

The Effect of Using Open the Box Type Wordwall Educational Game on Students' IPAS Cognitive Learning Outcomes

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Abstract: The purpose of this study was to determine whether there is an effect of using the open the box type wordwall educational game on the cognitive learning outcomes of IPAS students at SDN Palumbonsari 1, East Karawang District. This study used a quantitative method of pre-experiment type with a one group pretest posttest design. The population in this study were all fourth grade students of SDN Palumbonsari 1, totaling 135 people. The sampling technique used purposive sampling technique, so the sample in this study was class IV A with a total of 46 people. Data collection techniques using multiple choice tests as many as 30 items before and after treatment. Then carried out feasibility testing with validity test obtained 20 valid items, reliability test obtained $r_{11} 0.73$, differentiator test and difficulty level. Data analysis techniques using descriptive statistical analysis and inferential statistics. Then the statistical hypothesis test was carried out with the paired sample t-test test obtained a Sig (2-tailed) value of $0.001 < 0.05$, meaning that H_0 was rejected and H_1 was accepted. So it can be concluded that there is an effect of using the open the box type wordwall educational game on the cognitive learning outcomes of IPAS students at SDN Palumbonsari 1.

Keywords: Cognitive learning outcomes; IPAS; Open the box; Wordwall game

Introduction

Education is key to a country's development. With education, young people in a country can gain knowledge and skills, shape character, strengthen values and teach life skills needed to face future challenges (Reimers, 2020; Tyas et al., 2020). However, as the world develops rapidly and dynamically, education must also keep up with these developments so that it will be relevant and effective in preparing students to face a complex world (Biesta, 2021). The development of the world in this era of globalization with the role of information technology has brought new developments to the world of education (Budiman, 2017).

Curriculum renewal is one of the keys to reflecting the latest developments in science and technology (Syahbana et al., 2024). The curriculum is the most

important thing in education. Without a curriculum in education, learning will not be carried out and learning objectives will not be realized (Hamalik 2015). Then, students will not get the appropriate learning targets if the curriculum used is not appropriate (Campbell-Phillips, 2020). Changes and improvements to the curriculum in Indonesia have started since 1947, 1964, 1968, 1973, 1975, 1984, 1994, 2004, namely the Competency-Based Curriculum (KBK), the 2006 curriculum called the Education Unit Level Curriculum (KTSP), the 2013 Curriculum (Kurtilas), in 2008 there was a revision to Kurtilas Revision, and currently the curriculum developed is the *Merdeka* Curriculum (Amdani et al., 2023).

Merdeka curriculum requires educators to be literate in information technology (Gurion, 2024; Mawaddah, 2023). But in fact, there are still many teachers who do

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not understand how to use this technology. Then the lack of facilities and infrastructure owned by the school. So that teachers prefer to convey material only using textbooks that have been provided at school, as an evaluation tool asking students to fill in the questions contained in the book, and rarely using learning media. This should not be done by a teacher, because a teacher is someone who determines the success of education, learning in schools, and student learning outcomes. Learning outcomes in the cognitive aspect include all subjects in elementary school (SD). One of them is natural and social science subjects (IPAS) (Suryansah & Suwarjo, 2016). In the *Merdeka* curriculum, science and social studies subjects are unified because elementary school children tend to see things as a whole and integrated.

IPAS learning is actually not only focused on the end result, but also focuses on the process of learning activities carried out in the classroom (Indriyani et al., 2023; Lince, 2022). In addition, IPAS learning also has some materials that must require interesting visualizations for students. However, there are still many teachers who have not used the principles of learning optimally, so that classroom activities are still dominated by the teacher. This is what makes some students not interested in IPAS learning which looks bored, does not involve students in learning so that they become passive and have no enthusiasm for learning. So that at this time IPAS learning has not yet obtained optimal learning outcomes or is lower than it should be. Learning outcomes are an achievement that has been achieved by students academically through exams, doing assignments, activeness in conducting questions and answers that support the acquisition of these learning outcomes (Dakhi, 2020).

The results of observations made by researchers in class IV SDN Palumbonsari I, that there are low student learning outcomes, especially in IPAS subjects. This happens because teachers rarely use innovative learning media and lack of adequate infrastructure at school. In addition, the learning methods used by teachers in the teaching and learning process more often use the lecture method. So that it causes boredom, and not actively involved students in the learning process.

As reinforcement for this research, the researchers took references from several previous studies such as Kartika (2023) who used wordwall with a gamification approach in improving IPAS cognitive learning outcomes. In her research there was an increase after the implementation of three cycles with an average percentage of 89%. So that the use of wordwall can improve the cognitive learning outcomes of students in elementary school. In line with this, research conducted Fidya et al. (2021), who applied wordwall interactive game media to IPAS learning outcomes showed that

there was an increase in student learning outcomes in the third cycle with a completeness value of 80.64%. This research makes innovation for teachers in creating learning media that is interesting and in accordance with student needs.

Based on these problems, the use of learning media chosen is the wordwall educational game type open the box on the cognitive learning outcomes of IPAS students in elementary school. So that wordwall applications can be utilized as an approach or learning media in the teaching and learning process. The purpose of using this educational game is to determine the extent of the influence of its use on the cognitive learning outcomes of IPAS grade IV students. So that researchers are interested in the title "The Effect of Using Open the Box Type Wordwall Educational Games on Cognitive Learning Outcomes of IPAS Students in Elementary Schools".

Method

The research method used in this study is a quantitative method with the type of Pre-experiment.. According to Sugiyono (2014) Pre-experiment is a design that uses only one group or one class that is given a pre and post test. The research design used is one group pretest-posttest design, which is research conducted in one group without a control and comparison group. The following is a research pattern with a one group pretest-posttest design.

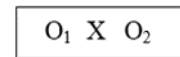


Figure 1. One grup pretest posttest design

The population in this study were all fourth grade students of SDN Palumbonsari 1, totaling 135 people. The sampling technique used purposive sampling technique. According to Sugiyono (2016) purposive sampling technique is a sampling technique based on certain considerations. Thus, the sample used in this study was class IV A students totaling 46 people. The data collection technique used in this study is a test. Tests before and after treatment. Then the feasibility test of multiple choice question instruments is carried out by testing validity, reliability, differentiating power and difficulty level.

The validity test is used to determine whether the instrument made is valid or not. To measure the validity test, the point biserial correlation formula is used with the help of Microsoft Excel. Decision making on the validity test, namely if r_{pb} > r_{table} on a two-way test with a significance level of 5% or 0.05, then the item is considered valid. Conversely, if r_{pb} < r_{table} then the item is considered invalid. After testing the validity with

Microsoft Excel that of the 30 items tested, it is known that there are 20 valid items and 10 invalid items. So that 20 items of instrument questions that are declared valid are suitable for use in data collection in this study. The following is the formula for the validity test which is calculated using microsoft excel.

The instrument reliability test is used with regard to the level of persistence or accuracy of the measurement results (Nita, 2024). An instrument has an adequate level of reliability, if the instrument is used to measure the measured aspects several times the results are the same or relatively the same. To test the reliability test using the KR-20 formula with the help of Microsoft Excel. After the reliability test was carried out, the result was r_{11} 0.73, this value was included in the high reliability category. So that the instrument that has been made is reliable. The following is the formula for the reliability test calculated using microsoft excel.

The normality test is used to determine whether the data obtained is normally distributed or not. In this study, the normality test was carried out using the One Sample Kolmogorov-Smirnov Test with the help of SPSS version 29.0.2.0 for windows (Kusumaningrum et al., 2024). Decision-making provisions for the normality test, namely data is said to be normally distributed if the significance value > 0.05. Conversely, if the data <0.05 then the data is not normally distributed.

The homogeneity test was conducted to determine whether there was an increase in students' IPAS cognitive learning outcomes before and after being given the open the box type wordwall educational game treatment (Nailani & Rezeki, 2024). In this study, the calculation of the homogeneity test was carried out with the help of the SPSS program version 29.0.2.0 for windows. The purpose of the homogeneity test is to conclude whether the data used comes from a

population that has the same variance or not. The criteria for homogeneity testing, namely if the Sig value < 0.05, then the data from the population has unequal or inhomogeneous variance, and if the Sig value \geq 0.05, then the data from the population has the same variance or homogeneous.

Statistical hypothesis testing in this study was conducted to determine whether or not there were differences in cognitive learning outcomes in IPAS subjects using open the box type wordwall educational games. Hypothesis testing was carried out using paired sample t-test with the SPSS version 29.0.2.0 program for windows. The hypotheses in this study are as follows:

$$H_0 : \mu_1 = \mu_2$$

$$H_1 : \mu_1 \neq \mu_2$$

Result and Discussion

This research activity was carried out at SDN Palumbonsari 1, East Karawang District in the 2023/2024 academic year. In this study, the class used as the object of research is class IV A with a sample size of 46 students / I, to improve cognitive learning outcomes in IPAS subjects by using wordwall educational game media type open the box. The cognitive aspects achieved in this study are students' abilities in knowledge (C1), understanding (C2), application (C3) and analysis (C4) with the help of educational game media wordwall type open the box.

The results of students' cognitive learning scores obtained from the initial test before the use of open the box type wordwall educational game media with 46 students / respondents, can be seen in table 1 descriptive statistics using SPSS version 29.0.2 for windows, which is as follows.

Table 1. Descriptive Statistical Data of Pretest Value of IPAS Cognitive Learning Outcomes

Parameters	N	Range	Minimum	Maximum	Mean	Std. Deviation
Pretest	46	50	20	70	45.00	11.353
Valid N (listwise)						46

Based on Table 1 descriptive statistical data of pretest scores of IPAS cognitive learning outcomes of students with a total of 46 obtained a minimum value of 20, a maximum value of 70, an average value of 45, with a standard deviation of 11.353 and a variance value of 128.889. The following is a histogram image of the statistical data of the pretest scores of students' IPAS cognitive learning outcomes.

The posttest was conducted to determine the cognitive learning outcomes of students obtained from the final test after the use of open the box type wordwall educational game media with a total of 46 respondents. Thus, this was done to compare students' initial abilities and abilities after being given treatment. These results can be seen in the descriptive statistics table using SPSS version 29.0.2 for windows, which is as follows.

Table 2. Descriptive Statistical Data of Posttest Value of IPAS Cognitive Learning Outcomes

Parameters	N	Range	Minimum	Maximum	Mean	Std. Deviation
Pretest	46	50	50	100	77.72	11.818
Valid N (listwise)						46

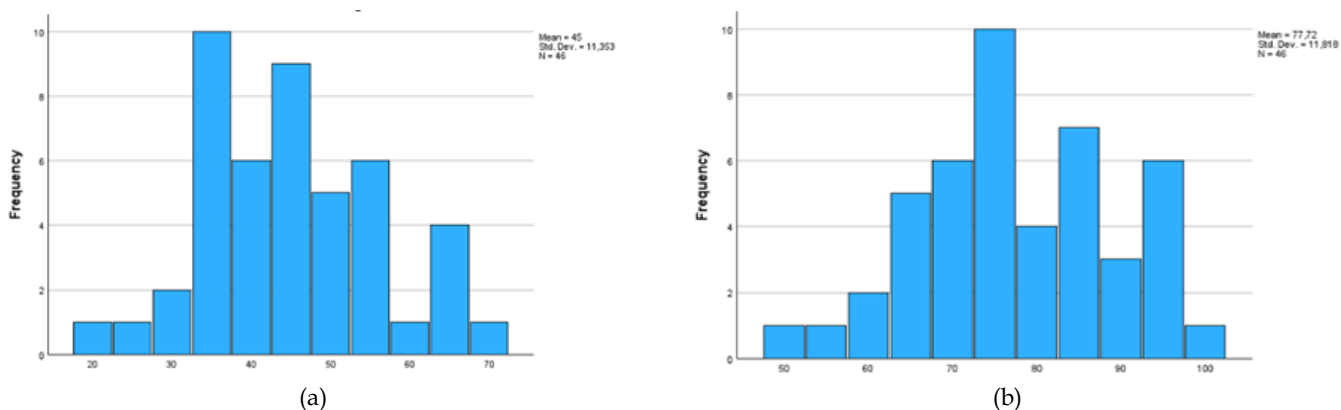


Figure 2. Histogram of IPAS cognitive learning outcomes; (a) Pretest and (b) Posttest

Based on Table 2 descriptive statistical data of posttest scores of IPAS cognitive learning outcomes of students with a total of 46 obtained a minimum value of 50, a maximum value of 100, an average value of 50, with a standard deviation of 11.818 and a variance value of 139.674. The following is a histogram image of the statistical data of the posttest scores of students' IPAS cognitive learning outcomes.

The data analysis requirements test was conducted to measure the effect of the use of open the box type wordwall educational games on the cognitive learning outcomes of IPAS fourth grade students of SDN Palumbonsari 1. The requirements test in this study used normality test and homogeneity test. Processing of normality test data and homogeneity test was carried out with the SPSS version 29.0.2.0 program for windows.

Table 3. Pretest and Posttest Normality Test Results

Parameters	Shapiro-Wilk		
	Statistic	df	Sig.
Pretest of IPAS Cognitive Learning Outcomes	0.963	46	0.155
Posttest of IPAS Cognitive Learning Outcomes	0.968	46	0.227

The normality test is carried out to determine whether the distribution of data obtained from the pretest and posttest results is normally distributed or not. Data processing in the normality test uses the SPSS version 29.0.2.0 program with the One Sample Kolmogorov-Smirnov and Saphiro-Wilk tests. A condition is said to be normally distributed if the significance value obtained is greater than the $\alpha = 5\%$ level (significance > 0.05). The results of the normality test of pretest and posttest data on cognitive learning outcomes of the two research samples can be presented in the table as follows.

Based on the results of the normality test above, it shows that the pretest results obtained a Shapiro-Wilk Sig value of 0.155, then the significance value of $0.155 > 0.05$ so that the pretest results show that the data is normally distributed. The posttest results obtained a Shapiro-Wilk Sig value of 0.227, then the significance value of $0.227 > 0.05$ so that the posttest results show that the data is normally distributed. It can be concluded that the pretest and posttest results are normally distributed or meet the normality test requirements.

The homogeneity test is used to determine whether the values generated from the pretest and posttest of students have homogeneous variants or not. Homogeneity testing uses the Levene test with the SPSS

version 29.0.2.0 program for windows. A data is said to be homogeneous if the Sig value > 0.05. Conversely, if the sig value < 0.05 then the data distribution is not homogeneous. The following are the results of the pretest and posttest homogeneity test using the Levene test.

Based on the Table 4 of pretest and posttest homogeneity test results above, it can be seen that the significance value on Based on Mean is 0.581. Then this shows that the pretest and posttest data have homogeneous variants. This is because the probability of $0.581 > 0.05$.

Table 4. Pretest and Posttest Homogeneity Test Results

Parameter	Levene Statistic	df1	df2	Sig.
Cognitive Learning Outcomes IPAS	0.306	1	90	0.581

Hypothesis testing is done to determine whether or not there are differences in the cognitive learning outcomes of IPAS students using open the box type wordwall educational games. Hypothesis testing was carried out using a paired sample t-test with the SPSS version 29.0.2.0 program for windows. Decision making in hypothesis testing, namely if the Sig (2-tailed) value < 0.05, then H0 is rejected and H1 is accepted, which

means there is a significant difference, and if the Sig (2-tailed) value ≥ 0.05 , then H_0 is accepted and H_1 is rejected, which means there is no significant difference.

The following are the results of hypothesis testing using paired sample t-test, namely:

Table 5. Pretest and Posttest Hypothesis Testing Results

Parameters				95% Confidence Interval of Difference		t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. error mean	Lower	Upper			
Pretest Cognitive Learning Outcomes	-32.717	9.586	1.413	-35.564	-29.871	-23.148	45	<0.001
Posttest Cognitive Learning Outcomes								

Based on the results of statistical hypothesis testing with paired sample t-test, it shows that the Sig value. (2-tailed) of the pretest and posttest data is $0.001 < 0.05$, then H_0 is rejected and H_1 is accepted. So it can be concluded that there is a significant effect of using wordwall educational games type open the box on the cognitive learning outcomes of IPAS fourth grade students of SDN Palumbonsari 1.

Learning by using educational game media wordwall type open the box can make students become more active (Amanda et al., 2024; Hasanah & Sutiah, 2023) and have high curiosity. In addition, wordwall educational game media type open the box can help students in working on problems because they can see concretely the learning media that is related to the teaching material (Andini, 2022; Sari et al., 2023). Students are also involved in learning by using educational game media wordwall type open the box (Yusni & Hurriyah, 2024). So that students can know the cultural wealth in Indonesia such as regional specialties, musical instruments, regional dances, traditional clothing, traditional houses, and others.

Conclusion

This research was conducted at SDN Palumbonsari 1 with class IV A students as the research sample totaling 46 students / I, who will be given treatment using educational game learning media wordwall type open the box on the cognitive learning outcomes of IPAS students in elementary school. This study used instruments in the form of multiple choice questions consisting of 20 items. The initial test (pretest) was given to students before treatment and the final test (posttest) was given to students after treatment. The hypothesis test shows that the Sig. (2-tailed) is 0.001 from pretest and posttest data. Because the significance value is $0.001 < 0.05$, H_0 is rejected and H_1 is accepted. So it can be concluded that there is an effect of using educational games wordwall type open the box on cognitive learning outcomes IPAS ssiwa class IV SDN Palumbonsari 1.

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Author Contributions

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Conflict of interest

The authors declare no conflict of interest.

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