WORDWALL EDUCATIONAL GAMES AND INCREASING STUDENTS' INTRINSIC MOTIVATION IN LEARNING NATURAL SCIENCES IN ELEMENTARY SCHOOL

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ABSTRACT

The objective of this study is to investigate (1) the characterization of Wordwall educational game media usage in the science curriculum for class IV at UPT SPF SD Inpres Kassi, (2) the portrayal of Wordwall educational game media application in the same subject and class, and (3) the impact of Wordwall educational games on students' learning motivation in the science subject for class IV at UPT SPF SD Inpres Kassi, located in Manggala District, Makassar City. This research utilizes a quantitative approach, specifically employing experimental research and a Quasi Experimental Design format known as Nonequivalent Control Group Design. The study's population comprises the students from class IV at UPT SPF SD Inpres Kassi, with a sample of 24 students drawn from classes IV A and IV B through the Purposive Sampling technique. The technique employed for data collection involved both questionnaires and observations. For data analysis, descriptive statistical analysis and inferential statistical analysis were utilized, which included normality tests, homogeneity tests, and hypothesis tests through independent sample T-tests. (1) The utilization of Wordwall educational game media was effectively executed, as indicated by the percentage increase from each meeting, which demonstrated a positive impact supported by observation results; each session progressed from the good category to the very good category. (2) Results from the post-nontest in the experimental group reflected a rise in learning motivation, categorizing it as very high, whereas the control group was classified as high. Although there was an increase, it was not as pronounced as that observed in the experimental class. The Independent Sample T-test's inferential statistical analysis yielded a Sig. (2-tailed) value of 0.001, which is less than 0.05, leading to the rejection of the H0 hypothesis and the acceptance of Ha. (3) This indicates that the implementation of Wordwall educational game media significantly impacts the learning motivation of fourth-grade students in the science subject at SD Inpres Kassi, Manggala District, Makassar City. Therefore, it can be concluded that the use of Wordwall educational game media positively affects the learning motivation of grade IV students at UPT SPF SD Inpres Kassi, Manggala District, Makassar City.

Keywords: wordwall educational game, learning motivation, science

ABSTRAK

Tujuan dari penelitian ini adalah untuk menyelidiki (1) karakterisasi penggunaan media permainan edukatif Wordwall dalam kurikulum IPA untuk kelas IV di UPT SPF SD Inpres Kassi, (2) Gambaran penerapan media permainan edukatif Wordwall pada mata pelajaran dan kelas yang sama, serta (3) Dampak permainan edukatif Wordwall terhadap motivasi belajar siswa dalam mata pelajaran IPA kelas IV di UPT SPF SD Inpres Kassi, yang berlokasi di Kecamatan Manggala, Kota Makassar. Penelitian ini menggunakan pendekatan kuantitatif dengan metode penelitian eksperimen dan desain eksperimen semu (Quasi Experimental Design) yang dikenal sebagai Nonequivalent Control Group Design. Populasi dalam penelitian ini adalah siswa kelas IV di UPT SPF SD Inpres Kassi, dengan sampel sebanyak 24 siswa dari kelas IV A dan IV B yang dipilih melalui teknik Purposive Sampling. Teknik pengumpulan data yang diterapkan meliputi kuesioner dan observasi. Dalam proses analisis data, digunakanlah analisis statistik deskriptif serta analisis statistik inferensial, termasuk di dalamnya uji normalitas, uji homogenitas, dan uji hipotesis dengan menggunakan Ttest untuk sampel independen. (1) Pemanfaatan media permainan edukatif Wordwall dilaksanakan secara efektif, sebagaimana ditunjukkan oleh peningkatan persentase dari setiap pertemuan, yang menunjukkan dampak positif yang didukung oleh hasil observasi; setiap sesi mengalami peningkatan dari kategori baik menjadi sangat baik. (2) Hasil dari post-nontest pada kelompok eksperimen menunjukkan peningkatan motivasi belajar yang dikategorikan sangat tinggi, sedangkan kelompok kontrol dikategorikan tinggi. Meskipun terjadi peningkatan, peningkatan tersebut tidak sebesar yang terjadi pada kelas eksperimen. Analisis statistik inferensial menggunakan uji T sampel independen menghasilkan nilai Sig. (2-tailed) sebesar 0,001, yang lebih kecil dari 0,05, sehingga hipotesis H_0 ditolak dan H_a diterima. (3) Hal ini menunjukkan bahwa penerapan media permainan edukatif Wordwall memiliki dampak yang signifikan terhadap motivasi belajar siswa kelas IV dalam mata pelajaran IPA di SD Inpres Kassi, Kecamatan Manggala, Kota Makassar. Oleh karena itu, dapat disimpulkan bahwa penggunaan media permainan edukatif Wordwall berpengaruh positif terhadap motivasi belajar siswa kelas IV di UPT SPF SD Inpres Kassi, Kecamatan Manggala, Kota Makassar.

Kata Kunci **:** *game edukasi wordwall, motivasi belajar, IPA.*

A. Introduction

Students' learning motivation in learning is very important, because motivation can encourage students' enthusiasm to learn. But on the other hand, if there is no motivation, then students will not be enthusiastic about learning (Puthree et al., 2021). Learning motivation can affect student learning outcomes. A student who lacks motivation will not get maximum results. In line with Cahyani et al., (2020) learning motivation is the overall driving force in students that gives rise to the intention to learn, so as to achieve the desired learning goals.

The problem faced by students in the learning process is the low skill of teachers in using learning media. The teacher still explains the material monotonously during the learning process, so that students look less enthusiastic and tend to be passive because of the monotonous and boring learning process. This causes students' motivation to learn to be low.

Based on these problems, the researcher made observations in class IV UPT SPF SD Inpres Kassi, Manggala District, Makassar City and found the same problem, namely the lack of motivation to learn in students. This is due to the same factor, namely the teacher explaining the material in a monotonous manner and giving questions and answers in explaining the material using reading book-based media. Learning only relies on a number of learning media such as LKS, package books, and modules. After the teacher delivered the learning material, the teacher gave the exercises in the student package book.

Meanwhile, from the perspective of students, it can be seen that students only do exercises without knowing the purpose, so students look bored and unmotivated. Therefore, learning in the classroom is often inefficient, the teaching materials presented by teachers and media are less varied. Students tend to feel bored and bored, which affects their motivation to learn. In line with this, Syafitri et al., (2022) explained that students who are bored with learning will become lethargic, lazy, and have decreased motivation to learn. This problem also occurred in the research of Hidayati et al., (2022) fourth grade students of SDN 1 Peresak, and the research of Saefullah et al., (2023) students of SDN 03 Sukadana. Teachers tend to use package books, LKS, modules and do not take advantage of existing technology.

Technological innovation can create various learning media that can increase students' attention and make it easier for them to understand the material. The use of facilities such as laptops, LCD and projector screens can be a supporting force for teachers in creating innovations in learning. In line with this, Sahabuddin et al., (2022) explained that learning media can support teachers in delivering learning materials interactively, time-efficiently, and increase student learning motivation.

Learning media as an intermediary for the delivery of learning materials at various levels of education has various types that can be used according to certain learning materials effectively (Kharissidqi & Firmansyah, 2022). The learning media used can be in the form of educational *games*. *Educational games* are a learning medium that helps students not to feel bored, provides a learning experience in a new style, and improves students' concentration and memory (Rochmada, 2022). One of the educational games used to increase student learning motivation is *Wordwall. Wordwall* is one of the web-based applications that can be used as a learning resource, learning media and assessment tool (Sari & Yarza, 2021). *Wordwall* presents interesting games and utilizes technology to make learning more enjoyable by creating a more dynamic learning atmosphere, triggering student participation, and optimizing the understanding of material concepts.

The results of previous research conducted by Gandasari & Pramudiani (2021) in a study entitled "The Influence of *Wordwall* Applications on Students' Science Learning Motivation in Elementary

Schools" showed that *the Wordwall* application had an effect on students' learning motivation. The study by Nisa & Susanto, (2022), titled "The Impact of WordwallBased Educational Games on Motivation in Mathematics Learning," found that using educational games based on Wordwall positively affects students' motivation in math. Similarly, the research by Nissa & Renoningtyas, (2021), named "Utilizing Wordwall Learning Media to Enhance Student Interest and Motivation in Learning," indicated that Wordwall is an easytouse interactive media that boosts students' interest and motivation in their studies.

Analyzing various journals reviewed by the researchers reveals that incorporating Wordwall educational games significantly improves students' motivation for learning. Consequently, the researchers aim to conduct a followup study at SD Inpres Kassi, located in Manggala District, Makassar City, titled "The Impact of Wordwall Educational Games on the Learning Motivation of UPT SPF Elementary School Inpres Kassi, Manggala District, Makassar City. ".

B. Research Methods

The approach used in this study uses a quantitative approach, which focuses on data analysis in the form of questionnaires processed with statistical techniques. The research conducted is experimental in nature. The design applied for this research is a Quasi Experimental Design, specifically a Nonequivalent Control Group Design. In the design of this study, two groups were involved, namely the experimental group and the control group.

The preparation stage in this research is carried out as an initial step, such as preparing a research proposal supervised by two supervisors, compiling and validating research instruments, and applying for a research permit (Sahabuddin et al., 2023). The sample used was class IV UPT SPF SD Inpers Kassi, Manggala District, Makassar City for the 2023/2024 school year consisting of classes IV A and IV B with a total of 48 students. The methods for gathering data include observations, questionnaires, and documentation. The research tools incorporated consist of questionnaires measuring student learning motivation, teaching modules, and sheets for observing the learning implementation process.

Then before the data is analyzed, the learning motivation questionnaire data is obtained by providing learning motivation questionnaires to the experimental class and the control class at the beginning and end of the meeting. This learning motivation questionnaire uses the Likert model assessment scale which consists of a scale of 1-4. The scales used, described in the table as follows:

Table 1 Alternative Answers for Research Instruments

Answer Instrument Item	Score
Strongly Agree	4
Agree	3
Disagree	2
Strongly disagree	1

Source: Mardapi (2020)

The data obtained by each student is in the form of scores, then converted into grades. The grouping of students' learning motivation levels in understanding based on the reference score is determined in table 2.

Table 2 Criteria for Student Learning Motivation

Score	Category
25 – 43	Low
44 – 62	Keep
63 – 81	Tall
82 – 100	Very High

Source: Mardapi (2020)

The techniques for analyzing data utilized include both descriptive and inferential statistical analysis. The information assessed descriptively consists of observations during the learning process in the experimental groups, as well as the results from the prenontest and postnontest. The purpose of inferential statistical analysis is to evaluate the research hypothesis (Sahabuddin et al., 2022). The requirements for analysis involve multiple tests, including normality and homogeneity tests. The normality test was conducted based on the prenontest and postnontest scores, using the ShapiroWilk test with IBM SPSS Version 30 at a 5% significance level or 0,05. A normal distribution is indicated if the significance value is greater than or equal to 0,05; if it is below this figure, the data is not considered normally distributed. Following this, the homogeneity test assessed whether the two sample datasets are homogeneous or not. This assessment helps to determine any variance differences between the experimental group and the control group. In this research, the researcher utilized IBM SPSS Statistic Version 30 to perform Levene's test. The decision rule states that if the significance value exceeds 0,05, the data is deemed homogeneous; however, if it is less than 0,05, it is labeled as nonhomogeneous. Once the normality and homogeneity tests were completed, a hypothesis test was performed to determine the impact of the Wordwall educational game media on students' learning motivation. This test was derived from questionnaires observing the learning motivation among both the experimental and control groups. The hypothesis testing utilized the IBM SPSS Statistic Version 30 application, employing an independent tTest analysis technique.

C. Research Results and Discussion

1. Result

The implementation of the science learning process in the experimental group with energy source materials and forms and their changes was carried out in 2 meetings, namely meeting 1 with the provision of *prenontest* and continued with the provision of treatment in the form of the use *of Wordwall* educational *games*, the 2nd meeting providing treatment in the form of the use *of Wordwall* educational *games* with the provision *of postnontest*. *The prenontest* was conducted to measure students' learning motivation in science subjects before being given treatment, while *the postnontest* was carried out to measure students' learning motivation in science subjects after being given treatment. The data from the observation of the implementation of science learning in the experimental group are as follows:

Table 3. Observation of Learning Implementation

Treatment	Earned Score / Maximum Score	Percentage
Meeting 1	11/15	73,33%
Meeting 2	14/15	93,33%

According to table 3, during the first meeting, the learning process

achieved a score of 73,33%, which falls into the good category. In the second meeting, the achievement percentage rose to 93,33%, classified as very good. This achievement percentage is calculated by taking the score received, dividing it by the highest possible score, and then multiplying by 100%. From the percentages noted in meetings 1 and 2, we can see that the use of the Wordwall educational game improved from a good implementation to a very good one. The descriptive statistics for the prenontest scores from both the experimental group and the control group using the Wordwall educational game are provided in table 2 below:

Rephrase**Table 4. *Prenontest* Learning Motivation**

Descriptive Statistics	Experimental Group	Control Group
	Statistical Value	Statistical Value
Number of samples	24	24
Lowest Rate	39	43
Highest Scores	85	83
Rata-rata (*Mean*)	58,25	58,13
Range	46	40
Standard Deviation	11,230	9,484
Mode	53	54
Median	56,00	56,00

Based on table 4, the mean value of the experimental group was 58,25 with a standard deviation of 11,230 and the highest value of 85 and the lowest value of 39. The control group had a mean of 58,13 with a standard deviation of 9,484, the highest score of 83 and the lowest score of 43. Both groups show a small standard deviation, so *the mean* can represent the whole data. The retang value in the experimental group was 46 and in the control group was 52.

The prenontest of student learning motivation is then grouped into 4 categories with frequency scores and percentages as follows:

Table 5. Distribution of Frequency and Percentage of *Prenontest Results of* Learning Motivation

Shoes	Category	Experimental Group		Control Group	
		Frequency	Presented	Frequency	Presented
25 – 43	Low	1	4,2 %	1	4,2 %
44 – 62	Keep	18	75%	17	70,8 %
63 – 81	Tall	4	16,7 %	5	20,8 %
82 – 100	Very High	1	4,2 %	1	4,2 %
Sum		24	100 %	24	100 %

Based on table 5, it is known that in the experimental group, students who obtained a low category score of 1 person with a percentage of 4,2%, the medium category as many as 18 people with a percentage of 75% and the high category as many as 4 people with a percentage of 16,7%. From the findings of the descriptive analysis done, it is clear that the experimental group's prenontest results fall into the medium range. This is evident from the overall average (mean) value of learning motivation, which is 58,25. Meanwhile, in the control group, it was known that 1 student obtained a low category score with a percentage of 4,2%, 17

people in the medium category with a percentage of 70,8% and 5 students in the high category with a percentage of 20,8%. The data of *the postnontest* results of the experimental group and the control group can be seen in the following table:

Table 6. *Postnontest* Motivasi Belajar

Descriptive Statistics	Experimental Group	Control Group
	Statistical Value	Statistical Value
Number of samples	24	24
Lowest Rate	79	65
Highest Scores	99	85
Rata-rata (*Mean*)	91,00	75,54
Range	20	20
Standard Deviation	5,217	5,626
Mode	96	71
Median	92,00	76,00

Based on table 6, the mean value of the experimental group was 91.00 with a standard deviation of 5,217 and the highest value of 99 and the lowest value of 79. The control group had a mean of 75.54 with a standard deviation of 5,626, the highest score of 85 and the lowest score of 65. Both groups show a small standard deviation, so *the mean* can represent the whole data. The retang value in the experimental group and the control group was 20. *The postnontest* of student learning motivation is further grouped into four categories with the following frequencies and percentages:

Table 7. Distribution of Frequency and Percentage of *Postnontest Results* of Learning Motivation

Shoes	Category	Experimental Group		Control Group	
		Frequency	Presented	Frequency	Presented
25 – 43	Low	0	0%	0	0%
44 – 62	Keep	0	0%	0	0%
63 – 81	Tall	2	8,3 %	19	79,2 %
82 – 100	Very High	22	91,7 %	5	20.8 %
Sum		24	100 %	24	100 %

According to table 7, the data shows that in the experimental group, there were 2 students with high category scores, making up 8. 3% of the group, while 22 students achieved scores in the very high category, accounting for 92,7%. The descriptive analysis results indicate that the postnontest scores lie within the very high category, as evidenced by an average learning motivation score of 91,00. In contrast, the control group had 19 students scoring in the high category, which is 79,2%, and 5 students in the very high category, representing 20,8%.

To address the formulated research hypothesis, inferential statistical analysis was conducted. Before testing the hypothesis, assumption tests were performed, including a normality test and a homogeneity test. Findings from the normality test for both the prenontest and postnontest data for both groups, analyzed with IBM SPSS Statistics Version 25, showed a significance

value higher than α = 0,05. This suggests that both groups have a normal distribution of data. Additionally, the homogeneity test results for the prenontest and postnontest data demonstrated that the significance value based on the mean was also above α = 0,05, confirming that the data variation between the two groups is similar. To evaluate the hypothesis surrounding the prenontest outcomes for the experimental and control groups, the IBM SPSS Statistics Version 25 program was employed. The following details present the results from the Independent Sample t Test concerning the prenontest scores of both groups.

Tabel 8. ***Independent Sampel t Test Prenontest***

Data	t	df	Sig. (2-tailed)	Information
Prenontest experimental group and *Prenontest* group	0,042	48	0,483	0.483> 0.05 = no difference

Based on table 8, there was no significant difference in the mean prenontest between the experimental group and the control group. This is supported by a tcal value that is smaller than the ttable and a Sig. (2-tailed) value that is greater than α = 0.05. The results of the Independent Sample t Test postnontest values of the experimental group and the control group prenontest are as follows:

Tabel 9. ***Independent Sampel t Test Postnontest***

Data	t	df	Sig. (2-tailed)	Information
Postnontest group experiment and *Postnontest* group	9,870	48	< 0,001	0.001 < 0.05 = there is a difference

Based on table 9, there was a significant difference in student learning motivation between the group that used *Wordwall* educational *games* and the group that used picture media in science learning. The tcount value greater than the ttable value, together with the Sig. value (2 tailed) of 0,001 < 0,05, confirms the rejection of H0 and the acceptance of Ha. Thus, it can be concluded that the use of *Wordwall* educational *games* has an effect on students' motivation to learn in science subjects.

2. Discussion

The implementation of the learning process using *the Wordwall* educational *game* shows a positive influence on increasing student learning motivation in science subjects in the experimental class (Sahabuddin & Makkasau, 2024) It is proven through observations made by teachers during learning that there is an increase in the first meeting with a percentage of 73,68% meaning good, then experiencing an increase in the second meeting with a percentage of 94,73% meaning very good. This is in line with the opinion of Mujahidin et al., (2021) that *Wordwall* is one of the alternative media to support and improve the learning process through various templates that can be used by teachers in creating an interesting, fun and meaningful learning process.

Based on descriptive analysis, it was shown that the prenontest of the experimental group and the control group were in the low category. However, differences arose after the

treatment, where the experimental group that used *the Wordwall* educational *game* showed a more significant improvement compared to the control group that used image media. This is evidenced by the average postnontest of the experimental group increased to 91,00 which was in the very high category while the control group with an average of 75,54 was in the high category. Although it has increased, it is not as significant as the experimental class. Students in the experimental group who used the *Wordwall* educational *game* were more enthusiastic and actively engaged during learning. This is in line with the opinion that educational *games* are a learning medium that helps students not to feel bored, provides a learning experience in a new style, and improves students' concentration and memory (Rochmada, 2022) The use of educational games can make students increase students' interest and motivation in learning through an interest and learning approach through games (Najuah et al., 2022) In line with that, Gandasari & Pramudiani (2021) stated that *Wordwall* presents interactive quiz games with interesting and varied designs so that they can motivate students.

The use of *Wordwall* educational *games* in science learning has an effect on students' learning motivation. The results of The initial test indicated that the distribution of data was normal and homogenous. The Independent Sample t Test revealed a notable difference in average scores between the experimental group that utilized Wordwall and the control group that used image media, with a significance value of less than 0,001. As a result, the null hypothesis was rejected while the alternative hypothesis was accepted. The impact of incorporating Wordwall educational games in science lessons for fourth graders is closely linked to the benefits offered by the Wordwall game itself. This aligns with findings from research by Gandasari & Pramudiani, (2021), which confirmed that the Wordwall application enhances student motivation for learning. In addition, Nissa & Renoningtyas, (2021), in their work titled "The Use of Wordwall Learning Media to Increase Student Interest and Motivation in Learning," indicated that Wordwall serves as an interactive media that is userfriendly and effectively boosts student interest and motivation in their studies.

D. Result

1. Conclusion

Based on the results of the research conducted, it can be concluded that the use of *Wordwall* educational *games* in the science learning process in grade IV UPT SPF SD Inpres Kassi, Manggala District, Makassar City was carried out very well, as shown by the increase in observation results from the first meeting to the second meeting. The learning motivation of students in the experimental group showed a more significant increase compared to the control group, as evidenced by the change in the average score of the learning motivation questionnaire from the medium category to very high, while the control group remained in the medium category to high, although it increased but not as significant as the experimental group. The use of *Wordwall* educational *games* has an effect on students' learning motivation in science subjects, which is shown through the results of a hypothesis test with a Sig. (2-tailed) value of 0,001 < 0,05, so that H_0 is rejected and H_a is accepted.

2. Suggestion

For teachers, it is recommended to use *Wordwall* educational *games* as an auxiliary medium in the learning process, with creativity in using its features to create interesting learning activities and increase student participation and interest in the subject matter. For students, they are expected to follow the teacher's instructions attentively and actively collaborate with classmates in answering questions or completing activities presented through *Wordwall* educational *games*. For other researchers, the results of this study can be used as a reference for further research, by exploring and further developing other *Wordwall* features.

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