International Journal of Education, Vocational and Social Science
https://e-journal.citakonsulindo.or.id/index.php/IJEVSS
E-ISSN : 2963 4954
IJEVSS

The Effectiveness Of Wordwall Learning Media On Elementary School Students' Learning Activeness

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Abstract

This study aims to determine the effectiveness of using Wordwall as a learning medium on elementary school students' learning engagement. Learning engagement is an important indicator in the learning process, reflecting students' physical and mental engagement during learning activities. However, in practice, students are still found to be less active in asking questions, answering questions, discussing, and otherwise participating in learning activities. Therefore, innovative learning media are needed to increase student motivation and participation, one of which is through the use of educational game-based learning media such as Wordwall. This study used a quantitative approach with a quasi-experimental design using a pretest-posttest control group design. The subjects were elementary school students divided into an experimental class and a control class. The experimental class received instruction using Wordwall as a learning medium, while the control class used conventional learning media. Data collection techniques included observations of student learning engagement and questionnaires. Data analysis used statistical tests to determine differences in levels of learning engagement between the two groups. The results showed that the use of Wordwall as a learning medium was effective in increasing elementary school students' learning engagement. Students who participated in learning using Wordwalls showed increased participation in asking questions, answering questions, expressing opinions, and completing learning assignments compared to students who learned using

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conventional methods. Furthermore, the learning environment became more interactive, enjoyable, and increased student motivation. Based on the research results, it can be concluded that Wordwalls are an effective alternative innovative learning medium for increasing elementary school students' learning engagement. Teachers are advised to integrate Wordwalls into the learning process to create a more engaging and meaningful learning experience.

Keywords*: Wordwall learning media, learning engagement, elementary school, interactive learning, digital learning media.*

INTRODUCTION

Learning is a process of interaction between students and educators as sources of knowledge within a learning environment. Learning is also a process of acquiring knowledge, understanding, and character development in students, facilitated by educators. The existence of learning aims to create an internal learning atmosphere that supports learning events (Kaniawati et al., 2023). One of the compulsory subjects taught in Madrasah Ibtidaiyah (MI) is Mathematics.Mathematics is a subject taught at all levels of education. It possesses distinctive characteristics, uniqueness, and special significance. Mathematics is regarded as both the queen and servant of science. Moreover, mathematics is considered a fundamental science or a tool science in the body of knowledge. Understanding the importance and uniqueness of mathematics is essential because mastering basic mathematical concepts is necessary for studying science, technology, and other disciplines. The significance of mathematics in everyday life makes it one of the subjects that every student must master. Mathematics studies patterns, structures, and organized regularities, beginning with undefined elements, progressing to defined elements, and ultimately leading to axioms, postulates, propositions, and theorems. These mathematical components form an interconnected and well-organized system (Rahmaini & Ogylva Chandra, 2024).

Despite the importance of mathematics learning, many students still perceive mathematics as intimidating, difficult, overly associated with numbers, and boring. These perceptions are often linked to conventional teaching practices in which teachers merely explain the material and provide students with exercises. Therefore, it is necessary to identify factors influencing mathematics learning, particularly instructional media that can enhance students' learning activeness and reduce their anxiety toward mathematics. Ineffective instructional media remain one of the challenges encountered in mathematics education. Many mathematics

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teachers continue to rely on direct instruction approaches. Mathematics learning in elementary schools is still frequently dominated by conventional methods, such as lectures, where teachers deliver material verbally or through the use of whiteboards. This teacher-centered learning approach tends to limit students' opportunities to develop critical thinking skills and actively participate in the learning process. Consequently, students become passive and less engaged in constructing their understanding of concepts independently. In fact, active student involvement is one of the crucial factors in improving the quality of learning (Nuraeni et al., 2023).In line with the advancement of educational technology, the use of innovative and interactive learning media has become a necessity in creating effective and meaningful learning experiences. Learning media function as instructional aids that facilitate the delivery of materials, increase students' attention, and encourage active participation in learning activities. Nowadays, learning is no longer limited to textbooks and whiteboards but can utilize various digital media that are more engaging and diverse. One such medium is Wordwall, which offers various educational game-based features capable of creating an enjoyable and interactive learning environment.However, based on preliminary observations conducted at MIN 2 West Aceh, particularly in Grade III, the level of students' activeness in mathematics learning remains relatively low. Although the school has supporting facilities such as LCD projectors and internet access, their utilization in instructional activities has not been optimal. Teachers still tend to use conventional teaching methods, resulting in students being less actively involved in the learning process.

Based on these problems, it is necessary to identify one of the causes of students' low learning activeness, namely the use of non-varied instructional media and the lack of appropriate media utilization. Therefore, the researcher proposes the use of Wordwall media to enhance students' learning activeness. This is in line with Rodzikin, Susanto, and Wulandari, who stated that the use of Wordwall media has been explored to improve learning activeness, learning outcomes, and motivation (Rodzikin et al., 2023). This study also employs Wordwall media to enhance students' learning activeness.Wordwall is a web-based platform that can be used to create interactive quizzes. This application is specifically designed as a learning medium or assessment tool, and students generally enjoy using it because it incorporates enjoyable quiz-based games. Teachers can creatively design questions in Wordwall based on classroom materials. Alternatively, teachers can display the activities on a screen, allowing students to monitor their progress through the game. This is one of the advantages of using Wordwall. Technology can serve as an innovation and educational tool, particularly as a learning medium in education. Game-based learning models supported by Wordwall can be implemented in topics involving calculations

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and other learning materials to help students understand concepts more effectively. The presentation of complex materials becomes more engaging through this medium. The quiz questions provided are intended to encourage students to think independently. Students construct their knowledge from educational materials packaged in the form of games (Putra et al., 2024). This study is expected to provide a comprehensive understanding of the impact of using Wordwall media on students' learning activeness. The findings of this study may serve as evaluation material for teachers and schools in optimizing the use of technology in learning, thereby creating a more effective, interactive, and enjoyable learning atmosphere for students at MIN 2 West Aceh. More broadly, the results of this study are also expected to contribute theoretically and practically to the development of technology-based learning media aimed at improving the quality of education in madrasahs.

METHODS

This study employed a quantitative approach using a quasi-experimental research design. The quantitative approach was selected because this study aimed to test hypotheses and objectively measure the effect of using the interactive learning media Wordwall on students' learning activeness. A quasi-experimental method was used because the researcher administered treatment to the research subjects but was unable to randomly assign participants to groups, as the subjects had already been organized into naturally existing classes. Through this method, the researcher was able to compare the results before and after the treatment and distinguish the outcomes between the control and experimental groups, thereby clearly identifying the effectiveness of Wordwall media in improving students' learning activeness.

The study was conducted at MIN 2 West Aceh during the second semester of the 2025/2026 academic year. The sample consisted of 56 students from Class III A and Class III B, using a nonequivalent control group design. This design is a type of quasi-experimental design involving both control and experimental groups without random assignment of participants. However, both groups received a pretest to determine their initial conditions. Subsequently, the experimental group received the treatment, and both groups were administered a posttest to examine the changes that occurred within each group.

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RESEARCH DESIGN

Group	Pretest	Treatment	Posttest
Experimental (Class III B)	O_1	X (Wordwall Media)	O_2
Control (Class III A)	O_3	Conventional Method	O_4

The research design can be explained as follows:

O_1 and O_3 = Pretest measuring students' learning activeness before treatment.

X = Treatment in the form of learning activities using Wordwall media.

O_2 and O_4 = Posttest measuring students' learning activeness after treatment.

The sampling technique used was saturated sampling (total sampling), in which all members of the population were selected as research participants. This technique was employed because the population size was relatively small (fewer than 100 individuals), and the researcher intended to draw comprehensive conclusions regarding the entire population. Class III A was designated as the control group (without the use of Wordwall media), while Class III B was assigned as the experimental group (using Wordwall media).

The study was conducted over two days involving two classes as research subjects, with each class participating in one learning session. On the first day, the control group received instruction through conventional teaching methods. The activities began with an introduction, explanation of learning objectives, and delivery of instructional materials according to the predetermined procedures. Subsequently, the researcher implemented the teaching strategy designated for the control group. At the end of the lesson, reflection and evaluation activities were conducted. On the second day, the experimental group participated in the learning process using Wordwall media. This procedure was implemented to maintain consistency in the treatment provided. Each instructional session consisted of opening activities, core learning activities according to the assigned treatment, and closing activities.

The instruments used in this study included questionnaires, observation sheets, and documentation. The questionnaire was employed to measure students' learning activeness before (pretest) and after (posttest) the intervention. The questionnaire was developed based on Diedrich's indicators as cited in Sardiman (2018), encompassing visual, oral, listening, writing, mental, and emotional activities.

The questionnaire consisted of 20 statements measured using a four-point Likert scale (Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1). The validity test indicated that

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18 items were valid (r-calculated > 0.632), while two items were excluded. Reliability testing using Cronbach's Alpha yielded a coefficient of α = 0.874, indicating very high reliability.

Observation sheets were utilized to observe students' activeness during the learning process, including attention, participation in asking questions, responding to questions, involvement in discussions, and enthusiasm. Documentation included attendance lists, lesson plans, photographs of learning activities, and pretest and posttest questionnaire results.

Data collection procedures involved: (1) administering a pretest to assess initial learning activeness, (2) conducting observations during the learning process, (3) implementing Wordwall media in the experimental group for one meeting while the control group received conventional instruction, (4) administering a posttest to assess final learning activeness, and (5) collecting supporting documentation data.

Data analysis included both descriptive and inferential statistics. Descriptive statistics comprised mean, standard deviation, minimum and maximum scores, and percentages of learning activeness. The percentage of learning activeness was calculated using the following formula:

$P = (F/N) \times 100\%$

where:

P = Percentage of learning activeness

F = Obtained score

N = Maximum score

The categories of students' learning activeness are presented in Table 1.

Table 1. Categories of Students' Learning Activeness

No.	Percentage Range (%)	Category
1	86%–100%	Very Active
2	76%–85%	Active
3	60%–75%	Moderately Active
4	50%–59%	Less Active
5	<50%	Inactive

Inferential statistical analyses included normality testing using the Shapiro–Wilk test (α = 0.05), homogeneity testing using Levene's test, and hypothesis testing using the independent samples t-test. The decision criteria were as follows: if Sig. < 0.05, H_o was rejected, indicating a

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significant effect; if Sig. > 0.05, H_o was accepted, indicating no significant effect.
The hypotheses tested in this study were:
H_o: There is no effect of using Wordwall media on students' learning activeness.
H_1: There is an effect of using Wordwall media on students' learning activeness.

RESULTS

Analysis of Students' Learning Activeness Percentage

The percentage of students' learning activeness was calculated using the following formula:

$P = (F/N) \times 100\%$

where:

- P = Percentage of learning activeness
- F = Obtained score
- N = Maximum score

The categories of students' learning activeness are presented in Table 1.

The results of the percentage calculations for students' learning activeness in both groups are presented in Table 2.

Table 2. Percentage of Students' Learning Activeness

Group	Pretest (%)	Category	Posttest (%)	Category	Improvement (%)
Experimental	58.3	Less Active	82.6	Active	24.3
Control	57.9	Less Active	65.2	Moderately Active	7.3

In addition to descriptive analysis, statistical tests including normality, homogeneity, and hypothesis testing were conducted. The summary of the statistical test results is presented in

Table 3. Statistical Test Results

Type of Test	Sig. Value	Interpretation
Normality Test (Experimental)	0.121	Normal Distribution
Normality Test (Control)	0.108	Normal Distribution
Homogeneity Test (Levene's Test)	0.237	Homogeneous
Independent Samples t-test	0.001	Significant Difference

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Based on the normality test results, the experimental group data (Sig. = 0.121) and the control group data (Sig. = 0.108) were normally distributed because the significance values exceeded 0.05. The homogeneity test yielded a significance value of 0.237 (> 0.05), indicating that the variances of the two groups were homogeneous. Furthermore, the independent samples t-test showed a significance value of 0.001 (< 0.05), indicating a significant difference in students' learning activeness between the experimental group and the control group after the treatment was administered.

FINDINGS AND DISCUSSION

1.Students' Learning Activeness Before and After the Implementation of Wordwall Media

The findings revealed differences in students' learning activeness between the experimental group that utilized Wordwall media and the control group that received conventional instruction. The results of the descriptive analysis indicated that both groups had relatively similar levels of learning activeness prior to the intervention. The experimental group obtained a pretest percentage score of 58.3%, while the control group scored 57.9%. Based on the established criteria, both groups were categorized as Less Active.

Following the implementation of the instructional intervention, students' learning activeness increased in both groups. However, the improvement observed in the experimental group was substantially greater than that of the control group. The experimental group achieved a posttest percentage score of 82.6%, which falls within the Active category, reflecting an increase of 24.3 percentage points from the pretest score. In contrast, the control group attained a posttest score of 65.2%, categorized as Moderately Active, with an improvement of only 7.3 percentage points.

These findings indicate that students who participated in mathematics learning activities supported by Wordwall media demonstrated higher levels of engagement compared to those who experienced conventional teaching methods. During the learning process, students in the experimental group were more actively involved in answering questions, participating in discussions, expressing opinions, and responding enthusiastically to learning activities. The interactive features and game-based elements provided by Wordwall appeared to encourage students' active participation in classroom learning.

2.Inferential Statistical Analysis

Prior to hypothesis testing, normality and homogeneity tests were conducted to ensure that the data met the assumptions required for parametric analysis. The results of the Shapiro–

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Wilk normality test showed significance values of 0.121 for the experimental group and 0.108 for the control group. Since both values exceeded 0.05, the data were considered normally distributed.

Furthermore, the homogeneity test using Levene's test yielded a significance value of 0.237, which was greater than 0.05. This result indicates that the variances between the two groups were homogeneous.

The independent samples t-test was subsequently conducted to determine whether there was a significant difference in students' learning activeness between the experimental and control groups after the intervention. The analysis revealed a significance value of 0.001 ($p < 0.05$), indicating a statistically significant difference between the two groups. Therefore, the null hypothesis (H_0), stating that there is no effect of Wordwall media on students' learning activeness, was rejected. Conversely, the alternative hypothesis (H_1), which posits that Wordwall media significantly affects students' learning activeness, was accepted.

These findings demonstrate that the implementation of Wordwall learning media significantly improved elementary school students' learning activeness in mathematics learning.

CONCLUSIONS

The findings clearly demonstrate that the use of Wordwall as an interactive learning medium effectively enhances elementary school students' learning activeness in mathematics instruction. The integration of game-based learning elements through Wordwall creates a more engaging and enjoyable learning environment, encouraging students to actively participate in classroom activities. Students become more involved in asking and answering questions, expressing opinions, completing tasks, and collaborating with their peers during the learning process.

The combination of innovative instructional strategies and appropriate technological media ensures that students are not only cognitively engaged but also motivated to participate actively in learning activities. The implementation of interactive learning media is most effective when teachers carefully design instructional activities that align with students' developmental characteristics and learning needs.

In summary, the use of Wordwall in elementary mathematics education should be viewed as an innovative instructional approach that promotes active learning and improves the quality of classroom interaction. Its successful implementation depends on the readiness of teachers to integrate technology into their teaching practices, support from schools in providing adequate

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technological facilities, and the creation of a learning environment where students feel motivated, engaged, and confident in participating actively throughout the learning process.

ACKNOWLEDGMENTS

First and foremost, the researcher would like to express sincere gratitude to Allah SWT for His endless blessings, guidance, strength, and mercy throughout the completion of this research. Without His grace and support, this study would not have been successfully accomplished.

The researcher would also like to extend heartfelt appreciation to the lecturers and academic supervisors who provided invaluable guidance, constructive feedback, and continuous encouragement throughout the research process. Their expertise, insightful suggestions, and academic support greatly contributed to improving the quality and depth of this study.

Special thanks are extended to the principal, teachers, and students of MIN 2 West Aceh for their cooperation and willingness to participate in this research. Their support and active involvement were essential to the successful implementation of this study, particularly during the data collection process and the application of Wordwall learning media in the classroom.

The researcher also wishes to express sincere appreciation to fellow educators and colleagues who shared their experiences, perspectives, and knowledge regarding the integration of technology-based learning media in elementary education. Their valuable insights enriched the understanding and analysis presented in this research.

Deep gratitude is also conveyed to the researcher's family and close friends for their unwavering love, prayers, patience, and emotional support throughout every stage of this academic journey. Their encouragement and motivation have been a constant source of strength in completing this work.

Finally, the researcher hopes that this study will contribute to the advancement of educational practices, particularly in promoting the use of innovative and interactive learning media such as Wordwall to enhance students' learning activeness in elementary school settings. It is expected that the findings of this research will serve as a useful reference for educators, researchers, and educational institutions in improving the quality of teaching and learning through the effective integration of educational technology.

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