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What is the influence of BOSQU as a learning medium?

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Abstract

The use of learning media according to the conditions and needs of students has an influence on learning motivation and mastery of students' mathematical concepts, so teachers need to know the media criteria that must be used so that students can be liked and accepted. Quizizz is one of the learning media in the form of quizzes and is based on 4.0. Teachers can choose Quizizz as a learning media based on games and technology. This study aimed to describe the effect of using Quizizz media on junior high school students learning motivation and mastery of mathematical concepts. This research is pre-experimental quantitative research, namely one group pre-test – post-test design (before and after). The number of samples in this study was 28 students, consisting of one class. The instruments used were questionnaires and test sheets. Data collection techniques were carried out in the form of questionnaires and tests. Based on the results of the research data analysis, it was found that the value of Sig. (2-tailed) learning motivation is 0.000 <0.05. So it can be concluded that there is an influence of Quizizz learning media on student learning motivation. Furthermore, it was found that the value of Sig. (2-tailed) mastery of mathematical concepts is 0.000 <0.05. So it can be concluded that there is an influence of Quizizz learning media on students' mastery of mathematical concepts. 05. So, it can be concluded that there is an influence of Quizizz learning media on student learning motivation. Furthermore, it was found that the value of Sig. (2-tailed) mastery of mathematical concepts is 0.000 <0.05. So it can be concluded that there is an influence of Quizizz learning media on students' mastery of mathematical concepts. 05. So, it can be concluded that there is an influence of Quizizz learning media on student learning motivation. Furthermore, it was found that the value of Sig. (2-tailed) mastery of mathematical concepts is 0.000 <0.05. So it can be concluded that there is an influence of Quizizz learning media on students' mastery of mathematical concepts.

Keywords: Quizizz, Learning Motivation, Concept Mastery, Mathematics

INTRODUCTION

The development of information technology in the 21st century is very rapid; it significantly impacts the world of education (Anhar et al., 2023; Haris Basyaev et al., 2021; Sugianto & Darmayanti, 2021). Technology can also give birth to new features in the world of education. Multimedia-based teaching systems such as images (Inganah et al., 2023), video (AN Vidyastuti et al., 2018; Hudha et al., 2023), text (MM Effendi et al., 2022), and sound (Fauza et al., 2023; Sah RWA et al., 2022). Conveying the material is not too monotonous; it invites student interest and facilitates the delivery of related materia (MR Cahyadi et al., 2023;

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PAD Rizqi et al., 2023). Students can study material independently by using computers equipped with multimedia-based programs.

The progress of science and technology can at least accompany education in general (Cahyadi et al., 2023; Sugianto et al., 2023). Following today's, much software classified as edutainment means a combination of education (education) and entertainment (entertainment). Therefore, the use of technology, which is very popular in the era of globalization, is significant for learning needs and can facilitate learning activities so that they can form effective and efficient conditions and improve the quality of learning so that it is not too monotonous (Anshori, 2019).

Teachers as teaching staff have challenges in how to take advantage of these scientific and technological advances to carry out the learning process in the world of education (Solikah, 2020). The rapid progress of science and technology requires schools or other educational institutions to keep up with changes and media use in the learning process (Sari, 2020). With this change, teachers must be able to utilize technology-based learning media that can be used in the learning process.

With the more extensive technological advances, the teacher must develop various kinds of learning media. Technology-based learning media can contribute as well as facilities in understanding the teaching material that teachers want to convey so that students can easily understand the material being taught and add insight into information technology knowledge for students.(Rahmi & Samsudi, 2020). Learning media created should pay attention to each student's characteristics related to learning motivation (Rahmadhani et al., 2021).

Learning media is an integral part of the learning process to influence the effectiveness of the learning process (Mulyati & Evendi, 2020). Learning effectiveness measures the success of an interaction process between students and teachers to achieve learning objectives. We can see the success of learning objectives from student activities during learning, student motivation toward learning, and student mastery of concepts (Arianda et al., 2021). Achieving an effective and efficient learning concept requires a reciprocal relationship between students and teachers to achieve a goal together; besides that, effective learning must be able to shape students' thinking patterns, especially in learning mathematics.

One of the technological developments is computers and gadgets. The development of computer technology can assist in making learning media, while devices can be used to assist in applying these learning media (Firmadani, 2020). In this regard, to take advantage of existing technological advances and almost every student has a device, especially an Android-based device, it is necessary to apply learning media in the form of an Android application to support the learning process in class.

Efforts that can be made to increase students' motivation and mastery of concepts are creating exciting and interactive learning media that prioritize cooperation, communication, and, most importantly, that can lead to interaction between students, one of which is through games. Games have the characteristics of creating motivation in learning, namely fantasies, challenges, and curiosity (Irwan et al., 2019). Games cause interaction with one another between players by following predetermined rules to achieve a goal.

Quizizz is a game-based educational app that brings multiplayer activities to the classroom and makes learning interactive and fun (Munuyandi et al., 2021) Amiroh & Afifah, 2021). Using Quizizz, students can do exercises in class via their cell phones. Unlike other educational applications, Quizizz has game characteristics such as avatars, themes, memes, and music, which are entertaining in the learning process. Quizizz also allows students to compete with each other and motivates them to study (Zhao, 2019). Students take the quiz simultaneously in class and see their live ranking on the leaderboard. Instructors can monitor the process and download reports when quizzes are over to evaluate student performance. Using this app in accounting classes helps motivate students and improve learning outcomes.

Based on research conducted by (Musfirah et al., 2022), the use of Quizizz media has a positive effect on learning outcomes in science learning for elementary students, which is shown through an increase in learning outcomes after being given treatment in the form of teaching using Quizizz. This proves that there is an effect of using Quizizz on student learning outcomes. In line with research(Rahman et al., 2020), using Quizziz as a medium for giving quizzes significantly affects student learning motivation.

Motivation to learn is one factor that influences students' mastery of concepts (Akuba et al., 2020). Concept mastery is capturing meanings, such as expressing a material presented in a more understandable form, providing interpretation, and applying it (Tipani, Anita., 2019). Mastery of the concept is one of the learning outcomes (Y. Yunita et al., 2019). Therefore, concept mastery is the level where a student knows mathematical concepts and understands them well, which is demonstrated by his ability to solve various problems related to the idea itself and its application in new situations.

According to research(Gusniwati, 2021), there are seven indicators of mastery of mathematical concepts, namely: 1) restating a concept; 2) classifying objects based on specific characteristics; 3) providing examples and non-examples of the concept; 4) presenting concepts in various forms of mathematical representation; 5) develop necessary or sufficient conditions for a concept; 6) use, utilize, and select specific procedures or operations; 7) apply the concept.

From the explanation behind this research, it was concluded that learning mathematics can use technology-based media, namely Quizizz. The study discusses Quizizz learning media teachers can use as a fun alternative to mathematics learning. Learning models, methods, and strategies that are appropriate and optimally supported by interactive media have been developed to generate students' motivation and ability to master concepts in learning mathematics. Therefore, researchers are interested in conducting research titled "The Influence of Quizizz as a Learning Media on Learning Motivation and Ability to Master Mathematics Concepts in Junior High School Students."

LITERATURE REVIEWS

Motivation to learn

Everyone's learning motivation is different; different educational backgrounds can also affect students' perceptions of the subjects they study, especially mathematics and algebra differences in understanding algebraic mathematics result in each student having a different motivation to learn and think critically. Students are expected to be sensitive to existing situations and be able to analyze definitions and implement them to sharpen their mathematical critical thinking. Everyone's learning motivation is different, and student’s perceptions of the subjects they study, especially mathematics and algebra, can be influenced by their educational background. Due to differences in understanding of algebraic mathematics, each student has a different motivation to learn and think critically (Scherer, 2016; Usmiyatun, 2022).

Many factors influence the success of learning, one of which is the non-cognitive factor, namely motivation to learn; in achieving success, reason to learn is essential, even affecting performance and the development environment itself. Understanding motivation is very important for students because it greatly influences how much they will learn from a learning activity or how much they absorb in capturing the information presented. Students who are motivated to learn will use higher cognition in learning the material so that students can absorb and grasp it better. The importance of learning motivation for students is (1) awareness of the position at the beginning of learning, process, and final results; (2) information about the power

of learning effort, which is compared with peers; (3) directing learning activities; (4) raising the spirit of learning; and (5) make awareness about the existence of a continuous learning journey and then work (between the breaks or play), the individual is trained to use his strengths in such a way that it can be successful. These five things show how important the perpetrators themselves realize motivation. If students realize motivation, the learning task will be completed properly (Liunome et al., 2020; N. Yunita et al., 2018).

Learning motivation is a psychological factor that is non-intellectual. Its distinctive role is in terms of growing enthusiasm, feeling happy, and enthusiasm for learning or in the form of internal and external encouragement to students who are learning to change their behavior. In addition, learning motivation is something that encourages someone to have the desire to make changes in behavior and participate in learning activities voluntarily without coercion from any party (Huriyanti & Rosiyanti, 2017; Yunus, 2020).

Based on some of the above understanding, learning motivation is the encouragement of someone who can foster a spirit of learning by behaving and participating in teaching activities voluntarily without coercion from any party inside the use of the learning media Quizizz.

Mastery of Mathematical Concepts

A concept is a mental picture of an object, process, or anything outside of language used by reason to understand other things or an abstract idea that allows us to classify objects and events that are included or not in an abstract idea. The. The presentation of new mathematical concepts or ideas must be based on previous experience because students will remember new concepts better if these concepts are separate from previously known images. In mastering mathematical concepts and structures, students must form concepts or designs through previous experience (Ginanjar, 2019; Seruni, 2015).

Gusniwati (2015) explains that seven indicators of mastery of mathematical concepts that students can see are: 1) restating a concept; 2) classifying objects based on specific characteristics (according to the concept); 3) providing examples and non-examples of the concept; 4) present the concept in various forms of mathematical representation; 5) develop necessary or sufficient conditions for a concept; 6) use, utilize, and select specific procedures or operations; 7) apply the concept or problem-solving algorithm. Mastery of mathematical concepts is a person's ability and ability to convey ideas that are owned in abstract form to concrete things so that others can easily understand them in learning mathematics (Defi et al., 2021; Gusniwati, 2015).

Mastery of mathematical concepts is influenced by learning independent variables. Independent learning is a dynamic process in which students build knowledge, skills, and attitudes when studying specific contexts. Learning independence is an ongoing process of building specific skills and expertise (Ardiansyah, 2018; Solihah et al., 2022).

Based on the description above, mastery of mathematical concepts is a person's ability and ability to translate ideas that are owned in abstract form into concrete things so that others can easily understand them in learning mathematics or the product of a person's learning activities to understand and understand an object. Alternatively, objects through one's observations and experiences in solving mathematical problems are influenced by learning independent variables.

RESEARCH METHODS

This research is a quantitative pre-experimental study, namely one group pre-test post-test design (before and after). The experiment was carried out in one group without a comparison group. In this design, measurements were made of the subject's dependent variable at the beginning of the study. After treatment, the dependent variable is repeated with the same measuring instrument (Barthels & Das, 2021). This research was conducted at Pagelaran 1 Public Middle School, Malang Regency, with a population of 211 students. The sample used was class IX-E totaling 34 students as an experimental class.

The research procedure begins with the preparatory stage, namely finding relevant locations and compiling research instruments through questionnaires and tests. Then the researcher collected subjects consisting of 28 students. Questionnaires were distributed to measure the level of learning motivation before using Quizizz learning media. The pre-test score was obtained from the test results given to experimental class students before treatment. After that, the researcher gave treatment in the form of Quizizz learning media three times in two weeks. The first treatment subject was introduced to basic information about Quizizz learning media and quadratic function material in Quizizz to adapt. The treatment of two subjects was given material through Quizizz and then given questions to practice working on their respective papers. The treatment of three issues was given material strengthening then they worked on the practice questions on Quizizz. Furthermore, the researcher returned to giving the test after the sample treatment was completed (post-test). At the end of the lesson, questionnaires were distributed to measure the level of learning motivation after using Quizizz learning media.

The instruments used are instruments in the form of questionnaires and tests. Questionnaires are used to measure the level of student learning motivation during learning by using Quizizz interactive learning media. The questionnaire used was the ARCS (Attention, Relevance, Confidence, Satisfaction) model by John Keller. Four indicators can be used as a reference for measuring student learning motivation: attention, relevance, confidence, and satisfaction. According to Sugiyono (Setiyani et al., 2020), The questionnaire will be filled out by students and assessed as follows.

Table 1. Questionnaire Assessment Criteria

Criteria	**Score**	
	Positive Questions	***Negative Questions***
Strongly Agree (SS)	4	1
Agree (S)	3	2
Disagree (TS)	2	3
Strongly Disagree (STS)	1	4

The instrument in a test sheet determines students' mastery of concepts before and after using Quizizz learning media.

Data analysis techniques include the following.

1) Prerequisite Analysis Test

Used to determine normal or not the data being analyzed. By using Shapiro-Wilk in SPSS with the following test criteria.

a) Sig. Value or significance or probability value < 0.05, the distribution is not normal.
b) Sig. Value or significance or probability value > 0.05, the distribution is normal.

2) Hypothesis testing

The paired sample t-test was used to determine the effect of Quizizz learning media on students' learning motivation and mastery of concepts. The hypothesis to be tested is as follows.

a) Student's motivation to study
Ha: There is an influence of Quizizz learning media on students' learning motivation.
Ho: Quizizz learning media does not influence student learning motivation.
b) Mastery of Student Concepts
Ha: There is an influence of Quizizz learning media on students' mastery of concepts.
Ho: Quizizz learning media does not influence students' mastery of concepts.

The basis for making the decision is as follows.

a) If the value of Sig. (2-tailed) < 0.05, then H0 is rejected.
b) If the value of Sig. (2-tailed) > 0.05, then H0 is accepted.

RESULTS AND DISCUSSION

RESULTS

Based on the research that has been done, the results obtained are in the form of learning motivation and mastery of students' concepts with the following explanation.

Motivation to learn

Student learning motivation was obtained through a questionnaire distributed before (beginning) and after (after) being given the treatment of learning mathematics using Quizizz media.

1) Initial Motivation

Students' initial motivation on the statement of the attention indicator gets a percentage of 62.5%. On the relevance indicator, we get a share of 74.7%. On the confidence indicator, get a percentage of 72.61%. The last hand, namely, satisfaction, get a rate of 65.77%.

2) Final Motivation

Students' final motivation on the statement of the attention indicator gets a percentage of 78.86%. On the relevance indicator, get a percentage of 80.35%. On the confidence indicator, we get a percentage of 79.76%. The last hand, namely satisfaction, gets a rate of 81.84%.

The results of the student's initial and final motivation can be illustrated in the following graph.

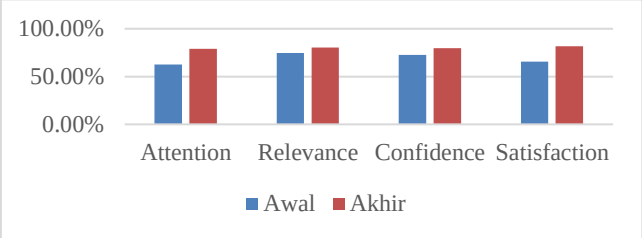

Figure 1. Early and Late Learning Motivation of Students

Mastery of Mathematical Concepts

Mastery of students' mathematical concepts was obtained through the results of tests carried out by students before (beginning) and after (end) using Quizizz learning media. The results of the pre-test and post-test values can be seen in the following table.

1) Mastery of Initial Concepts

In the pre-test, to measure mastery of the initial concepts, students get a total score of 741 with an average score of 26.46. On the indicator of restating a concept, an average of 2.19 is obtained. The indicator classifying objects based on specific characteristics has an average of 2.357. The hand provides examples and non-examples of concepts with an average of 1.607. The indicator of presenting ideas in various forms of mathematical representation averages

2.339. The indicator of developing necessary or sufficient conditions for a concept has an average of 2.071. The hand of using, utilizing, and selecting specific procedures or operations averages 1.705. The indicator of applying the idea obtains an average of 1.179. The following details the average student pre-test.

Table 2. Average Student Pre-Test

Indicator	Average
Restating a concept	2,19
Classify objects based on specific properties	2,357
Provide examples and non-examples of concepts	1.607
Presenting concepts in various forms of mathematical representation	2,339
Develop necessary or sufficient conditions for a concept	2,071
Using, utilizing, and selecting specific procedures or operations	1.705
Apply the concept	1,179
Overall Average	26,46

2) Final Concept Mastery

In the post-test, students get a total score of 966 to measure mastery of the final concept, with an average score of 34.5. In the indicator of restating an idea, an average of 2.643 is obtained. The hand-classifying objects based on specific characteristics have an average of 2.679. The writing provides examples and non-examples of concepts with an average of 2.393. The indicator of presenting ideas in various forms of mathematical representation averages 2.768. The hand of developing necessary or sufficient conditions for a concept has an average of 2.607. The writing of using, utilizing, and selecting specific procedures or operations averages 2.321. The indicator of applying the idea obtains an average of 2.036. The following details the average student post-test.

Table 3. Average P0st-Test of Students

Indicator	Average
Restating a concept	2,643
Classify objects based on specific properties	2,679
Provide examples and non-examples of concepts	2,393
Presenting concepts in various forms of mathematical representation	2,768
Develop necessary or sufficient conditions for a concept	2,607
Using, utilizing, and selecting specific procedures or operations	2,321
Apply the concept	2,036
Overall Average	34.5

Prerequisite Analysis Test

The normality test in this study is used as a prerequisite for the paired sample t-test. The data used for the paired sample t-test must be normally distributed. The data must be normally distributed for the paired sample t-test to be continued. A distribution is said to be expected if the significance level is > 0.05; otherwise, if the significance level is <0.05, then a distribution is declared not normal. To test normality using the lilies test. The results of the calculation of the normality test are as follows.

Table 4. Normality test of the initial motivation questionnaire and pre-test.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MOTIVASI AWAL	.126	28	.200*	.971	28	.608
PRE TEST	.155	28	.082	.964	28	.424

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on Table 4 of the normality test output above, it can be seen that the Asymp.Sig. (2-tailed) the initial learning motivation variable value is 0.608 > 0.05, and the concept mastery pre-test variable is 0.424 > 0.05. So, the data is usually distributed.

Table 5. Normality test of the final motivational questionnaire and post-test.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MOTIVASI AKHIR	.135	28	.200*	.971	28	.603
POST TEST	.147	28	.125	.929	28	.059

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on Table 5 of the normality test output above, it can be seen that the Asymp.Sig. (2-tailed) value in the final learning motivation variable is 0.603 > 0.05, and in the post-test concept mastery variable is 0.059 > 0.05. So, the data is usually distributed.

Hypothesis testing

After the prerequisite test is met, the next step is to test the research hypothesis with a paired sample t-test. The following is a test of the learning motivation hypothesis based on the initial and final motivational questionnaires.

Table 6. Hypothesis Test of Early Learning Motivation and Late Learning Motivation

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	MOTIVASI AWAL - MOTIVASI AKHIR	-5.429	4.131	.781	-7.031	-3.827	-6.953	27	.000

Based on the t-test table above, it is known that the Sig. (2-tailed) < 0.05, i.e., 0.000 < 0.05, then Ho is rejected, and Ha is accepted. From the paired sample t-test, there is an influence of Quizizz learning media on student learning motivation. The following is a hypothesis test for student mastery of concepts based on pre-test and post-test scores.

Table 7. Pre-test and post-test hypotheses

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	PRE TEST - POST TEST	-8.036	5.802	1.097	-10.286	-5.786	-7.328	27	.000

Based on the t-test table above, it is known that the Sig. (2-tailed) < 0.05, i.e., 0.000 < 0.05, then Ho is rejected, and Ha is accepted. From the paired sample t-test, there is an influence of Quizizz learning media on students' mastery of mathematical concepts.

DISCUSSION

Based on the research that has been done, there is a positive influence of the use of Quizizz learning media on learning motivation and mastery of mathematical concepts for class IX students in the Quadratic Function material. Teachers feel helped by the existence of learning media in the form of game-based quizzes because, with Quizizz media, students are unknowingly invited to learn while playing. From the students' side, students feel helped by practicing questions in the form of quizzes so that students more easily understand the learning

material being taught. Based on the questionnaire, pre-test, and post-test results, several things can be stated, including the following.

High learning motivation affects students' mastery of mathematical concepts. Student motivation used in this study includes four components, attention (Attention), relevance (Relevance), confidence (Confidere), and satisfaction (Satisfaction). Student motivation is a significant factor in mastering the concept (Armalasari et al., 2017; Merta, 2021). This is confirmed by opinion(Riesyaputra et al., 2015) that the success of the level of mastery of the concept is caused by several factors, including high learning motivation, independent learning, freedom of students in asking and expressing opinions, and creativity

The learning media the teacher uses can influence the mastery of mathematical concepts. In the learning process, teachers must be able to develop learning strategies and choose the correct media because the teaching and learning process using media produces better processes and mastery of concepts than without learning media. Activities carried out in learning are closely related to the media used during learning. Learning media is a form of learning strategy. Appropriate learning media plus activities that support learning will increase students' enthusiasm for participating in learning with high enthusiasm, increasing their learning motivation (Handziko & Suyanto, 2015). The more innovative the teacher is in using media in the learning process, the more interested and enthusiastic students are in participating in the teaching and learning process (Dinah Irfani Safaras Hapsari, 2021).

Quizizz learning media brings an innovation in which students not only listen to the material provided by the teacher, but they can see, hear and do something related to the material being taught using technology. The application of Quizizz in learning Mathematics received a good response from students. Based on the pre-test and post-test scores, the Quizizz learning media has an influence and also increases the average student score. Quizizz is an exciting learning medium because Quizizz media provides a new atmosphere, makes it easier for students to understand learning material, and several features increase student motivation. This opinion follows the opinion that using Quizizz media in learning mathematics becomes more meaningful and fun because there is cooperation in Quizizz competitions to complete assignments to become winners. Students become enthusiastic and more active both in asking questions and expressing opinions or exchanging information (Dwi Agoes Sumarni, 2022);(Kartiwi & Rostikawati, 2022);(Anggraeni & Komalasari, 2022);(Kurnia et al., 2022)

CONCLUSION

The results of this study's data analysis indicate that there is an effect of using the Quizizz application as a learning medium for junior high school students on learning motivation and mastery of mathematical concepts. The value of Sig evidence this. (2-tailed) of 0.000 for learning motivation and concept mastery. Thus, Ha in this study was accepted.

Open Problem

Suggestions for further research are expected to develop more diverse research variables, expand the research population, and develop better research instruments.

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