



The Effectiveness of *Wordwall* in Improving IPAS Learning Outcomes Third-Grade Students at MI Al Islam Mranggen

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ABSTRACT

This study aims to analyze the effectiveness of using the *Wordwall* interactive learning medium on the IPAS learning outcomes of third-grade students at MI Al Islam Mranggen. The study used a quantitative approach with a *quasi-experimental* design in the form of a posttest-only control group design. The study population consisted of 110 third-grade students at MI Al Islam Mranggen, while the sample comprised 60 students selected using purposive sampling—30 students in the experimental class and 30 in the control class. Learning outcome data were obtained through documentation of student scores and analyzed using descriptive and inferential statistics. Based on the results of the Shapiro–Wilk normality test, the data did not meet the assumption of normality; therefore, hypothesis testing was conducted using the Mann–Whitney test at a 5% significance level. The results showed that the average learning achievement of the experimental class was 83.45, higher than that of the control class at 77.27. The results of the Mann–Whitney test yielded an Asymp. Sig. (2-tailed) value of 0.001 ($p < 0.05$), indicating that the use of the *Wordwall* interactive learning medium is more effective than conventional learning in improving the IPAS learning outcomes of third-grade students at MI Al Islam Mranggen. Thus, the *Wordwall* interactive learning medium can serve as an effective alternative learning medium to improve IPAS learning outcomes in elementary schools.

Keywords

Interactive Learning Media, *Wordwall*, Learning Outcomes, IPAS, Elementary School.

Introduction

Natural and Social Sciences (IPAS) is a subject that plays a crucial role in developing students' critical thinking skills, curiosity, and ability to understand various natural and social phenomena in their surrounding environment. IPAS instruction in elementary schools is no longer focused on the theoretical presentation of concepts but emphasizes students' active engagement through contextual and meaningful learning experiences. According to Mat Nor & Halim (2023), teachers serve as facilitators who can integrate various teaching approaches and technologies so that abstract concepts are easier for students to understand.

Technological advancements have brought significant changes to the world of education, including the IPAS learning process in elementary schools. Mat Nor & Halim (2023) explain that the use of technology can help students understand abstract concepts through more concrete and contextual learning experiences. This finding is supported by Soriano-Sánchez (2025), whose meta-analysis results indicate that the application of information and communication technology (ICT) in science learning in elementary schools has a positive impact on learning motivation, student engagement, and improved learning outcomes. Nevertheless, the success of technology implementation in learning is also

influenced by teacher readiness. Sulaeman (2022) argues that teachers fundamentally understand the importance of technology-based learning but still require training to ensure its optimal implementation.

From an Islamic educational perspective, the importance of utilizing knowledge and learning resources is reflected in Quranic Surah Al-'Alaq, verses 1–5, which explain that Allah the Almighty teaches humanity through *the qalam* (pen) as a symbol of the means to acquire knowledge. This meaning suggests that the development of learning media, including digital technology, can be viewed as part of the effort to develop a more effective educational process. In line with this, Momani (2023) states that the use of digital media, interactive simulations, and online project-based learning can enhance students' motivation and active participation in learning IPAS concepts.

One technology-based learning innovation widely used in elementary schools is the interactive platform *Wordwall*. This platform offers various types of educational games, interactive quizzes, and exercises that can be tailored to students' characteristics, making the learning process more engaging and enjoyable. Research conducted by Oktania Handoyo Jathy (2024) shows that the use of *Wordwall* can increase student engagement and activity in IPAS learning through the presentation of interactive material. These findings are supported by research by Fazira (2025), who found that the use of *Wordwall* significantly contributes to improving students' cognitive abilities in IPAS compared to conventional learning. Additionally, Momani (2023) explains that *Wordwall* is an effective tool for fostering participatory and meaningful learning in line with the demands of 21st-century education.

Although various studies demonstrate *Wordwall's* effectiveness in improving the quality of learning, the results of a pre-survey in the third-grade class at MI Al Islam Mranggen revealed a different situation. Instruction is still dominated by the use of conventional media such as textbooks, blackboards, and worksheets, making learning activities tend to be monotonous. This situation has led to suboptimal student participation and learning outcomes that remain below expectations. This phenomenon aligns with Momani's (2023) findings, which reveal that the low utilization of interactive digital media can affect students' motivation, engagement, and learning outcomes.

Based on these conditions, there appears to be a gap between the findings of previous research which demonstrated the effectiveness of *Wordwall*—and the current teaching practices at MI Al Islam Mranggen. Most previous studies have focused on the implementation of *Wordwall* in various elementary schools, whereas studies on the effectiveness of this medium on IPAS learning outcomes among third-grade students at MI Al Islam Mranggen have not been extensively conducted. Therefore, this study is important to analyze the effect of using the interactive *Wordwall* medium on the IPAS learning outcomes of third-grade students at MI Al Islam Mranggen.

This study is expected to provide empirical evidence regarding the effectiveness of the *Wordwall* interactive media as a technology-based learning alternative capable of improving students' learning outcomes. In addition to contributing to the development of IPAS learning in elementary schools, the results of this study are also expected to serve as a reference for teachers in selecting learning media that are more innovative, interactive, and suited to the characteristics of their students.

Literature Review

Wordwall Interactive Media

Learning media serve as a medium for conveying educational messages from educators to students, making the material easier to understand and ensuring that learning objectives are effectively achieved. According to Sumiharsono (2018), the term “media” derives from the word “medium,” meaning an intermediary, while Yaumi (2021) explains that media refers to all forms and channels used to convey educational messages. Over time, instructional media have evolved to serve not only as conveyors of information but also as learning strategies capable of fostering active student engagement. In line with this, Marheni (2022) categorizes instructional media into print, audio, visual, audiovisual, and computer-based or interactive digital media. According to Firdha & Zulyusri (2022), interactive media can integrate text, images, animations, sound, video, and quizzes, thereby creating a more engaging and meaningful learning experience.

One technology-based interactive learning medium widely used in education is *Wordwall*. Utami (2022) explains that *Wordwall* is a technology-based learning medium that helps teachers present material in a more engaging way. This view is supported by Zailillah & Alfurqan (2022), who state that *Wordwall* is designed by combining elements of games and educational quizzes, thereby encouraging students to actively participate both individually and in groups. Additionally, Olisna (2022) explains that *Wordwall* is a web-based platform that offers various interactive learning activities, while Minarta & Pamungkas (2022) emphasize that this application is easy to use for both teachers and students, thereby supporting practical and efficient learning.

Wordwall offers a variety of interactive learning templates, such as quizzes, match-ups, matching pairs, random wheels, group sorts, word searches, maze chases, and various other activities that can be tailored to the characteristics of the learning material. According to Mujahidin (2021), the diversity of these features provides teachers with flexibility in designing learning experiences that are more engaging, interactive, and learner-centered. The use of *Wordwall* is further supported by its attractive interface, ease of access across various digital devices, and its ability to enhance students’ active participation during the learning process.

Despite its many advantages, *Wordwall* also has several limitations. Mujahidin (2021) explains that display customization options are still limited, creating activities takes relatively longer, and the audio feature does not yet support automatic question reading. These findings align with Herta (2023), who states that *Wordwall* has the advantages of an attractive interface, the ability to boost learning motivation, and its potential as a learning assessment tool; however, it still has limitations regarding visual aspects and development time. Nevertheless, considering the characteristics of the material, the students, and the teachers’ readiness, *Wordwall* remains a promising interactive learning tool for supporting improvements in the quality of instruction and student learning outcomes.

Learning Outcomes

Learning outcomes are one of the indicators of student success following the learning process. According to Syachtiyani and Trisnawati (2021), learning outcomes reflect students’ achievements during the learning process, which can be measured through learning outcome indicators as well as their level of satisfaction with the material studied. In line with this, Hamalik Oemar, as cited in Lailla (2023), explains that learning outcomes are behavioral changes that occur in students, whether in terms of knowledge, attitudes, or skills. These changes are demonstrated not only through improved grades but also through the ability to understand concepts, solve problems, make decisions, and apply knowledge in daily life, as explained by Wirda (2020).

This view is reinforced by Lutfil Hakim (2024), who states that learning outcomes are demonstrated through positive behavioral changes as indicators of the achievement of learning competencies, while Rohmah (2020) emphasizes that learning outcomes constitute relatively permanent changes in the cognitive, affective, and psychomotor domains. Thus, learning outcomes can be understood as changes in students' abilities that encompass knowledge, attitudes, and skills as indicators of the success of the learning process.

The measurement of learning outcomes is conducted across three main domains: the cognitive, affective, and psychomotor domains. Amelia (2024) explains that the cognitive domain relates to thinking skills and mastery of knowledge, including the ability to recall, understand, apply, analyze, synthesize, and evaluate information. The affective domain relates to the development of students' attitudes, values, interests, and responses to the learning process, while the psychomotor domain relates to the ability to perform skills or actions resulting from learning experiences. This view aligns with Eltresno (2022), who states that these three domains form an integrated whole that complement one another in describing students' overall learning outcomes.

Learning outcomes are influenced by various factors originating from both within and outside the student. According to Berliana (2022), internal factors include aptitude or intelligence, interest and motivation to learn, and the learning strategies employed by students. External factors, meanwhile, encompass the family environment, school environment, social environment, and physical environment, all of which can either support or hinder the learning process. This view is reinforced by Rosyid (2020), who explains that students' physical and psychological conditions as internal factors as well as the family, school, and community environments as external factors play a crucial role in determining learning success. Therefore, learning outcomes are influenced not only by individual abilities but also by a supportive learning environment, ensuring that learning objectives can be optimally achieved.

Methods

This study employed a quantitative approach using a *quasi-experimental design*, specifically a *Posttest-Only Control Group Design*, to determine the differences in learning outcomes between students who learned using the *Wordwall* interactive media and those who used conventional instruction in the third-grade IPAS course. The study was conducted at MI Al Islam Mranggen, Polokarto Subdistrict, Sukoharjo Regency, during the even semester of the 2025/2026 academic year, specifically from January to March 2026. The study population consisted of all third-grade students, totaling 110 students, divided into four classes. The research sample was selected using purposive sampling, with Class IIIA serving as the experimental class and Class IIIB as the control class, each consisting of 30 students, for a total sample size of 60 students.

Data collection was conducted using the documentation technique. Learning outcome data were obtained from the combined scores of students' daily quizzes and exercises throughout the learning process. Data from the experimental class were collected after the implementation of *the Wordwall* interactive media, while data from the control class were collected through conventional instruction during the same period. Data analysis was conducted using descriptive and inferential statistics. Descriptive analysis was used to describe student learning outcomes through mean scores, minimum scores, maximum scores, and standard deviation. Before hypothesis testing, the data were tested using the *Shapiro-Wilk* normality test and the *Levene homogeneity* test. Next, differences in learning outcomes between the experimental and control classes were analyzed using an independent samples

t-test at a significance level of 0.05. If the data did not meet the assumption of normality, the *Mann-Whitney* nonparametric test was used as an alternative

Results

Description of Student Learning Outcome Data

Table 1. Results of Descriptive Statistical Analysis of Student Learning Outcomes

Group	N	Min	Max	Mean	Standard Deviation
<i>Experiment</i>	30	71	94	83.45	7.426
<i>Control</i>	30	67	84	77.27	5.049

Based on the results of the descriptive statistical analysis, the experimental class achieved an average learning outcome score of 83.45, with a minimum score of 71, a maximum score of 94, and a standard deviation of 7.426. Meanwhile, the control class had an average of 77.00, with a minimum score of 67, a maximum score of 84, and a standard deviation of 5.67. Descriptively, the students' learning outcomes in the experimental class were higher than those in the control class.

Prerequisite Tests

Normality Test

Table 2. Results of the Normality Test

Tests of Normality		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Group	Statistic	df	Sig.	Statistic	df	Sig.
Mean Value	Experiment (Class 3A)	.130	30	.200*	.921	30	.029
	Control (Class 3B)	.099	30	.200*	.947	30	.143

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Meanwhile, the control group obtained a significance value of 0.143 (Sig. > 0.05), indicating that the data are normally distributed. Therefore, the assumption of normality is not met, so the analysis does not proceed with a homogeneity test or a parametric test (*Independent Samples t-test*); instead, the nonparametric *Mann-Whitney* test is used to test the research hypotheses.

Hypothesis Testing

Hypothesis testing was conducted using the nonparametric *Mann-Whitney* test because the data did not meet the assumption of normality. This test was used to determine the effectiveness of using the *Wordwall* interactive media on IPAS learning outcomes by comparing the learning outcomes of the experimental class and the control class.

Table 3. Results of the Mean Rank Calculation for the Mann-Whitney Test

Ranks	Group	N	Mean Rank	Sum of Ranks
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Average Score	Experiment (Class 3A)	30	37.87	1136.00
	Control (Class 3B)	30	23.13	694.00
	Total	60		

Based on Table 3, the experimental class achieved a *mean rank* of 37.87, while the control class achieved a *mean rank* of 23.13. The higher *mean rank* in the experimental class indicates that the learning outcomes of students using the *Wordwall* interactive medium tended to be better than those of students who participated in conventional learning. However, to determine whether this difference is statistically significant, a Mann–Whitney test, as presented in Table 4, must be conducted.

Table 4. Results of the Mann–Whitney Test

Test Statistics ^a	Mean
Mann–Whitney U	229.000
Wilcoxon W	694.000
Z	-3.270
Asymp. Sig. (2-tailed)	.001

a. Grouping Variable: Group

Based on Table 4, the Asymp. Sig. (2-tailed) value is 0.001, which is less than the significance level of 0.05 ($p < 0.05$). These results indicate that there is a significant difference between the learning outcomes of students in the experimental class and the control class. The higher *mean rank* in the experimental class indicates that the use of the *Wordwall* interactive media is more effective than conventional learning in improving the IPAS learning outcomes of third-grade students at MI Al Islam Mranggen for the 2025/2026 academic year.

Discussion

The research results show that the use of the interactive *Wordwall* medium is more effective than conventional learning in improving the IPAS learning outcomes of third-grade students at MI Al Islam Mranggen. This is evident from the average learning outcome score in the experimental class of 83.45, which is higher than that of the control class at 77.00. Furthermore, the categorization results indicate that the majority of students in both classes fell into the “moderate” category; however, the learning outcomes of the experimental class were significantly better () than those of the control class. These findings suggest that the use of the interactive *Wordwall* platform is capable of supporting students’ learning outcomes more effectively.

This difference in learning outcomes was supported by the results of the Mann–Whitney test, which showed an Asymp. Sig. (2-tailed) value of 0.001 ($p < 0.05$), indicating a significant difference between the experimental and control classes. Furthermore, the mean rank of the experimental class (37.87) was higher than that of the control class (23.13). These results indicate that the use of the interactive *Wordwall* platform is more effective than conventional instruction in improving students’ IPAS learning outcomes.

Wordwall’s effectiveness stems from its nature as an interactive learning medium capable of actively engaging students throughout the learning process. Through various activities such as quizzes and educational games, students are encouraged to participate directly, making learning more engaging and less monotonous. These conditions help students focus more on understanding the material and boost their motivation and engagement during the learning process. This finding aligns with Firdha &

Zulyusri (2022), who state that interactive media can increase student participation through direct involvement in learning activities. Additionally, Isnaeni (2020) explains that learning media plays a role in enhancing learning motivation while creating a more effective learning process.

Conversely, learning outcomes in the control class, which received conventional instruction, tended to be lower than those in the experimental class. This indicates that learning without interactive media provides students with more limited opportunities to interact with the learning material. This aligns with Yaumi's (2021) view that learning media serve to facilitate the delivery of material, increase student interest, and encourage active engagement in the learning process.

The results of this study also support the research by Agusti & Aslam (2022), Savira & Gunawan (2022), Mahareka & Mujazi (2024), and Utami (2022), which showed that the use of *Wordwall* can improve learning outcomes compared to instruction without interactive media. The consistency of these findings reinforces the notion that *Wordwall* is an effective learning medium for use in elementary school instruction.

The findings of this study are also consistent with the theory of learning outcomes proposed by Hamalik (in Lailla, 2023), which states that learning outcomes are changes in knowledge, attitudes, and skills following the learning process. Through the use of the interactive *Wordwall* medium, students gain a more active learning experience, allowing these changes to occur more optimally. Thus, the interactive *Wordwall* medium has proven effective in improving the IPAS learning outcomes of third-grade students at MI Al Islam Mranggen for the 2025/2026 academic year.

Conclusion

Based on the research results, it can be concluded that the use of the interactive *Wordwall* platform in IPAS instruction for third-grade students at MI Al Islam Mranggen is more effective than conventional instruction. This is indicated by the average learning achievement score of the experimental class, which was 83.45—higher than that of the control class at 77.27. The results of the Mann-Whitney test showed an Asymp. Sig. (2-tailed) value of 0.001 ($p < 0.05$), indicating a significant difference in student learning outcomes between the two groups. These findings indicate that the interactive media *Wordwall* can improve students' IPAS learning outcomes through more interactive and engaging instruction. Thus, the interactive media *Wordwall* can serve as an effective alternative learning tool to enhance IPAS learning outcomes in elementary schools.

Limitations and Future Studies

This study has several limitations that should be considered when interpreting the results. The study employed a quantitative approach using learning achievement tests as the data collection method; consequently, the data obtained only reflect students' achievement levels and do not provide an in-depth explanation of the learning process, motivation, or student responses during the use of *the Wordwall* interactive media. Additionally, the study was conducted over a relatively short period and involved only one school with a limited sample size, so the results cannot yet be broadly generalized to a larger population. Differences in student characteristics, school conditions, and the availability of learning facilities at other schools also have the potential to yield different findings. The results of this study are also not entirely free from the influence of other factors outside the treatment, such as learning motivation, prior knowledge, and the students' learning environment, which could not be fully controlled during the research process.



For future researchers, it is recommended to conduct further research by examining other variables that may influence student learning outcomes, expanding the sample size to include several different schools, or using mixed methods to provide a more comprehensive picture of the effectiveness of the *Wordwall* interactive media in learning.

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