



## Effectiveness of Quizz-based Edugame as Learning Support Media for Improvement of Learning Outcomes

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### Abstract

The study discusses the effectiveness of using quiz-based edugame to improve student learning outcomes in the context of increasingly rapid technological developments. The negative impact of technology in the world of education is the decline of students' interest in learning because they are more interested in playing games than learning. Therefore, the emergence of innovation to use games as educational materials to attract student interest and motivation. The purpose of this study was to determine the impact of using edugame as learning media on students' learning outcomes. The method in this study uses the SLR (systematic literature review) method by analyzing articles from google scholar in the publication year 2021-2025 with a focus on the use of edugame in formal learning at the elementary, junior high, and high school levels. This study only covers Android-based or digital edugame and does not examine in depth external factors such as economic background or parental support for the effectiveness of edugame. The results of the analysis show that the use of quiz-based edugame has a positive impact where the increase in students' learning outcomes reaches 13.7% to 35% compared to usual learning, besides that edugame also increase students' interest and motivation to learn, therefore edugame can be an alternative for educators to utilize in an effort to improve students' learning outcomes.

### Keywords

edugame; learning support media; quizz

## INTRODUCTION

Education is one of the most important things to support the development of a country, a developed country certainly has a high quality of education. Because with the existence of quality education will give birth to a quality generation, namely people who have a strong attitude and mentality, creative and innovative in thinking and acting (Sukma & Handayani, 2022).

According to the results of Indonesia in PISA (Program for International Student Assessment), it is still in a very low category, with the results showing Indonesia position 74 out of a total of 79 participants in 2018, and in 2022 the acquisition score of Indonesia got a score of 366, which shows a decrease from 2018, which then got a score of 379 (Afidah & Subekti, 2024). From these results, it shows that the achievement level of Indonesian students is still low, this can be caused by several influencing factors, one of which is the lack of student interest in learning. Interest in learning is a driving factor in students' desire to understand material, with low interest in learning can have an impact on students' learning outcomes, which in fact students are now more interested in playing games than learning. This is shown by the survey results on the duniaku.net platform, it is said that 12% of game players are 13 years old and below, 70% are 13-24 years old and 10% of players are 25-34 years old and the rest are 34 years old and above and a survey conducted by Niko partners in (Sariyanto et al., 2025) which states that as many as 180 million Indonesians are actively playing games. This shows the average game enthusiast at the age of elementary, junior high to high school students.

The development of technology can have both bad and good effects on individuals, on the one hand, technology can provide very wide access to information, but on the other hand, the use of this technology is often used only to find pleasure, such as playing games, which has now become a phenomenon that many students are more interested in playing games than studying. This condition is a challenge as well as a great opportunity that can be used by educators to increase student interest, motivation, and learning outcomes through games by facilitating them as learning media. This is supported in research conducted by (Bima & Marline) that 86% of students in one of the schools in Karawang area support the use of games as a learning medium that can increase student interest and learning outcomes. The designed edugame is not only entertaining but also an effective teaching aid that can be used at elementary, junior high or high school education levels, so that students are not only fixated on games for fun which can have a bad impact, but students can play games and learn at the same time, it can be a solution to addiction or interest of students who are interested in playing games from bada to learn.

One of the educational games that can be used as teaching material is a quiz game where students can answer questions in the game related to the material being studied. A quiz game is an interactive game that is creatively presented so that it seems to attract students to answer questions in the subject matter of the material being studied

(Pascawindra & Mahpudin, 2024). Quiz games can also be used as an interesting and interactive assessment media for students that can increase motivation so that students feel enthusiasm in working on the questions displayed (Yuniani et al., 2023). Educational quiz games can be used by using provided platforms such as word wall, quiz or by developing their own edugame applications.

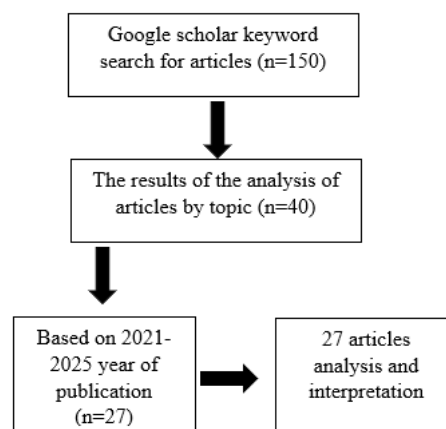
There have been many studies on the use of quiz-based edugames to improve student learning outcomes, one of which is research conducted by (Nurfadilah et al., 2021) with the results of an increase in learning outcomes and quiz educational games are said to be an alternative to be used in learning to improve student learning outcomes. In addition, the research (Lestari et al., 2022) also experienced an increase in learning outcomes and student activeness in learning. Although the use of edugames in learning has been widely discussed, there are still research gaps related to the effectiveness of quiz-based edugames in improving learning outcomes and their effect on interest and motivation to learn. In addition, the use of edugames is still uneven across educational levels, which is a particular concern of this study. Therefore, the researcher intends to review the various studies that have been conducted that discuss the use of quiz-based edugames in improving learning outcomes at the elementary to high school levels, with the intention of identifying the effectiveness of using edugames as learning media and providing an overview of the trends in their use at different levels of education. The results of the study are expected to be a reference for educators in providing learning with appropriate and effective media, so that it can be an impetus for efforts to improve learning outcomes.

## **METHOD**

This study uses the SLR (systematic literature review) method, which is the collection of information by identifying, reviewing or examining, evaluating, and interpreting all research articles systematically used (Sari et al., 2023). Using this method, the researchers identified research articles relevant to the topic of discussion, namely the effectiveness of quiz-based edugames as a learning support for improving student learning outcomes at the elementary, junior high, and high school education levels on the google scholar website with the keywords used, namely: edugame, quiz game, and improved learning outcomes. Initial results were obtained as many as 40 articles that had relevance to the titles and keywords used, then filtering was carried out by evaluating the titles and abstracts of articles that had relevance to the topic and inclusion criteria used, including: the year of publication

of the article between 2021-2025, the level of education at elementary, junior high, and high school or equivalent, the type of edugame, and the research results that were in accordance with the topic of discussion, namely improving learning outcomes. There were 27 articles that could be used or included in the inclusion criteria, while the remaining 13 articles did not meet the inclusion criteria where the year of publication was outside the specified year range or before 2021, the research results did not focus on learning outcomes, and the lack of relevance of articles that did not include digital-based edugames, so they were not used in the next stage.

Based on the 27 articles obtained, qualitative analysis was then carried out to obtain pattern data and comparisons regarding the effectiveness of using edugames with quiz-based edugames on improving student learning outcomes, so that researchers can draw conclusions about the use of quiz-based edugames as learning media and identify the relationship that exists between edugames and the achievement of student learning outcomes, which can then be presented in the form of narratives and tables to show gaps, the effectiveness of edugames as learning media.



**Figure 1.** Diagram of the systematic review process

## RESULT AND DISCUSSION

The findings of the researcher from the search results with keywords that match the topic of discussion are 27 articles that will then be analyzed, the aim is to get the results of identifying the studies that have been done that explain the results of the effectiveness of quiz-based educational games on student learning outcomes with general subjects and different materials to show the results of the use of educational games effectively used in learning.



**Figure 2.** Number of articles by level of education

Based on the sample grouping, there is a visible difference that the elementary education level is more dominant than the junior high school and high school level or equivalent. 18 articles are from elementary education, 4 articles are from junior high school, and 5 articles are from high school.



**Figure 3.** Percentage of articles in the Edugame category

Based on the percentage of edugame categories in the selected research articles, there are 40.8% in the quiz-based edugame category and 59.2% of edugame research articles other than in the quiz-based edugame category. Where as many as 16 articles based on quiz games and 11 other articles educational games do not include quiz. After the grouping step, the next step is to review and identify the research findings.

**Table 1.** Analysis of the effectiveness of Edugame in improving learning outcomes

Researchers	Journal	Results
(Maftuhah, 2023)	Journal MIEJ	In the first test, the average score of the class was 79, while in the second test, the average score increased to 85. This proves the effectiveness of edugame in improving the learning results, besides that it can also increase

(Pascawindra & Mahpudin, 2024)	ITC Learning	the enthusiasm and motivation of the students in learning. The increase in the average score was 6% of the previous score. Media can be a source of encouragement and motivation for students to learn course material.
(Putra & Suprianto, 2021)	Pendidikan Teknik Elektro	There was an increase in scores from the previous average of 75 to 79.4. It can be concluded that there was an average increase of 4.4% from the baseline.
(Septiani & Sundi, 2024)	Pedas: Ilmiah Pendidikan Dasar	Based on the results of the t-test analysis, there is a difference between the experimental class and the control class in terms of learning outcomes.
(Nurmayanti & Kurniawansyah, 2025)	JIPP: Journal Ilmiah Profesi Pendidikan	The percentage obtained in Cycle I was 62% and in Cycle II it increased to 79%. It can be said that the edugame media used are effective in improving the learning results, which have increased by 17% compared to the initial conditions.
Improvement in the learning outcomes that occur		4,4% - 17%
Average Improvement		9,13%

Based on the results of the analysis of the article, it is true that the effectiveness of edugame as a media in an effort to improve student learning outcomes, where there is a difference in results between learning without using edugame media and when using edugame, which is very clear that there is an increase in learning outcomes. The increase from initial conditions to when using edugame media that occurred was 4.4% to 17% with an average increase of 9.13% from the results of the analysis that has been carried out from research on the use of edugame as a learning media to improve student learning outcomes. In addition, edugames can also increase students' interest in learning as described in research (Lubis & Nuriadin, 2022) and in other studies that mention media edugames that can attract and motivate students in learning including (Hadi et al., 2024; Nurhayati et al., 2025; Ella et al., 2024) and can make learning more active and fun which is said in research (Sumarsih, 2024).

**Table 2.** Analysis of the effectiveness of quiz-based Edugame in improving learning outcomes

Researchers	Journal	Results
(Lestari et al., 2022)	Educatif	In the initial condition there were 11 students who completed the KKM score, in cycle I it increased to 15 students and in cycle II to 24 students who

(Nurfadilah et al., 2021)	Literasi Digital	completed. Based on the initial conditions with the use of quiz-based edugame, there was an increase in students who completed the learning outcomes by 13 students. The average pre-test score for students was 45, while the average post-test score was 80, an increase in average score of 35%.
(Yuniani et al., 2023)	JSIT: Science instruction of technology	Student learning outcomes increased from an average of 67.6 in Cycle I to 82.3 in Cycle II. The difference in mean scores was 14.7.
(Dhuha et al., 2024)	Mandalika	There was a 13.7% increase from the control class to the experimental class. The average increase was from 71.3% to 85%.
(Nopriansyah & Ismanuar, 2024)	Terampil	A total of 10 students scored above 80 in the first cycle, then increased to 16 students scoring above 80 in the second cycle. The addition of complete students in the first and second conditions was 6 students.
(Nafisaturrafiah et al., 2021)	Literasi: Journal Pendidikan Dasar	The acquisition value of the pre-test and post-test experienced a difference with an increase in value from an average of 64 to 86. Thus, researchers convey that edugame quizz media can improve student learning outcomes. With an increase in the average score that occurred by 22.
Improvement in the learning outcomes that occur		13,7% - 35%
Average Improvement		21,4%

The results of the analysis of these articles can be said that there are differences in students' learning outcomes in the initial conditions, the first cycle and the second cycle, this difference turns out to be an increase in value, which proves that quiz-based edugame learning media has an impact on improving students' learning outcomes. Based on the analysis table, it can be said that the improvement in learning outcomes that occurred in the research on the use of quiz-based edugame, which was carried out with an increase of between 13.7% to reach an increase in value of 35% from the initial conditions and the addition of students who can be completed from the KKM value, which previously had a value below KKM as many as 6-13 students can improve learning outcomes through quiz-based edugame media. In other words, the increase in student learning outcomes that

occurred when using quiz-based edugame media had an average increase of 21.4% and an average increase in students who reached the full score of 9 students.

Quiz-based edugame is proven to be able to improve students' learning outcomes as in research (Dermawan & Ramadhan, 2024) who states that edugame quiz media is an easy and practical media to use in learning because students' scores can be seen immediately when they finish working on it. According to (Agita & Arifin, 2021) who also stated that edugame is a practical and effective media used in the learning process because it received a very large response where 89% of students in their research said the edugame media was very good.

## CONCLUSION

The use of quiz-based edugame media in learning has a good impact on improving students' learning outcomes, as well as increasing students' interest and motivation in learning. The use of this edugame tends to be applied at the elementary school level, and at the junior and senior high school levels it is said to be used almost equally. The average increase in learning outcomes that occurs in the use of edugames other than quiz as learning media is 9.13%, while in quiz-based edugames it is 21.4%, this shows that the use of quiz-based edugame media is more widely used and the increase in learning outcomes is greater than the use of other edugames, so quiz-based edugames can be an alternative as learning media in an effort to improve students' learning outcomes. Due to the effectiveness of quiz-based edugame in learning, which can have a positive influence on students' learning outcomes for educators, it is hoped that the use of edugame as a practical and effective learning media can be further optimized in the future. From these results, for further researchers can develop more interesting edugame innovations such as combining edugame quiz with others in one application media so that it can further optimize the results to be achieved and for other literature review researchers can add more literature not only focusing on Google Scholar database so that they can analyze more literature to get stronger results regarding the effectiveness of edugame on improving student learning outcomes.



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