

PKM Learning Mathematics through Quizizz Game Media to Improve Student Learning Outcomes of State Middle School 9 Batam

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Abstract. Advances in science and information and communication technology, as a product of changing times, have positively impacted the advancement of education today. The digital era, known as the Industrial Revolution 4.0, has brought about rapid change. Numerous digital learning applications can be used effectively and efficiently as learning support tools. This research requires innovative learning media to prevent students from getting bored during the teaching and learning process. Many digital learning applications can be used effectively and efficiently as learning support media. The purpose of this study was to determine the improvement in student learning outcomes in the material on Exponents and Roots of Grade IX at SMPN 9 Batam . Data collection was carried out using test and observation methods from September to October 2025.

Keyword: Mathematics learning, learning outcomes, quizizz

Abstrak. Kemajuan dalam ilmu pengetahuan dan teknologi informasi dan komunikasi, sebagai produk perubahan zaman, telah berdampak positif pada kemajuan pendidikan saat ini. Era digital, yang dikenal sebagai Revolusi Industri 4.0, telah membawa perubahan yang pesat. Banyak aplikasi pembelajaran digital dapat digunakan secara efektif dan efisien sebagai alat bantu pembelajaran. Penelitian ini membutuhkan media pembelajaran inovatif untuk mencegah siswa bosan selama proses pengajaran dan pembelajaran. Banyak aplikasi pembelajaran digital dapat digunakan secara efektif dan efisien sebagai media bantu pembelajaran. Tujuan penelitian ini adalah untuk mengetahui peningkatan hasil belajar siswa pada materi Eksponen dan Akar Kelas IX di SMPN 9 Batam. Pengumpulan data dilakukan dengan menggunakan metode tes dan observasi dari September hingga Oktober 2025.

Kata kunci: Pembelajaran matematika, hasil belajar, kuis

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Introduction

The use of information technology in this era of globalization and the digital era cannot be ignored and has become a vital need for society, so that the development of information technology is growing rapidly and progressing and has received very good interest from the public. This development of information technology has a significant impact on various aspects of life. One of them has a positive impact on the field of education (Basori, 2013; Herlambang & Hidayat, 2016) which has resulted in an increase in the quality of education (Nasrullah, Ende, & Suryadi, 2017).

The rapid advancement of science, information technology, and communication is expected to have a positive impact on the current world of education. It is hoped that it can become a highly effective and efficient medium to support the learning process. A variety of IT-based multimedia facilities, including various engaging learning applications, both free and paid, can be utilized to make the learning process more engaging and maximum. Mathematics is a compulsory subject for all students, from elementary school to higher education. This helps students think logically, analytically, systematically, and critically. Mathematics is generally viewed as a difficult subject by students. Many students still struggle and fear learning mathematics, either due to monotonous learning or simply not enjoying it.

This presents a challenge for teachers to create engaging and enjoyable learning. Enjoyable learning can be created through the use of various learning models or methods, as well as engaging learning media, which can motivate students to learn and facilitate their understanding of the material. One approach to developing learning media using computers, laptops, and mobile phones or smartphones is through the use of educational games. Although these educational games are still rare, their use in learning media is very limited. Games, as a learning medium integrated with materials or evaluation questions, are expected to make learning more engaging and enjoyable. This is in line with Henry (2010: 53-54), who discussed the positive impacts of using games, including fun and entertaining games and providing practice in problem-solving and logic.

This study will discuss the Quizizz learning application that can be used by teachers as an alternative mathematics learning media. The Quizizz game is a game-based educational application, which brings multi-player activities into the classroom and makes it an interactive and fun practice class (Purba, 2019: 5) used in classroom learning. The interactive quiz created has up to 4 answer choices including the correct answer and can be added to the background of the question. Once the quiz is complete, we can share the code with students so they can log in to the quiz. Quizizz also provides data and statistics on student performance. Teachers can track how many students answered the questions that have been created, questions that must be answered and more. Teachers can even download statistics in the form of Ms. Excel. Quizizz also provides a "homework" feature, so that students' homework can be done anytime and from anywhere. This allows students to be more flexible in doing homework and teachers can limit the time for homework. Unlike other educational applications, the Quizizz game has game characteristics such as avatars, themes, memes, and entertaining music in the learning process. Quizizz also allows students to compete with each other and motivates them to learn so that learning outcomes can improve.

The online quiz app Quizizz can be used by teachers to assess students' learning progress. Its ease of use and rapid assessment results make it a suitable learning tool to support the 4.0 learning revolution, fostering students' strong interest and motivation to learn. Teachers must have a question bank. This app can be used to store questions and then analyze them to create valid, reliable questions with a good level of differentiation and difficulty. This makes learning more enjoyable (Lasia Agustina, Sesiomadika 2019, pp. 1-7).

This study was conducted to determine students' learning outcomes and process skills by implementing the Quizizz game. This study used four stages: planning, organizing, implementing,

controlling, and evaluating. This study was conducted at SMP Negeri 9 Batam. The subjects were 46 students in grade IX-1.

1. Planning

At this stage, the researcher prepares the things needed to use the Quiziz application, such as

- 1) Prepare questions according to the material to be tested, in this case the material on exponents and roots of exponents.
- 2) Input the prepared questions into the quiziz application
- 3) Copy the link issued by the Quiziz *application*

2. Organizing

The subjects of this study were 46 students in grade IX-1, consisting of 22 boys and 24 girls. Before starting the test, the researcher arranged the seating to monitor the students' activities and prevent cheating in completing the questions, resulting in more representative results and a true reflection of the students' abilities.

3. Implementation

This research was conducted in the first semester of the 2025/2026 academic year starting from September 1 to October 5, 2025, which was divided into two tests, namely *Pre-Test* and *Post-Test*. Data collection techniques in this study were: a) Test, used to obtain test data on student learning outcomes. b) Observation, used to obtain data on student process skills in the learning process that implemented the Quizizz game media.

At this stage, the researcher shared the Quiziz link with the subjects and guided them to join. Once everyone had joined, the test began. After the first test was completed, the researcher explained the relevant material before starting the second test.

4. Control

At this stage, researchers conducted monitoring from two perspectives. First, they directly/physically monitored the subjects participating in the game. Second, they also monitored the subjects through data provided by Quiziz, such as correct answers, speed of answering questions, and the subjects' rankings on Quiziz based on their scores.

5. Evaluation

At this stage, researchers will conduct reflective measurements and descriptions of the activity through statistical data generated by Quiziz based on the results of the first and second tests.

This data will demonstrate the subjects' motivation in taking the test, their ability to answer the questions, and their speed of response.

Results and Discussion

The study involved subjects who were students of class IX-1 at State Junior High School (SMPN) 9 Batam in class IX-1. First, the researcher instructed all subjects to prepare the telephones they had brought from home. After preparing the telephones, the researcher used a projector to share a previously created link at the front of the classroom and instructed the subjects to scan the link displayed. Once all subjects had joined, the game began. Once the game began, the researcher was tasked with ensuring the subjects answered the questions correctly. A supporting factor in this regard was the subjects' ability to understand the game instructions from the researcher well and quickly. However, a constraint encountered during the study was the

unavailability of devices for some subjects, requiring them to use them alternately, which took longer. This study involved 46 students, consisting of 22 male students and 24 female students. In the *pre-test phase*, 36 participants participated. One participant scored 80 or above, nine scored between 60 and 79, and 26 scored below 60.



Figure 1 Attendance and Participation

Meanwhile, at the *post-test stage*, there were 40 participants. There were 12 people who got a score of 80 and above. There were 19 people who got scores between 60 -79. Meanwhile, 9 people got a score below 60.

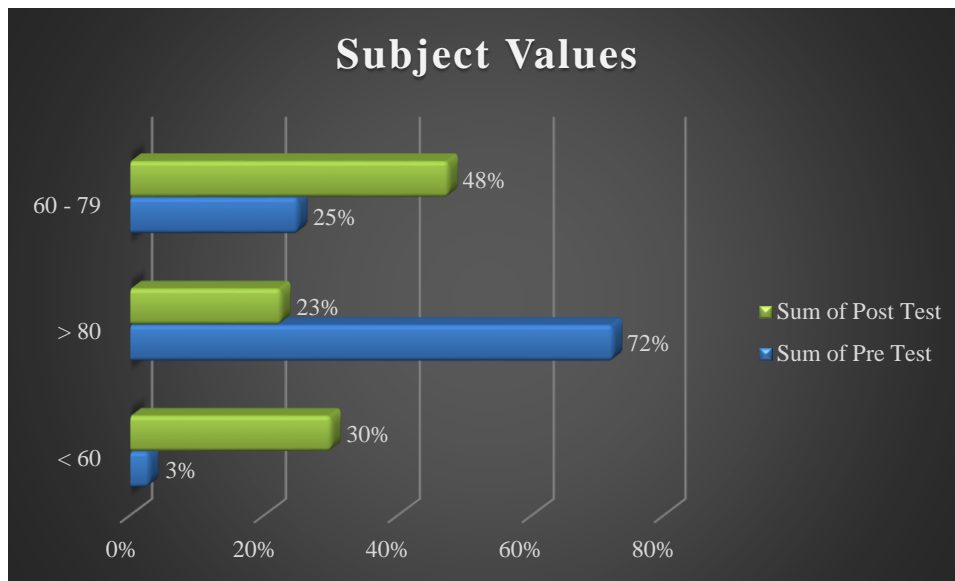


Figure 2 Pre and post test values

With the variety in implementing mathematics learning - in this case using the interactive media Quizizz - it really makes mathematics learning fun for students to follow. We can see in the graph there is an increase in participants in the second test - *Post Test* - by students from the first test - *Pre Test* - . Although the increase in scores is not very even, at least the use of interactive media Quizizz in the teaching and learning process also helps the process to be fairer , where we can see the variation in scores when *the post test* is carried out, unlike *the pre-test* where the majority of students have average scores that are quite close. Leony Sanga LP in JDP entitled Improving Student Learning Concentration (Purba LS, 2019). Through the Utilization of Quizizz Learning Evaluation in the Physical Chemistry I course concluded that there was an increase in student learning concentration through the utilization of Quizizz learning evaluation in the Physical Chemistry I course of 0.45 with the interpretation of a moderate increase. The accuracy indicator experienced an increase of 0.53 and the understanding indicator experienced the lowest increase of 0.36. So that learning evaluation using Quizizz helps improve student learning concentration.

Conclusion and Recommendations

Conclusion

Through a study entitled " Learning Mathematics Through Quizizz Game Media to Improve Student Learning Outcomes of State SMP 9 Batam" , data was found on the high participation of students in carrying out mathematics learning, a subject considered difficult by many people when using interactive game-based learning methods. This can be seen from the high participation of students who participated in the game. Although not yet significant, it is also clear how this method is able to measure the increase in student understanding of the material learned in class. This can be seen from the comparison between *the pre-test* and *post-test* that students did. At least this can be an initial step in reducing the assumption that learning mathematics is difficult and boring.

Recommendations

During the research, the researcher realized several shortcomings. In this study, the researcher encountered difficulties in ensuring that the subjects, in this case the students, brought the necessary tools and materials. The researcher recommends collaborating with parents to ensure that students bring the necessary tools and materials.

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