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Application of QuizWhizzer-based Educational Games to Improve Students' Learning Outcomes on History Lessons

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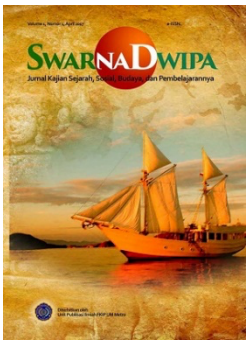

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Abstract

This study examines the implementation of QuizWhizzer-based educational games in history learning for class X.7 at SMA Negeri 2 Metro. The main objective is to improve student learning outcomes through more interactive and engaging methods. Using the Classroom Action Research (CAR) method, this study was conducted in two cycles, involving 36 students. Data were collected through observation, interviews, documentation, and tests. The results show a significant increase in student engagement and learning outcomes. In the initial test, only 22% of students achieved the Minimum Completeness Criteria (KKM). After implementing QuizWhizzer, the completion rate increased to 53% in cycle I and 94% in cycle II. Observations indicated a 30% increase in student engagement and higher learning motivation. This study concludes that the use of QuizWhizzer as a learning medium is effective in enhancing student engagement, motivation, and learning outcomes in history subjects. These findings support the adoption of educational games as an innovative and effective learning strategy.

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INTRODUCTION

Education is the transformation of knowledge, culture, and values that develop in one generation so that they can be passed on to the next generation. Education is a process of teaching and learning activities or an interaction between teachers and students, which takes place in the learning process (Afifah, 2018). History education plays an important role in the school curriculum, aiming to shape students' understanding of the development of past events and their relationship with current social, political, and cultural situations (Mulligan, 2013). History learning is a way to internalize moral values, national spirit, and insights into the strong character of the nation, future orientation, and independence among students by understanding the substance and models of history learning that develop historical knowledge materials to achieve the expected goals in the history subject according to the curriculum (Zubaidah, 2022). Nevertheless, the challenges in teaching history often include material that is considered monotonous, less engaging teaching methods, and low motivation and involvement from students (Barton & Levstik, 2004). This has the potential to lead to suboptimal learning outcomes for students (Deci & Ryan,

2000). In an effort to enhance the effectiveness of history learning, innovative and enjoyable approaches are essential (Gee, 2003).

The use of media as a companion in the learning process is necessary to address the problems that arise in the learning process (Faijah, 2021). One of the solutions that has emerged is the use of technology in education, particularly educational games (Hwang & Chang, 2011). Delivering material using games will feel more enjoyable and will be easier to remember and understand (Sutriati, 2022). Well-designed games can lead to significant improvements in student productivity and creativity (Dohny, 2024). Educational games help students have a better understanding and make their learning more enjoyable (Faijah, 2021). In addition, the advantage is that it provides various forms of stimulation to students, especially to engage them and motivate them to remain active during lessons (Hamid, 2022). Educational games have been proven to enhance student engagement and motivation, as well as improve understanding of the subject matter through interactive and engaging methods (Dondlinger, 2007; Zhang & Zhang, 2011).

QuizWhizzer is one of the quiz game platforms designed to make learning more engaging (Davies, 2001). QuizWhizzer is a game that can be used in education with the aim of making students feel happy and not bored while learning, as well as helping teachers deliver more interesting and less monotonous material (Putri, 2022). This game application has interesting features, with the availability of many game board templates that can be used and the color display of quiz numbers (Wahyuningsih, 2021). By offering competitive yet educational game mechanics, QuizWhizzer provides an opportunity for learners to study while competing in a dynamic environment (Clark & Mayer, 2016). This game allows students to engage directly with the subject matter through specially designed quiz questions, as well as receive immediate feedback that can help improve their understanding (Hwang & Chang, 2011).

This research aims to explore the application of QuizWhizzer-based educational games in history subjects, as well as to evaluate their impact on students' learning outcomes. (Purwanto, 2016). The main focus of this research is to determine whether the use of QuizWhizzer can enhance students' understanding of historical material, motivation, and academic outcomes (Suhada et al., 2020). By analyzing the learning outcomes of students who use conventional methods compared to those who use QuizWhizzer, this study aims to provide insights into the effectiveness of educational games in the context of history learning and their contribution to improving students' learning outcomes (Davies, 2001; Suhada et al., 2020).

In the initial observation conducted at State High School 2 Metro, it was found that the learning process is still teacher-centered and lacks student involvement, which is not in line with the Merdeka Curriculum that should be student-centered (Pratama, 2018). The learning process still uses conventional methods with media such as blackboards, markers, and printed books (Purwanto, 2016). In class X.7, the identified issue is the low level of student engagement, with 60% of the learning outcomes in the history subject on the topic of the basic concepts of historical science not meeting the Minimum Completeness Criteria (KKM), while only 40% meet the KKM. Additionally, 79% of students only study during history lessons, 65% prefer playing games over studying history, and 61% prefer discussing games rather than history lessons (Ryan & Deci, 2000). As many as 78% of students feel satisfied with their grades despite them being low, which diminishes their motivation to improve their learning outcomes (Purwanto, 2016). According to Purwanto (2016), learning outcomes reflect the achievement of educational goals. Based on this issue, the author plans to implement an educational game based on QuizWhizzer as a learning medium to improve students' learning outcomes (Suhada et al., 2020). Educational games are chosen because of their challenging and interactive nature, which can help students learn while playing and understand the subject matter (Davies, 2001). The success of learning greatly

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depends on the effectiveness of the chosen methods and media, and selecting the right media can support the achievement of learning objectives (Suhada et al., 2020).

RESEARCH METHODS

This research adopts the Classroom Action Research (CAR) method to evaluate the implementation of the QuizWhizzer-based educational game in history subjects and its impact on students' learning outcomes. Darmadi (2015) states that Classroom Action Research (CAR) has unique characteristics in the form of a cycle that distinguishes it from other types of research. PTK is carried out in two cycles that go through four stages: planning, implementation, observation, and reflection.

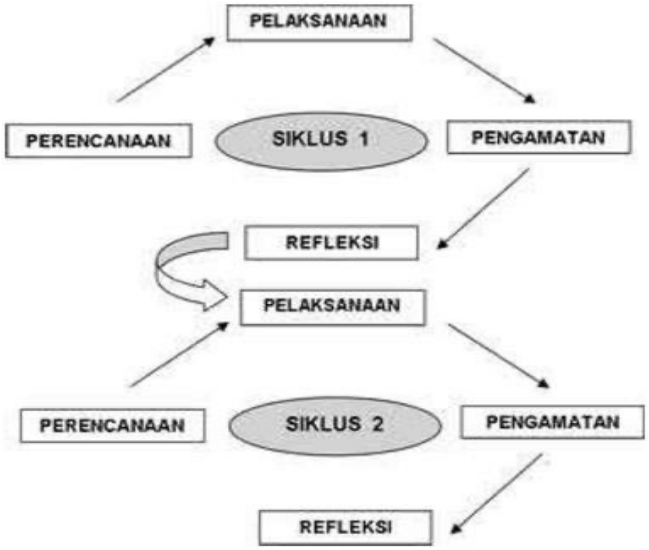

Figure 1. The Kemmis and McTaggart Cycle

This research involves the students of class X.7 at SMA Negeri 2 Metro, totaling 36 individuals. This research was conducted in two cycles, with two meetings. Data was collected through observation, interviews, documentation, and tests. The observation technique was used to record the engagement and motivation of students during learning, using an observation sheet that included students' involvement in the QuizWhizzer sessions and changes in their motivation and interactions.

Interviews were conducted to obtain in-depth information regarding the experiences of students and teachers related to the use of QuizWhizzer, including students' perceptions of the effectiveness of the game and teachers' feedback on its implementation and impact. The test is used to measure students' understanding of history material before and after the implementation of QuizWhizzer, with a pre-test to assess initial understanding and a post-test to evaluate changes in learning outcomes. Documentation includes the collection of data related to the learning process and students' learning outcomes, such as records of QuizWhizzer game results, test scores, learning outcome reports, and documentation of learning activities as well as feedback. The data collected from observations, interviews, tests, and documentation will be analyzed to assess changes in student engagement and motivation, evaluate the impact of QuizWhizzer on students' learning outcomes, and compare the learning outcomes between students using QuizWhizzer and those using conventional methods.

Data analysis techniques include qualitative analysis for observational data. The data analysis process in this research takes place continuously, starting from the observation and continuing after the actions have been completed. The analysis method

used is descriptive, where the researcher details the level of participation and learning outcomes of the students, comparing the conditions before and after the intervention was implemented. The data analysis stage is specifically carried out during the reflection and evaluation phase at the end of each action cycle. This research is considered successful if there is an improvement in the learning outcomes of the students from the first cycle to the subsequent cycles.

RESULTS AND DISCUSSION

RESULTS

The implementation of the Android-based educational game is carried out following the Classroom Action Research (CAR) methodology, which consists of four sequential stages: planning, action implementation, observation, and reflection. The research findings encompass two main aspects, namely the research process itself and the learning outcomes of the students. Next, the research data for each stage that has been completed will be presented in detail.

Description of the Implementation of the Initial Test

The first test will be held on Wednesday, July 31, 2024. At this stage, learning has not yet utilized educational games based on Quizzwhizer. The test consists of 10 multiple-choice questions that have undergone a review and approval process by the relevant subject teacher. The results of this initial test are presented in Table 1.

Table 1. Initial data of students.

No	Name	Pre-Action Value	Completion ≥70		No	Name	Pre-Action Value	Completion ≥70	
			Complete	Incomplete				Complete	Incomplete
1	Akhtar D.M	60		I	19	M. Raihan I.	50		I
2	Albirra M. A	60		I	20	Maharani	60		I
3	Anggita K. P	60		I	21	Muhammad F.	50		I
4	Arya K.	50		I	22	Nabila F. A	60		I
5	Assyifa W. A	60		I	23	Nanda A. F. H	80	C	
6	Bilqis N	60		I	24	Ngurah P. D. A	40		I
7	Brilian P. P	80	C		25	Nindya Z. S	60		I
8	Chantika A. P	60		I	26	Putu D. I. A	70	C	
9	Citra L.	60		I	27	Ramadhan D. P	40		I
10	Dizka A.	60		I	28	Restiana R.	60		I
11	Fahri F.	50		I	29	Riski K. S.	70	C	
12	Fazia T. D	60		I	30	Salsabila F. K	60		I
13	Febiano P. P.	50		I	31	Shabina C. A	80	C	
14	Gadis A. Z	60		I	32	Syifa Ayuri	60		I
15	Imam R. W	40		I	33	Vania P. A	60		I
16	Isabella L. T	70	C		34	Wayan D. Z. S	60		I
17	Khaira M.	60		I	35	Willy Y. G	40		I
18	Legas F. B.	70	C		36	Zafira D. S	80	C	
NUMBER							: 2150		
AVERAGE							: 59.72		
COMPLETION							: 22%		

The minimum completeness level of students is calculated by dividing the total score achieved by all students by the total number of students. Out of a total of 36 students, 8 of them managed to achieve a score of ≥70 (meeting the Minimum Completeness Criteria or KKM), while the remaining 28 students still obtained a score of ≤70. (has not yet met the

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KKM). The classical completeness in this initial test only reached 22%, which falls into the criteria of insufficient achievement. This figure is still far from the established achievement indicator, which is 80% with the criteria of being achieved. This result indicates that the completeness of learning outcomes in a classical sense for the students of class X.7 at SMA Negeri 2 Metro has not yet reached the expected target.

Description of the Implementation of Cycle 1

The first cycle of the research was conducted on Wednesday, August 7, 2024, according to the predetermined schedule from 7:15 AM to 9:30 AM WIB. This activity took place in class X.7 of SMA Negeri 2 Metro, with the researcher acting as the teacher. Mrs. Nanda Lintang Puspita, S.Pd. acts as an observer of student and teacher activities. The learning process follows the guidelines of Teaching Module Cycle I that have been prepared in advance. Observations are conducted simultaneously with the ongoing teaching and learning process. At the end of the learning session, an evaluation is conducted in the form of a test consisting of 10 multiple-choice questions, identical to the questions given in the initial test. The purpose of this evaluation is to measure the learning outcomes of the students in cycle I.

Table 2. Cycle 1 test data

No	Name	Pre-Action Value	Completion ≥70		No	Name	Pre-Action Value	Completion ≥70	
			Complete	Incomplete				Complete	Incomplete
1	Akhtar D.M	60		I	19	M. Raihan I.	60		I
2	Albirra M. A	60		I	20	Maharani	70	C	
3	Anggita K. P	70	C		21	Muhammad F.	60		I
4	Arya K.	60		I	22	Nabila F. A	60		I
5	Assyifa W. A	70	C		23	Nanda A. F. H	80	C	
6	Bilqis N	70	C		24	Ngurah P. D. A	60		I
7	Brilian P. P	80	C		25	Nindya Z. S	60		I
8	Chantika A. P	70	C		26	Putu D. I. A	70	C	
9	Citra L.	60		I	27	Ramadhan D. P	60		I
10	Dizka A.	70	C		28	Restiana R.	60		I
11	Fahri F.	60		I	29	Riski K. S.	70	C	
12	Fazia T. D	70	C		30	Salsabila F. K	60		I
13	Febiano P. P.	60		I	31	Shabina C. A	80	C	
14	Gadis A. Z	80	C		32	Syifa Ayuri	70	C	
15	Imam R. W	60		I	33	Vania P. A	70	C	
16	Isabella L. T	80	C		34	Wayan D. Z. S	60		I
17	Khaira M.	70	C		35	Willy Y. G	60		I
18	Legas F. B.	80	C		36	Zafira D. S	80	C	
NUMBER							: 2420		
AVERAGE							: 67.22		
COMPLETION							: 53%		

The minimum completeness assessment of students is obtained by calculating the ratio of the total scores of all students to the number of students. Out of a total of 36 students, 19 of them successfully achieved a score of ≥70, which means they have passed or met the Minimum Completeness Criteria (KKM). Meanwhile, the other 17 students scored ≤70, indicating they have not passed or have not met the KKM. The classical

completeness on this test reached 53%, which is still categorized as insufficient. This figure is below the established achievement indicator, which is 80% with a satisfactory criterion. This result indicates that the classical completeness of learning outcomes for students in class X.7 at SMA Negeri 2 Metro has not yet reached the expected target.

Description of the Implementation of Cycle 2

The second cycle of the research took place on Wednesday, August 21, 2024, according to the established schedule from 07:15 to 09:30 WIB. The implementation was in class X.7 of SMA Negeri 2 Metro, with the researcher taking on the role of the teacher. Mrs. Nanda Lintang Puspita, S.Pd. is assigned as an observer of student and teacher activities. The teaching and learning process is based on the Teaching Module Cycle II that has been prepared in advance. Observations were made simultaneously with the learning process. At the meeting on the same day, Wednesday, August 21, 2024, the researchers conducted an evaluation. This evaluation consists of a test with 10 multiple-choice questions, identical to the questions given in the initial test. The purpose of this evaluation is to measure the learning outcomes of students in cycle II, with the results shown in table 3.

Table 3. Cycle 2 test data

No	Name	Pre-Action Value	Completion ≥70		No	Name	Pre-Action Value	Completion ≥70	
			Complete	incomplete				Complete	incomplete
1	Akhtar D.M	70	C		19	M. Raihan I.	80	C	
2	Albirra M. A	80	C		20	Maharani	80	C	
3	Anggita K. P	70	C		21	Muhammad F.	70	C	
4	Arya K.	70	C		22	Nabila F. A	80	C	
5	Assyifa W. A	70	C		23	Nanda A. F. H	90	C	
6	Bilqis N	80	C		24	Ngurah P. D. A	60		I
7	Brilian P. P	90	C		25	Nindya Z. S	80	C	
8	Chantika A. P	70	C		26	Putu D. I. A	80	C	
9	Citra L.	80	C		27	Ramadhan D. P	60		I
10	Dizka A.	70	C		28	Restiana R.	80	C	
11	Fahri F.	80	C		29	Riski K. S.	80	C	
12	Fazia T. D	80	C		30	Salsabila F. K	70	C	
13	Febiano P. P.	70	C		31	Shabina C. A	90	C	
14	Gadis A. Z	80	C		32	Syifa Ayuri	70	C	
15	Imam R. W	60		I	33	Vania P. A	70	C	
16	Isabella L. T	80	C		34	Wayan D. Z. S	70	C	
17	Khaira M.	70	C		35	Willy Y. G	60		I
18	Legas F. B.	90	C		36	Zafira D. S	90	C	
NUMBER							: 3215		
AVERAGE							: 89.30		
COMPLETION							: 94%		

The minimum completeness assessment of students is calculated by comparing the total scores achieved by all students against the total number of students. Out of 36 students, almost all of them succeeded in achieving a score of ≥70, which means they have completed or met the Minimum Completion Criteria (KKM). Only a few students have not yet achieved completeness. The classical completeness in the final test of Cycle II reached 94%, far exceeding the achievement indicator set at 80%. This result indicates that the completeness criteria have been met very well. This achievement indicates that the classical

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completion of learning outcomes for students in class X.7 at SMA Negeri 2 Metro has been fully achieved.

The use of QuizWhizzer shows a significant improvement in student learning outcomes. The implementation of the QuizWhizzer-based educational game can enhance student learning results, achieving a classical completeness of 94%. This indicates a significant improvement in understanding historical material; moreover, student activity has become more engaged compared to Cycle I, thus this research was not continued to Cycle III.

DISCUSSION

The research results show a significant improvement in student learning outcomes from the initial test to Cycle II. The classical completeness increased from 22% in the initial test to 53% in Cycle I, and finally reached 94% in Cycle II, with the average score also consistently rising. This improvement is also reflected in the number of students achieving the Minimum Completeness Criteria (KKM), from only 8 students in the initial test to 32 students in Cycle II. The effectiveness of using the QuizzWhizer-based educational game has been proven in helping students understand history material, as evidenced by the increase in classical completeness from 22% to 94%. Additionally, this method has successfully enhanced active student participation in the learning process, especially in Cycle II.

This research successfully achieved the set target of 80% classical completeness, even surpassing it with a 94% achievement in Cycle II. This result has important pedagogical implications, indicating that the integration of technology in the form of educational games can be an effective strategy for enhancing learning outcomes and student engagement in history education.

The application of QuizWhizzer as a learning medium in history subjects shows significant results compared to conventional methods. Based on observations and data, the use of educational games like QuizWhizzer can significantly improve students' learning outcomes. Davies (Tedjasaputra, 2001) notes that interactive games can actively motivate learners, which is clearly evident from the results of observations and increased participation data. Students show greater interest and higher engagement in history learning when using QuizWhizzer.

The learning outcomes of students significantly improved after the implementation of QuizWhizzer. This aligns with research indicating that the use of educational technology can enhance understanding of subject matter through interactive methods (Suhada et al., 2020). The final tests showed that students had a better grasp of historical material and achieved the Minimum Completeness Criteria (KKM) more effectively after using QuizWhizzer.

Experiment 1 shows that conventional methods are unable to meet the needs for student engagement and motivation, resulting in low learning outcomes. In contrast, Experiment 2 and Experiment 3 using QuizWhizzer demonstrate significant positive changes in engagement, motivation, and learning results. This indicates that educational technology, particularly educational games, can be an effective solution to the problems of monotonous and unengaging learning.

Overall, the implementation of QuizWhizzer has proven to be an effective method for improving learning outcomes in history subjects in class X.7 at SMA Negeri 2 Metro. The application of QuizWhizzer offers a more innovative alternative compared to existing conventional methods. This research supports the adoption of educational games as a learning strategy that can enhance the effectiveness of education and motivate students.

CONCLUSION

Based on the description above, the implementation of the educational game based on QuizzWhizer in history learning for class X.7 at SMA Negeri 2 Metro has proven to be effective in improving learning outcomes and the active participation of students. This is evidenced by a significant increase in classical completeness from 22% in the initial test to 94% in the second cycle, as well as an increase in the number of students meeting the Minimum Completeness Criteria (KKM) from 8 to 32 students. This method not only successfully enhances the understanding of historical material but also encourages active participation from students in the learning process. Compared to conventional methods, the use of QuizzWhizer demonstrates advantages in motivating and actively engaging learners, in line with previous theories and research on the benefits of educational technology. The results of this research emphasize that the integration of technology in the form of educational games can be an effective strategy to enhance the quality of history learning, providing a more innovative and engaging alternative for students. Thus, this research supports the adoption of educational games as a learning method that can enhance the effectiveness of education and the motivation of students in history subjects.

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