

A Quiziz Game-Based Learning Implementation in Improving Learner's Critical Thinking Skills

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ABSTRACT

This study aims to determine the effectiveness of game-based learning through Quizizz in improving the learning outcomes of seventh-grade social studies students at SMP Negeri 7 Semarang. The research employed a pre-experimental design, specifically the one-group pre-test-post-test method. Data sources included teachers, students, the learning process, relevant documents, and validators. Data were collected through observations, document analysis, and questionnaires. The data analysis utilized the N-Gain test and the T-Test, with the predetermined minimum completeness criteria. The findings demonstrate that game-based learning through Quizizz is highly feasible and effective.

The validation data indicate that Quizizz as a tool for improving critical thinking skills has a high level of validity, with average scores of 95.7% from media experts, 100% from material experts, and 100% from experts in critical thinking. The N-Gain analysis indicated a 29% improvement in the first cycle, categorized as Less Effective, and an 82% improvement in the second cycle, categorized as Quite Effective. In addition, the significance value of 0.00 indicates a statistically significant difference between the two groups.

Keywords: Game-Based Learning, Quizizz, Critical thinking

INTRODUCTION

Education is one of the efforts to improve the quality of human resources. It is a conscious and planned effort to create a learning atmosphere and learning process, making students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, as well as skills needed by themselves, society, nation and State (Law of Republic of Indonesia Number 20 of 2003 concerning the National Education System article 1 paragraph 1). The world of quality education is expected to support the a smart, skilled, and insightful young generation so that they are able to compete in the global era. The ability to think critically, especially in problem solving is important for students because they can find a real problem or in accordance with the experiences they face, aiming them to make decisions from various points of view carefully and logically (Nurbaya, 2021). In line with this (Changwong et al., 2018) argues that students with the critical thinking skills will get better academic results and be able to face all forms of problem or obstacles in the learning process. One of the lessons that really requires critical thinking skills is social studies because this aims to be able to teach about how to involve sensitivity to social problems and phenomenon that exist in daily life. This requires the students' ability in critical thinking. (Ambarsari et al., 2023) argues that as social study or civic

education, it should be able to realize the ultimate goal of social studies that is able to equip students in solving social problems they face as well as a form of implementation of realizing the colour of a good country. In order to realize its goals, the skills of social studies done by the teachers in integrating educational models on social studies learning is required in the classroom or learning activity.

Based on initial observations conducted in seventh-grade students of SMP Negeri Semarang, it revealed that social studies learning students are able to present a good level of memorization, but they did not comprehend the subject matter well. Most students found difficulties in understanding the concepts, they were not able to connect the material learned with the knowledge they must understand. In line with research by (Nuraisah, E., Irawati, R., & Hanifah, 2016) stated that learning by using a conventional approach cannot increase student learning motivation in the classroom. In addition, students seem to tend to be more passive, shy, and afraid to ask the teacher in their learning activities. They were less motivated and excited in social studies learning activities. The low critical thinking skills among seventh-grade social studies students in class VII B at SMP Negeri 7 Semarang are evidenced by the analysis of daily test results, which reveal that the questions mainly assess lower cognitive levels, such as remembering (C1) and understanding (C2). Of the 44 students, 24 scored below the minimum competency level (*KKM*), which is set at 75. Additionally, teachers seldom incorporate questions that foster critical thinking, such as those related to problem-solving and reasoning. In accordance with research conducted by (Arif et al., 2021) that the use of educational game website media in online learning using Quizizz media and Crosswords shows the results that it can shape students' critical thinking in learning process. The media used is able to stimulate the intelligence process and critical thinking ability of students with various scientific

content in it making the students not only remember (C1) and understand (C2) what they learn, but students are able to be active in problem solving during the learning process.

Radityastuti et al., (2023) concluded that critical thinking and mathematical problem-solving skills through digital game-based learning model are better than non-digital game-based learning model and problem-based learning model. In addition, after using the digital game-based learning model, critical thinking and problem-solving skills increased to a moderate level. The low critical thinking skills of students in social studies at seventh-grade B SMP Negeri 7 Semarang was supported by the results of daily test documentation identifying that the daily test questions were still at the cognitive level of remembering (C1) and understanding (C2). These results indicate that 24 (twenty-four) students out of 44 students got below or under the minimum completeness criteria (*KKM*) with a score of 75. Besides, teachers rarely gave questions in the form of developing critical thinking skills, such as problem solving and reasoning. By using the Quizizz Game, students can do exercises in class on their electronic devices. Quizizz has game characteristics, such as avatars, themes, memes, and entertaining music in the learning process. Quizizz also allows the learners to compete with each other and motivates them to learn so that learning outcomes can improve. Learners take the quiz at the same time in class and examine their live ranking on the leaderboard. Instructors or teachers can monitor the process and download the results when the quiz is over to evaluate students' performance.

Research conducted by (Anggita & Nisa Lubis, 2023) explains that critical thinking is one part of the results obtained by students in the learning process at the stage of their cognitive aspects. The use of learning models to influence the level of critical thinking of students must be effective and interesting. Social studies

learning design should be directed and focussed in accordance with the conditions and potential development of learners so that the learning carried out is truly useful and beneficial for students. As in this era of revolution 4.0, the learning process must be oriented to the interests of learning learners (student centred). In this era, learning activities need to shift from conventional to more innovative and creative by utilizing better learning technology.

Learning innovation is not only one of the supporting factors in learning process, but facilities are also a supporting factor of the learning process. In line with research conducted by (Haliza, R. A. N., Rulyansah, A., & Hartatik, 2022a) suggests that if a teacher effectively utilizes the available resources during classroom instruction, the majority of the intended learning objectives are likely to be fulfilled. This is because the facilities provided by the school have the potential to enhance both the quality of education and students' motivation to engage in learning (Chayani, L., & Januardi, 2019).

Research conducted by (Saputra, 2021) explained that the use of educational game media provides its own excitement and fun for students in completing the game interactively as they have the freedom to control the player to collect maximum scores, complete challenges to maintain the player's life, as well as compete with other groups in completing the game in the fastest possible time. Based on this explanation, the learning process requires a creative, efficient, and flexible learning media that must adapt to the characteristics of students, the development of students, the competencies that must be achieved, and the current educational conditions so that learning becomes more embedded and meaningful in students. One of the efforts to foster a learning atmosphere that is creative, effective, and able to improve critical thinking skills is through the utilization of learning media that can be accessed easily by teachers and students anywhere and anytime. The utilization of game-based

learning in social studies learning helps students in the learning process independently. Therefore, based on some previous research results related to the background of the problem, it is necessary to implement interactive learning to help students in mastering critical thinking skills in social studies learning. In this study, the researcher explored and applied Game Base Learning Quizizz in learning process to determine the critical thinking skills of students in seventh-grade students of SMP Negeri 7 Semarang.

LITERATURE REVIEW

Game-Based Learning

The implementation of Game-Based Learning method in a learning process requires the teacher's ability because he will involve technology as a learning medium to help achieve goals in the learning process. Akhiruddin, (2019) explains that learning is an effort that deliberately involves and uses the professional knowledge of the teacher to achieve curriculum objectives. Game-Based Learning is a learning model intended to combine learning materials with education so that students can be actively involved in learning activities (Nur'Aini, 2018). This model can be one of the new innovations to create an interesting learning environment and attract learners' interest, which in turn will help them understand the material better (Nur'Aini, 2018).

Quizizz

The game-based educational app of Quizizz brings multiplayer activities to the classroom and makes classroom exercises more interactive and fun. It allows students to use their electronic devices for class exercises. Quizizz also entertains students during the learning process with its game features, such as avatars, themes, memes, and music. This sets it apart from other educational apps. On the leaderboard, students see their quiz results instantly. In order to assess student performance, instructor or teacher can supervise the procedure and download the report after the

quiz is over. This app increases students' interest and improves their concentration (Purba, 2020). This is in line with what was stated by (Dewi, 2018) that game-based learning may serve as a medium.

Social Studies Learning

In essence, social studies refer to a compulsory subject in primary and secondary schools, including various interrelated social science disciplines. Therefore, social studies have a context of understanding that is not much different from the social sciences because the concepts of social studies are the result of a combination of various concepts of the social sciences. Social studies education aims to encourage students to become more professional and master functional knowledge and skills. Social studies learning is applied as an implementation of social studies education with a focus on value transfer rather than just knowledge. In schools, the coverage of subject matter is usually organized based on a material structure consisting of knowledge, skills, and attitudes. This structure has an impact on the learning process that prioritizes the dissemination of knowledge. As a result, learning or education goals are often limited to improving mastery of knowledge and skills. In other words, education often ignores the goal of forming attitudes and personalities (Pramono, 2013).

Critical Thinking

The development of concepts and ideas is known as thinking (Rif'at, 2021). When conducting learning activities, students are asked to think about the objects they given (subject matter), and their task is to open their eyes to these objects. Students must realize that certain objects or materials are not simple; they must understand them, compare with what they see, and always analyze them. In the 21st century, critical thinking skills are very needed. It is the ability to analyze and evaluate information obtained from observation, experience, reasoning, and communication to decide

whether the information can be trusted or not. (Purwati, R., Hobri, & Fatahillah, 2016) defines critical thinking as the ability to evaluate the reliability of ideas, problem solving, as well as overcome problems and shortcomings of these ideas.

MATERIALS AND METHODS

This type of research is experimental research, which defined as one group pre-test-posttest pre-experiment research. This research did not use a comparison class but used an initial test so that the magnitude of the influence in using Quizizz game-based learning on students' critical thinking skills can be known with certainty. In this study, research subjects were first administered an initial test (pretest) to determine the extent of the initial ability of students before being given social studies learning using Quizizz game. After conducted an initial test (pretest), then students were given treatment (treatment), namely social studies learning using Quizizz game-based learning. The subjects in this study involved 30 (thirty) seventh-grade students, consisting of students of class VIIB SMP Negeri 7 Semarang. Data analysis techniques in this study used expert test, validity test, reliability test, N-Gain test, and hypothesis testing.

RESULT AND DISCUSSION

Quizizz as one of the game-based learning media is the media used by teacher to evaluate the learning process. This provides statistical information about students' learning outcome and can be downloaded in the form of excel file. The use of Quizizz helps teacher evaluate the students' learning process without being limited by place, provide a fun display, and setting the time to work on questions leads to student concentration (Wihartanti, L. V., Wibawa, R. P., Astuti, R. I., & Pangestu, 2019). Quizizz can be useful game for every teacher to evaluate their students and make it easier to quickly find out the results of the scores obtained because the data resulted on Quizizz can be accumulated immediately.

Moreover, students will also be more interested in trying new things and of course become enthusiastic so that it will improve their evaluation. The results of the analysis of the validity, feasibility, and improvement of the items used in this study reveal that:

Aspect of expert validation

In this study, the instrument used was tested with construct validity testing, that was carried out by expert (expert judgement).

Expert who validates this instrument are Dr. Agustinus Sugeng Priyanto, M.Si. and Ferani Mulianingsih, S.Pd., M.Pd. as the lecturers from the Department of Social Studies Education, Undergraduate and Master Program of Universitas Negeri Semarang. The feasibility of the module made can be seen through the results of validation by experts (expert appraisal), through validation of experts using questionnaire, the data obtained as follows.

Table 1. Score of media expert validation result

No.	Evaluated Aspect	Score	Maximum Score	Percentage (%)
1.	Graphic feasibility	138	145	95.1
2.	Presentation feasibility	44	45	97.7
∑ Score		182		
∑ Maximum Score		190		
Score Percentage (%)		95.7		
Criteria		Very valid		

Based on the overall media evaluation criteria with a score of 95.7, the predicate is very feasible to use for research. The table above shows that the results of media validation of the module on the instrument used in the study. In the validation process by media experts, several aspects were assessed including aspects of graphic and presentation feasibility. The total score

successfully obtained to assess the feasibility of the media is 182 out of a maximum value of 190. This means that the percentage of media feasibility of the instrument reaches 95.7% and the category is included as "Very Valid" with several revisions need to be done. Furthermore, the test expert validation found the following results:

Table 2. Score of expert validation results

No.	Evaluated Aspect	Score	Maximum Score	Percentage (%)
1.	Clarity	10	10	100
2.	Content eligibility	10	10	100
3.	Relevance	5	5	100
4.	Content validity	5	5	100
5.	Unbiased	10	10	100
6.	Language clarity	15	15	100
∑ Score		55		
∑ Maximum Score		55		
Score percentage (%)		100		
Criteria		Very valid		

Based on the overall test assessment criteria with a score of 100%, it gets a very valid predicate to be used as research. In the validation process by experts, several aspects were reviewed, namely the clarity of the items, feasibility of content, relevance, validity of content, unbiasedness, and clarity of language on the items. The total score

obtained to assess the feasibility of the items was 55 out of a maximum score of 55. The percentage of the feasibility of the question items on the critical thinking instrument reached 100% and was categorized as "Very valid". Then, the results of the validity test by material experts found the following results:

Table 3. Score of material validation results

No.	Evaluated aspect	Score	Maximum Score	Percentage (%)
1.	Content eligibility aspect	60	60	100
2.	Presentation feasibility aspect	40	40	100
3.	Aspects of language appropriateness	55	55	100
4.	Contextual assessment aspects	50	50	100
∑ Score		205		
∑ Maximum Score		205		
Score percentage (%)		100		
Criteria		Very valid		

Based on table above, the results of material feasibility validation by material experts. In the validation process by material experts, several aspects were evaluated, including content feasibility, presentation feasibility, language feasibility and contextual assessment. The total score obtained from the feasibility of the material is 205 out of a maximum score of 205. The percentage of material feasibility of the critical thinking instrument reached 100% and can be categorized as "Very valid". The analysis results regarding the validity aspect reveal that all sets of teaching materials used in this study (suitability of critical thinking teaching materials, content of critical thinking teaching materials, presentation structure of critical thinking teaching materials, learning implementation, and student activity observation sheets) have fulfilled the validity aspect because they are in accordance with the validator's suggestions. This is in line with research conducted by Anggita & Nisa Lubis (2023) that critical thinking is one part of the results obtained by students in the learning process at the stage of their cognitive aspects. The use of learning models to influence the level of critical thinking of students must be effective and interesting. Social studies learning design, must be directed and focussed in accordance with the conditions and potential development of learners so that the learning carried out is truly useful and beneficial for them. As in this era of revolution 4.0, the learning process must be oriented to the interests of learning learners (student centreed). In this era, learning activities must change from conventional to more innovative and

creative by utilizing better learning technology. Learning innovation is not only one of the supporting factors in learning, but learning facilities are also a supporting factor of the learning process. In line with research conducted by (Haliza, R. A. N., Rulyansah, A., & Hartatik, (2022) that if a teacher is able to make the most of the facilities that have been available during the classroom learning process, the learning objectives that have been designed will mostly be achieved. The facilities provided by the school can develop and improve the quality and desire of students in the world of education (Chayani, L., & Januardi, 2019).

The improvement of critical thinking skills

Learning through Quizziz Game-based Learning aims to determine whether there is an increase in the critical thinking skills of seventh grade students on economic activity material. This study utilized an experimental design, namely One group pretest posttest design. The research was first carried out in the experimental class, the first step taken by the teacher aimed to convey the material in outline, then the students could study themselves in its outline, during learning process, the students looked calm and followed the learning well. This can be seen from the teacher and students doing questions and answers. After the delivery of the material completed, students were asked to read and understand the material that has been delivered by the teacher. Then students were then stimulated to express statements related to the existing material, then students were given the opportunity to work on how many Quizziz questions that had

been prepared.

Based on the results of the N-Gain calculation, it was obtained 0.29 with a low category in Cycle 1, and also a result of 0.82 with a high category in Cycle 2. In addition, the use of Quizizz media in the learning process also received a positive response from students of seventh-grade B SMP

Negeri 7 Semarang, as shown in the results of the Response Questionnaire from students with an acquisition of 80% with an Excellent category. The following is a table and graph of the improvement of students' critical thinking skills seen from Cycle 1 and Cycle 2, as well as a table of students' response questionnaires as follows.

Table 4. N-Gain score of cycle 1

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
NGain	29	-.50	.67	.2967	.27223
Valid N (listwise)	29				

Table 5. N-Gain score of cycle 2

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
NGain	29	.50	1.00	.8251	.17441
Valid N (listwise)	29				

In line with the data from the tables above, the level of students' critical thinking skills during the two cycles has increased. In Cycle 1, there was an increase of 29% with the category of Less Effective, but it increased in Cycle 2 by getting the results of the N-Gain acquisition of 82% with the category Quite Effective, according to the category Hake R. R, 1999.

These results not only corroborate with the research findings, but also help to identify significant differences before and after the

treatment in the experimental class. Furthermore, these results have elaborated in more depth to provide a more comprehensive understanding of the impact of the tested variables on the study population. Thus, this proportion of tests and statistical analyses are considered appropriate in achieving the expected teaching objectives in this study. The following are the results of the T-Test testing in the study.

Table 6. Test of differences in Pretest and Posttest

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before treatment	51.6000	30	14.56874	2.65988
	After treatment	91.4667	30	9.26146	1.69090

Paired Samples Correlations								
		N	Correlation	Sig.	t	Std Deviantion	df	Sig. (2-tailed)
Pair 1	Before and after treatment	30	.293	.116	-14.755	14.79919	29	.000

The data in the table indicate a significant difference before and after treatment in the test results. The experimental class before the treatment recorded an average score of 51.6000, while the average score in the experimental class is 91.4667 after the treatment. The significance result shows a value of 0.00, indicating a significant

difference between before the treatment and after the treatment. This finding provides evidence that the treatment in the experimental class showed a positive impact on the observed results. Then, the T-test results show that Ha is accepted. Thus, there is a significant effect of learning using Game Base Learning Quizizz on improving

the critical thinking skills of students in seventh-grade B SMP Negeri 7 Semarang. Based on the results of the experiments that have been carried out, that the results of this experiment have a positive impact on students in learning. Learners no longer feel bored when learning social studies. Besides, the critical thinking skills of students also increase. This is evidenced by cognitive assessment in the form of pretest and posttest results. The results of this study are in line with research conducted by Cicchino (2015), which explains how Game-Based Learning affects critical thinking skills in student discourse in a traditional classroom environment. This study examined student discourse during a Game Base Learning intervention designed to promote content knowledge and critical thinking skills in eight-grades social studies learning. The results revealed that Game-Based Learning intervention features and specific games were effective in promoting higher-order critical thinking skills, including the development of independent knowledge before learners engaged in collaborative discourse among learners, and this study has implications for Game-Based Learning developers. The researchers, who are interested in exploring Game-Based Learning and teachers who want to integrate Game Base learning into learning. In addition, research conducted by Arif (2021) explained that the use of Quizizz media and website-based Crosswords can shape critical thinking when answering questions in quiz. This is evidenced by observation or via zoom when the work is being started. Not only that, observations also examine the final results of work in students answering Quizizzes and Crosswords. The use of educational game website media in online learning with these media shows the results that they are able to shape students' critical thinking in online learning and stimulate the process of intelligence and thinking ability of students with various scientific content.

CONCLUSION

The utilization of Game-Based Learning Quizizz to improve students' critical thinking skills is feasible to use in social studies learning. The results of the validity, reliability, and expert tests indicate the good results for this research. The validity test result utilized product moment correlation assisted by SPSS 25 software, then 25 questions on the pretest and post test were declared valid, so that 25 questions were used for research. The reliability test results found that reliability has a Cronbach alpha value of 0.695, it can be concluded that it has a sufficient category. Then, the media feasibility percentage results, based on the overall media assessment criteria with a score of 95.7%, get a predicate of very feasible to use for research. The percentage result of material feasibility of the critical thinking instrument reached 100% and can be categorized as "Very valid". Meanwhile, the results of the feasibility percentage of question items on critical thinking instruments also reached 100% and were categorized as "Very valid". 3. These indicated that there is an increase in critical thinking skills assessed from the learning outcomes of students. Based on the results of the analysis using N- Gain, there is an increase of 29% with the category Less Effective in Cycle 1 and it increased by getting the results of N-Gain acquisition of 82% with the category Quite Effective in Cycle 2. The use of Game-Based Learning Quizizz in social studies learning has an effect on increasing students' critical thinking skills because the results of the independent sample t-test hypothesis test are the results of $0.00 < 0.05$, so H_a is accepted.

Declaration by Authors

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