. *EduMa*, 5(1), 70-79.
- Mangesti, A. F. (2020). Pengembangan Bahan Ajar Berbentuk Majalah Berbasis PBL Untuk meningkatkan Minat Baca Siswa. *Skripsi: Universitas Panca Sakti Tegal*, 11.
- Meidawati, Y. (2014). Pengaruh Pendekatan Pembelajaran Inkuiri Terbimbing Terhadap Peningkatan Kemampuan Pemecahan Masalah Matematis Siswa SMP. *Jurnal Pendidikan dan Keguruan*, 1(2), 1-10.
- Munir. (2009). *Pembelajaran Jarak Jauh Berbasis Teknologi Informasi dan Komunikasi*. Bandung: Alfabeta.
- Priyanthi, K. A. (2017). pengembangan e - modul berbasis simulasi berorientasi pemecahan masalah pada mata pelajaran komunikasi data. *karmapati*, 3.
- Raharjo, h. (2017). Pengaruh Penggunaan Macromedia Flash Terhadap Hasil Belajar Pada Pokok Pembahasan Geometri Dimensi Tiga. *EduMa*, 6(2), 9-20.
- Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta.
- Suprihatiningrum, J. (2016). *Strategi Pembelajaran: Teori dan Aplikasi*. Jogjakarta: Ar-Ruzz.
- Supuwingsih, N. N. (2021). *E-Learning untuk Pembelajaran Abad 21 dalam Menghadapi Era Revolusi Industri 4.0*. Bandung: Penerbit Media Sains Indonesia.
- Udin, T., Maufur, S., & Riyanto, O. R. (2022). Student's Self-Efficacy and Perceptions of Online Learning on the Use Learning Management System. *Journal of Education Technology*, 6(1), 165-172.
- Ulhusna, M., Dewimarni, S., & Rismaini, L. (2021). Sosialisasi Quizizz Sebagai Media Pembelajaran Berbasis Digital Pada Masa Pandemi. *Jurnal Pengabdian Kepada Masyarakat*, 1(2), 156-165.
- Wahid, S., & Izzati, N. (2022). Development of Contextual Brochures in Learning Mathematics to Improve Student Learning Outcomes and Creativity. *EduMa*, 11(1), 109-118.
- Winarso, W., & Wahid, S. (2020). Development of Mathematics Teaching Device Integrated with Quranic Values: Issues, Challenges, and Implementation Model. *International Journal of Learning, Teaching and Educational Research*, 19(1), 97.