

The Utilization of Wordwall-Based Educational Games on Elementary School Students' Mathematics Learning Outcomes: A Systematic Literature Review

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Keywords

Wordwall
Educational media
Learning outcomes
Mathematics
Elementary School

Abstract /

This study aims to find out the extent to which the use of Wordwall-based educational media affects the mathematics learning outcomes of elementary school students. The method used is qualitative with the Systematic Literature Review (SLR) approach, whose data was collected as many as 10 articles using sources from Google Scholar (2021–2024). The results of the study show that the use of Wordwall media in mathematics learning has a significant positive effect on improving students' understanding and learning achievement. Wordwall is able to create a more interactive and fun learning atmosphere, thus encouraging active student engagement. However, the success of this media implementation is highly dependent on the ability of teachers to manage it. Therefore, it is necessary to improve teacher competence and support from schools so that the use of Wordwall can be more optimal in the learning process.

1. Introduction

Mathematics plays an important role in the world of education, especially at the elementary school level because it is the basis of various skills needed to develop students' cognitive abilities. Mathematics education is a discipline that aims to teach students logical, systematic, and analytical thinking to solve everyday problems. Math learning is the process by which teachers, students, and other elements interact to improve students' thinking and problem-solving skills (Gusteti & Neviyarni, 2022). However, the mathematics learning process at the elementary level still faces a number of challenges. Lack of interest has a direct impact on students' levels of understanding and learning outcomes. Therefore, a learning strategy is needed that is able to increase interest and understanding of mathematical concepts in a more concrete way. To support this, one of the strategies that can be applied is the use of interactive media in the learning process. This is in line with the opinion conveyed by Mai Sri Lena et al. (2023), which states that the use of learning media can make the learning process easier to understand and more interesting for students, especially if it involves image media. Therefore, the integration of technology that is relevant to the development of the times is an important key in creating fun and effective learning.

Learning media is any form of aid used in the teaching and learning process to support the delivery of subject matter. In the context of mathematics learning, the existence of this media is very helpful for students in understanding the concepts taught. The selection of appropriate learning media by teachers plays an important role in determining the effectiveness of achieving student learning goals (Magdalena et al., 2021). Interactive learning media has great potential to change the dynamics of learning in the world of education, especially in teaching mathematics subjects. By combining engaging elements of play, this approach can increase student engagement in the learning process. This has the potential to motivate them to be more enthusiastic and interested in understanding mathematical concepts that might be considered difficult or boring. Thus, the use of interactive learning media can be an effective way to increase students' interest and motivation in learning mathematics (Safitri et al., 2020).

One example of educational games that can be applied in mathematics learning is *Wordwall*. *Wordwall* is an interactive media designed to support learning activities. By using this application, teachers not only to deliver material, but also to assess and evaluate student learning outcomes in a more effective and engaging way. Game users can choose the template they need for free on the

platform. The diverse selection of games within the platform provides an enjoyable experience for students. The variety of games available includes a variety of interesting activities, including playing quizzes, matching and matching words, searching for words, shuffling words, and other activities that are no less exciting. *Wordwall* offers a variety of game examples that can make it easier for users, especially for those who are using it for the first time (Gandasari & Pramudiani, 2021). Although the platform offers a lot of variety in the form of games, teachers' interest in its use tends to be low, as many of them prefer the platform *Quizizz*. Based on Mulyati and Evendi's research (2020), *Quizizz* It is becoming a popular choice among teachers, especially in math teaching, as the platform allows for more interactive and fun quizzes. With this condition, it is important to conduct further research regarding the use of media *Wordwall* in the context of mathematics learning.

This study aims to compile an in-depth literature review of various relevant studies regarding the use of *Wordwall* media in mathematics learning. Based on various existing findings, a number of previous studies have shown the many benefits that can be obtained through the use of *Wordwall*, which prompted the author to select several articles that review how the use of *Wordwall*-based educational media games can affect mathematics learning outcomes at the elementary school level. Thus, it is hoped that the findings of this study can contribute to the development of more interesting and effective mathematics learning methods for students.

2. Method

In the preparation of this scientific article, the author uses a qualitative research method with the Systematic Literature Review (SLR) approach, or commonly referred to as a systematic literature review in Indonesian. The collected articles are those published between 2021 and 2024. The data collection procedure in this study uses the PRISMA (Preferred Reporting Item for Systematic Reviews and Meta-Analysis) flow, which starts with identification, screening, eligibility, and included. The flow diagram of the PRISMA in this study is shown in Figure 1

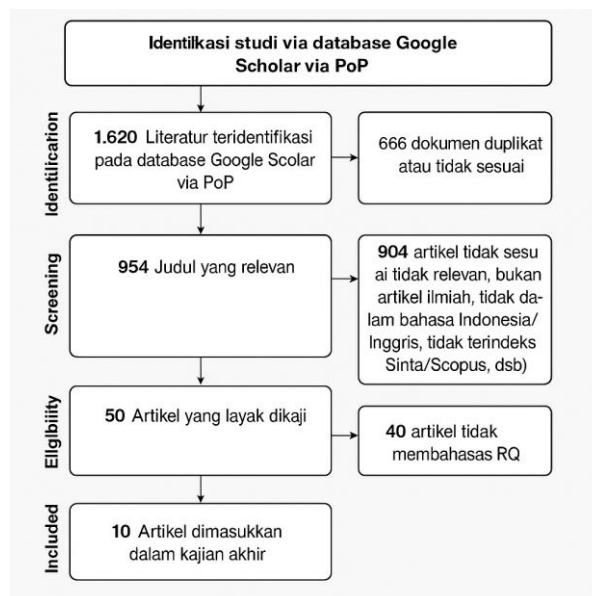


Figure 1. Primeval Flow Diagram

Source: Processed Research, 2025

2.1 Identification

The purpose of this study is to see how the use of wordwall media has an impact on the mathematics learning outcomes of elementary school students in published articles. The Google Scholar application is used to search for the data of the articles to be analyzed, aiming to find relevant sources. The article search was conducted using the keywords "Wordwall, Educational media, Learning outcomes, Mathematics, Elementary School" in the Google Scholar database. 2021–2024,

this search found 1620 related literature. This search found 1620 related literature from 2021 to 2024.

2.2 Screening

The purpose of the screening process is to ensure whether the data found is in accordance with the criteria or not. To achieve this goal, researchers read abstracts of the literature and sift through the literature found. The screening results showed that 954 articles met the inclusion criteria.

2.3 Eligibility

Evaluation criteria questions are used to assess the quality of the data found. If the article discusses the reasons for the use of *Wordwall* on the mathematics learning outcomes of elementary school students, then the article will be assessed and can be used as the main data for this study.

2.4. Included

Based on the eligibility process, 10 articles were used as research data. Each article is synthesized to produce research results, and then analyzed and discussed in the results and discussion sections.

3. Results and Discussion

The researcher has conducted a *literature review*, that is, looking for articles related to the title of the article. After that, ten articles that discuss how the use of *Wordwall media* has an impact on students' mathematics learning outcomes at the elementary school level, were selected to be reviewed with categories that match the title and purpose of writing. Table 1 shows the strategies the research used to select articles:

Table 1 Identification of Article Selection

Discussion Categories	Search	Search Results
Search Year 2021-2024	<i>Google Scholar</i>	1620
Relevant titles		954
Results discussed		10

Source: Processed research, 2025

Interactive educational game media such as *Wordwall* It is one of the main focuses in research conducted by a number of researchers. The use of learning media is considered a more innovative approach and in accordance with the development of the times in the world of education (Wildan et al., 2023). Educational games offer new methods for teaching math using technology and innovative designs. The articles chosen to be discussed should be in accordance with the researcher's categorization, i.e. focusing on the research findings on how the media is used *Wordwall* Help students learn math. The ten articles selected for discussion were those that showed the difference in implementing the media *Wordwall*. The articles selected in this categorization are presented in detail in the following Table 2:

Table 2 The Utilization of Worldwall Media on Learning Outcomes

No.	Article	Researchers	Research Methods	Research Results
1.	The Effectiveness of <i>Wordwall</i> Applications to Improve Student Learning Outcomes in	(Lubis & Nuriadin, 2022)	Descriptive with a qualitative approach.	Based on the results of a trial conducted in grade V of SD Negeri Sawangan 07, researchers found that the use of <i>Wordwall learning media</i> that presents an attractive visual display and is equipped with interactive

No.	Article	Researchers	Research Methods	Research Results
	Elementary School Mathematics Learning			quizzes makes a significant contribution in supporting the delivery of space building materials by teachers, especially in distance learning situations. The <i>Wordwall</i> application is considered to be able to encourage an increase in students' learning motivation and have a positive influence on their learning outcomes on the topic.
2.	Application of <i>Wordwall</i> Media to Improve Student Learning Outcomes Mathematics Summing Concept Material in Grade 1 SDN Putat Jaya IV-380 Surabaya	(Oktaviasari et al., 2024)	Classroom Action Research (PTK).	Research conducted in grade 1 of SDN Putat Jaya IV-380 Surabaya showed that at the pre-cycle stage, the level of student learning completeness was still relatively low, which was 37.03%. After the implementation of the action in the first cycle, there was an increase in learning completeness to 70.37%. This increase continued in cycle II, where student learning completeness reached 88.88% with 24 students declared to have reached the minimum completeness criteria. Based on these data, it can be concluded that the use of <i>Wordwall interactive learning media</i> is able to make a significant contribution to improving students' mathematics learning outcomes, especially in understanding material about the Concept of Addition.
3.	Wordwall Media Implementation Gameshow To Improve Student Learning Outcomes in Grade 1 Mathematics Subjects In Freedom of Learning	(Lestari et al., 2023)	Classroom Action Research (PTK).	The research conducted in grade I of SDN Tanjungsari 2 Blitar City showed a significant increase in student learning completeness from the initial stage to cycle III. In the initial stage of implementation, the level of student learning completeness only reached 51.72% of which only 15 met the minimum completeness criteria. After improvements were made in the second cycle, the percentage of learning completeness increased to 69.48% which was marked by an increase in the number of students who completed to 20 students. The most optimal progress is seen in cycle III, where all students or 100% of the

No.	Article	Researchers	Research Methods	Research Results
				number of students achieve learning completeness according to the predetermined standards.
4.	The Effect of the Use of Wordwall-Based Interactive Learning Media on Students' Mathematics Learning Outcomes Class V SDN 2 Baadia	(Rosalia et al., 2024)	<i>Quasi Experiment with Only Post-test Control Group Design design type.</i>	Based on the results of research conducted on grade V students at SDN 2 Baadia, it can be concluded that the use of Wordwall-based interactive learning media has an influence on students' learning patterns, both in the experimental group and in the control group, especially in understanding mathematical material about data presentation.
5.	Application of <i>Wordwall Media</i> to Improve the Learning Outcomes of Students in Mathematics Subjects in Grade V Elementary School	(Asmiati et al., 2024)	Classroom Action Research (PTK).	This research was carried out in class V UPT SPF SD Superior Presidential Instruction BTN PEMDA Makassar City. In the pre-research stage, it is known that the level of completeness of students' mathematics learning outcomes is still very low, with an average of only 16.6. After the implementation of <i>Wordwall</i> interactive learning media in the first cycle, there was a significant increase to reach 46.7. Then, in the implementation of cycle II, the average completeness of student learning outcomes experienced a fairly high spike, namely 87.4. These results show that the use of <i>Wordwall</i> media makes a positive contribution to improving student learning outcomes in mathematics subjects.
6.	Improving Student Learning Outcomes Through <i>Wordwall</i> On Mixed Fractional Materials	(Rachmah et al., 2024)	Action Research Class (PTK).	Based on the results of research conducted in grade V of SDN Pesawahan, it is known that the use of <i>Wordwall interactive learning media</i> is able to increase student learning outcomes by up to 70%. <i>Wordwall</i> itself is a digital platform designed to support the learning process in a more interesting and fun way. Through features such as interactive quizzes, students are encouraged to participate more actively in learning activities.

No.	Article	Researchers	Research Methods	Research Results
				This contributes positively to increasing student involvement in the classroom, as well as deepening their understanding, especially in math materials related to solving mixed fraction problems.
7.	The Effect of Using <i>Wordwall</i> Applications on Results Learning Mathematics for Students in Building Spaces at SDN 12 Sapih River	(Nanda Putri et al., 2024)	Experimental method with <i>Quasi Experimental design</i>	Research conducted in grade V of SDN 12 Sungai Sapih showed an increase in students' mathematics learning outcomes after the implementation of <i>Wordwall</i> learning media. Based on the data obtained, the average score of students' pretest before the use of the media was 47.90. After the learning process using <i>Wordwall</i> , there was a significant increase in the average score of the posttest, which was 83.81. These findings indicate that the use of <i>Wordwall</i> learning media has a real positive impact on improving students' mathematical skills.
8.	The Effectiveness of <i>Wordwall Learning Media</i> to Improve Mathematics Learning Outcomes for Grade IV Students	(Arina et al., 2020)	Experimental method with <i>Quasi Experimental design</i>	Research conducted on grade IV students at UPTD SDN 175 Kawarasan, East Luwu Regency, showed that the mathematics learning outcomes of students in the experimental group were superior to those of the control group. This can be seen from the number of students in the experimental group who managed to achieve a higher category of learning outcomes than students in the control group. In addition, based on the results of the N-Gain analysis, the use of <i>Wordwall</i> interactive learning media has a significant positive impact on improving mathematics learning outcomes. Students who learn using <i>Wordwall</i> media show better development of learning outcomes than those who use image media as a learning aid.

No.	Article	Researchers	Research Methods	Research Results
9.	The Effectiveness of <i>Wordwall Learning Media</i> on Student Learning Outcomes In Mathematics Lessons in Elementary School	(Rahmadan ti et al., 2024)	Quantitative research with <i>True Experimental Design</i>	Based on the results of research conducted in grade IV of SDN Cigombong 02, it was found that the average learning outcomes of students in classes that use <i>Wordwall</i> media (experimental classes) are higher than those in classes that do not use such media (control classes). This can be seen from the average posttest score, where the control class got a score of 68.87, while the experimental class achieved a score of 76.95. The data shows a significant increase in students' mathematics learning outcomes after the implementation of <i>Wordwall learning media</i> . In addition, the majority of students in the experimental class were able to exceed the Minimum Completeness Criteria (KKM), which indicates that the use of this media is effective in helping students achieve the set competencies.
10.	The Effectiveness of Using <i>Wordwall Media</i> in Daily Practice of Mathematics Materials Plan and Scale for Student Learning Outcomes at SDN Menteng 03	(Indriyani & Alfarisa, 2022)	Quantitative research with a descriptive method.	Research conducted in grade V of SDN Menteng 03 shows that the use of <i>Wordwall</i> media has a significant impact on improving learning outcomes, especially in plan and scale materials. Based on the results of data analysis, it is known that the average pretest score of students before using the media is 66.56, while in the posttest after the application of <i>Wordwall</i> media, the average score increases to 88.75. This increase in score indicates a significant improvement in students' understanding of the material being taught. Thus, the results of this study underscore the importance of using digital media such as <i>Wordwall</i> in supporting more interactive and effective learning, which in turn can improve students' mathematics learning outcomes.

Based on the analysis of the ten selected articles, it can be concluded that the media *Wordwall* have a positive impact on mathematics learning, both at the lower and higher grade levels. This is due

to the ability of the media *Wordwall* in increasing student motivation and enthusiasm during the learning process. With the increase in students' enthusiasm for learning, the mathematics learning outcomes obtained have also experienced significant progress. Learning achievement, which is a component of learning outcomes, is very closely related to students' learning interests. The use of game design elements in this learning process is able to encourage improvement and trigger student creativity, so that it can create a more interactive and fun learning experience (Ardiana & Loekito, 2020). It is hoped that students who have high motivation can follow the entire series of stages of mathematics learning well, ranging from activities that require thinking at a basic level to thinking at a more complex and in-depth level

The table above shows the different ways in which the media *Wordwall* get affect students' mathematics learning outcomes at both the lower and upper grade levels, by utilizing a variety of different methods. In the context of mathematics learning, the relationship between media and communication processes plays an important role. They emphasized that the use of media in the learning process can have a significant impact on student learning outcomes (Sitorus & Manurung, 2024). This explanation shows that there is a clear difference between the learning outcomes of students who do not use media *Wordwall* with students who use these media in their learning activities. Based on a comparison of the values before and after the application of the media *Wordwall* In learning, there is an increase in student learning outcomes. These findings show that the use of *Wordwall* has the potential to have a positive impact on the mathematics learning achievement of elementary school students.

Wordwall is an online platform that offers a variety of educational game features. This platform can be used by teachers as an interactive medium to support the mathematics learning process, thereby helping students more easily understand the material presented. The platform allows users to select and create various game templates for free. Teachers also carry out the process of assessing student learning outcomes using these media. According to Magdalena, et al. (2021), *Wordwall* is one of the interactive learning media that is packaged in the form of educational games. This media can be accessed online easily, and provides a variety of templates and attractive visual displays, thus increasing student participation and the effectiveness of the learning process (Ariyanto et al., 2023). Apart from being a learning medium, *Wordwall* It also serves as a flexible evaluation tool, as it provides different types of questions such as quizzes, crossword puzzles, multiple choices, matching pictures or cards, and finding the right answers. Teachers at the elementary school level can take advantage of the various features available on this platform to assess mathematics learning outcomes in a more fun and creative way. Therefore, teachers' skills in integrating the media *Wordwall* In mathematics learning, it is very important, because it can help improve students' understanding of the material and make the learning process more interesting and meaningful.

Worwall media has many advantages, but there are some problems when using it. According to research conducted by Lubis and Nuriadin (2022), the other students help use the app on their respective phones due to the fact that not all students have a mobile phone. Many primary schools in remote areas have limited infrastructure and a lack of mastery of the technology needed by teachers to support the use of such media (Andriany & Warsiman, 2023). Use of interactive games based on *Wordwall* In mathematics learning, it is able to provide a more lively, fun, and interesting learning atmosphere. However, in its implementation, this strategy still needs to consider various challenges that may arise, such as technical constraints, pedagogical considerations, and limitations in terms of financing.

Based on the results of the literature review that has been conducted, it can be concluded that the use of *Wordwall*-based educational games has considerable opportunities in supporting the improvement of mathematics skills of elementary school students. However, in order for the use of

this media to provide optimal results, it is important to pay attention to interesting and appropriate game design aspects, teachers' competence in integrating technology into learning, and their suitability with the applicable curriculum. If used appropriately and in a targeted manner, *Wordwall* has the potential to be an effective learning medium in helping students understand mathematical concepts and improve their learning achievement.

3.1. Conclusion

Based on the results of a systematic literature review, it can be concluded that the use of *Wordwall* media in mathematics learning in elementary school has a significant positive impact on improving student learning outcomes. These findings show that the integration of interactive technologies such as *Wordwall* is an effective learning strategy, especially in the context of education in today's digital era. Therefore, teachers are expected to be more innovative and creative in choosing learning media that suits the needs of students. One alternative that can be used is *Wordwall* media, which is a web-based platform that provides various types of educational games that support teaching and learning activities. The use of *Wordwall* not only helps students understand mathematical concepts more easily, but also supports the achievement of learning objectives optimally. In addition, the interactive features offered are able to encourage students to think quickly and more carefully in solving the given questions. Thus, *Wordwall* contributes to increasing students' motivation to learn and indirectly impacts improving their learning outcomes in mathematics subjects.

Author Contributions

Suci Wulandari: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; Writing - review & editing. Candra Utama: Writing - review

Funding

No funding support was received.

Declaration of Conflicting Interests

Declarations of interest: none.

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