JoTaLP: Journal of Teaching and Learning Physics 10, 2 (2025): 146-153
Website: http://journal.uinsgd.ac.id/index.php/jtlp/index
ISSN 2580-3107 **(online) ISSN** 2528-5505 **(print)**

[Research Article]

COMPARISON OF THE PAKEM LEARNING MODEL BASED ON WORDWALL GAMES WITH THE DIRECT INSTRUCTION LEARNING MODEL ON THE LEARNING OUTCOMES

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DOI: http://dx.doi.org/10.15575/jotalp.v10i2.48322
Received: 7 July 2025 ; Accepted: 25 August 2025 ; Published: 31 August 2025

ABSTRACT

This type of research is quasi-experimental, with the research design of The Matching Only Posttest Only Control Group Design. This study aims to determine the differences between the learning outcomes of students taught using the PAKEM learning model assisted by wordwall games and the Direct Instruction learning model of class VIII SMPN 2 Bontomarannu. The population used was all class VIII students at SMPN 2 Bontomarannu in the 2023/2024 academic year, consisting of 5 classes with a total of 138 students. By using the matching sample technique, two classes were obtained, namely class VIII C and VIII B with a total of 20 pairs of samples. The data analysis technique used in the study was descriptive and inferential statistical data analysis. The results of the descriptive analysis showed that the average learning outcomes of the experimental class were 71.75 where 60% of students achieved the minimum completeness score. while the learning outcomes in the control class were 36.75 with a percentage reaching a minimum completion value of 0%. Using the Mann-Whitney Test, the asymp. Sig. (2-tailed) <0.05 value was obtained, indicating that the hypothesis was accepted so that there was a significant difference in learning outcomes between students taught using the PAKEM learning model assisted by wordwall games and the Direct Instruction learning model.

Keywords: PAKEM, Direct Instruction, wordwall, learning outcomes, quasi experiment.

How to cite: Jusriana, A., Mohd Iskandar, N. N., & Al Afifah, J. A. (2025). Comparison of the PAKEM learning model based on Wordwall games with the direct instruction learning model on the learning outcomes, *Journal of Teaching and Learning Physics 10* (2), 146-153. DOI: http://dx.doi.org/10.15575/jotalp.v10i2.48322

1. INTRODUCTION

Fundamentally, the essence of education is a process of maturation that aims to develop mindsets and explore individual potential. Therefore, choosing the right learning method or model is very important to apply in the learning process in order to achieve optimal results. (Dani & Hilwa, 2020).

The appropriate learning model is one of the determinants of success in a learning activity process carried out by educators or educators. Therefore, choosing an inappropriate learning model can have a major impact on student learning outcomes. Therefore, educators or educators should choose a good learning model. Educators also play an important role in creating creative and effective teaching media to support the learning process, technological developments can be utilized by educators or educators to create teaching media. (Friani et al., 2017)

Media is a tool or means used in the learning process to convey messages in the form of information that can encourage students to actively learn. There are several teaching media that can attract students' motivation to learn, one of which is the use of technology-based learning media. (Yusuf Hidayat & Andira Ayu, 2019).

By having media and teaching materials combined with learning methods that involve students being able to participate actively in class, it is hoped that they will be able to improve learning outcomes. Apart from that, it can provide direct experience for students to be able to innovate, encourage students to easily understand and simplify abstract contexts to become even simpler. In line with the natu
re of physics learning which emphasizes the importance of direct learning experiences, this learning aims to provide meaningful experience adequate to students. This is emphasized through the active role of students in the process of discovery and construction of their own knowledge. (Ikbal et al., 2018)

The phenomenon found at this time, in the learning process, students are very interested in learning that involves computer and mobile media, especially after the pandemic, students cannot be separated from virtual media. In addition, in the era of learning that involves technology, educators are required to master the use of media that has developed so that they can achieve a good learning process. Therefore, the use of the right learning model and learning media is a solution that can be done to improve student learning outcomes.

The PAKEM Learning Model is a learning approach that involves more student activities in accessing various information and knowledge which will then be discussed together in class. Thus, students will gain experience that can improve their understanding and competence. (Kaban et al., 2021)

The selection of the PAKEM learning model can be supported by the selection of teaching media that adapts to the times, one of the teaching media that can be used is the wordwall teaching media. Wordwall itself is a web-based application that can be used as a learning medium such as creating interactive quizzes, anagrams, random words, grouping and others. There are many features that can be selected so that it provides many variations in delivering material by educators.

Based on the results of research conducted by (Andini, 2022) Syarif Hidayatullah State Islamic University with the research title "The Effect of Using Wordwall Learning Media on Student Learning Outcomes in the Periodic System of Elements Material" which aims to determine the effect of Wordwall learning media on student learning outcomes in the periodic system of elements material. The research method used is the quasi-experimental method with Nonequivalent control group design. The results of this study state that based on the results of the hypothesis test on the posttest results of the experimental class and the control class, it can be concluded that the use of Wordwall learning media has an effect on student learning outcomes

in the periodic system of elements material. This is because Wordwall learning media is able to send information through its capacity to make learning more effective, interesting, efficient and enjoyable so that students can solve problems in learning and can improve their learning outcomes.

Similar things were also found in the research conducted by (Rohaniawati, 2016) entitled "Implementation of the Pakem Approach to Improve Students' Thinking Skills in the Personality Development Course of Educators". The research method used is the PTD method (Classroom Action Research). Data collection techniques used are non-test and test techniques. The results of the study showed that student activity in the learning process was stated to be very good, this is evident from the results of student activity in cycle 1 of 91%, in cycle 2 reaching 100% and also in cycle 3 reaching 100%. For the results of the analysis of student thinking skills in the Personality Development course of Educators using the PAKEM approach, it can be concluded that it almost increased at each meeting.

2. METHOD

The type of research that will be carried out in this research is quantitative with the research method that will be used is the experimental method. The type of research used in this research is quasi-experimental research because this research has a control class that can be used as a comparison for the class that was treated. The choice of this method was based on the fact that researchers wanted to know the learning outcomes from using the model PAKEM learning based on wordwall game media on the learning outcomes of students in the sample group to be studied. The design of this research is The Matching Only Posttest Only Control Group Design.

The population in this study were all students in class VIII of SMP Negeri 2 Bontomarannu. Sampling using this technique is by looking at the average of all classes in the population. The classes that have the same population average are classes VIII B and VIII C. The data analysis technique used is:

1. Descriptive Statistical Analysis

The data obtained from this research is in the form of quantitative data which is then analyzed using descriptive analysis techniques. The purpose of descriptive statistical analysis is to determine the arithmetic mean, variance and standard deviation of each variable studied. This data can be processed using the IBM SPSS program. V.26 or you can also use the following formula:

a. *Mean* (Mx)

$$\bar{X}=\frac{\sum Xifi}{\sum fi} \quad (1)$$

Information:
$\sum Xifi$ = ith value
$\bar{X}$ = mean
f = frequency

b. Variance (S2)

$$S^2 = \left[\frac{\sum fi(X_i-\bar{X})^2}{n-1}\right] \quad (2)$$

Information:
S^2 = variance
X_i = measurement data
f = frequency
n = number of data

c. Standard Deviation (SD)

$$SD = \sqrt{\frac{\sum fi(x_i-\bar{X})^2}{n-1}} \quad (3)$$

Information:
SD = standar deviation
x_i = measurement data
$\bar{X}$ = arithmetic average
fi = frequency
n = number of data

2. Inferential Statistical Analysis

a. Normality test

$$D_{count} = maksimun\ |F_o(X) - S\ (X)| (4)$$

b. Homogenety Test

$$F\ Count = \frac{{S_B}^2}{{S_K}^2} \quad (5)$$

c. Hypothesis Testing

$$U_1 = n_1 n_2 + \frac{n_1(n_1-1)}{2} - R_1 \quad (6)$$

$$U_2 = n_1 n_2 + \frac{n_2(n_2-1)}{2} - R_2 \quad (7)$$

d. Statistical Hypothesis

H0 : μ1 = μ2

H1 : μ1 ≠ μ2

3. RESULT AND DISCUSSION

This research was carried out in class VIII C as an experimental class and class VIII B as a control class at SMPN 2 Bontomarannu, carried out in the even semester of the 2023/2024 academic year. The results of this research are answers to the previously determined problem formulations, which consist of three problem formulations. The first and second problem formulations will be answered using descriptive statistical analysis, while the third problem formulation will be answered through inferential statistical analysis, as well as to test the hypothesis that has been formulated. The following are the research results obtained after the research was carried out.

3.1 Result

3.1.1 Description of the Learning Results of Students Taught Using the PAKEM Learning Model Assisted by the Wordwall Game for class VIII C SMPN 2 Bontomarannu.

3.1.1.1 Descriptive Analysis Results

Table 1. Descriptive Statistical Data on Physics Learning Results for Class VIII C SMPN 2 Bontomarannu which was taught using the PAKEM Learning Model assisted by the Wordwall Game

Parameter	Nilai
Mean	71.75
Standard Deviation	12.489
Variance	155.987
Minimum	50
Maximum	95

In the table, the average or mean value is obtained which is the overall score obtained by students on the tests that have been given which is divided by the number of students, which is 71.75. Standard deviation is a measure that describes the level of distribution of average values. In the table above, the standard deviation value is 12,489. The variance is the diversity of values obtained in the experimental class. In the data table above, the experimental class variance value is 155,987. Meanwhile, the maximum score or highest score obtained by students who were taught using the PAKEM learning model assisted by the wordwall game was 95. Meanwhile, the minimum score was the lowest score obtained by students with a score of 50.

3.1.1.2 Categorization of Learning Outcomes

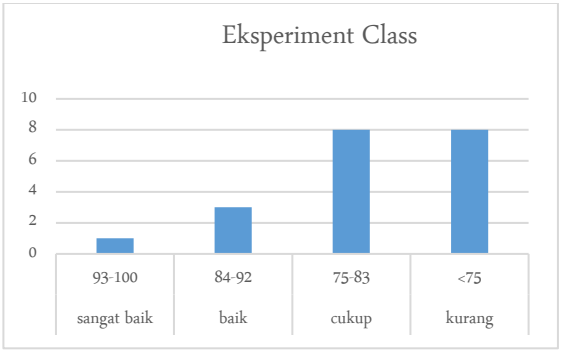

Figure 1. Categorization graph of experimental class learning outcomes

3.1.2 Description of the Learning Results of Students Taught Using the Direct Instruction Learning Model for class VIII B SMPN 2 Bontomarannu

3.1.2.1 Descriptive Analysis Results

Table 2. Descriptive statistical data on physics learning outcomes for class VIII B SMPN 2 Bontomarannu taught using the Direct Instruction learning model

Parameter	Value
Mean	36.75
Standard Deviation	8.472
Variance	71.776
Minimum	20
Maximum	55

In the table, the average or mean value is obtained which shows the overall score obtained by students in the test that has been given, which is then divided by the number of students, which is 36.75. Standard deviation is a measure that describes the degree of spread of average values. In this table, the standard deviation value is recorded at 8.472. The variance, which describes the diversity of scores obtained in the experimental class, was recorded at 71.776. Apart from that, the maximum score shows the highest posttest score on physics learning results obtained by students who were taught using the Direct Instruction learning model, with a score of 55. Meanwhile, the minimum score shows the lowest score obtained by students, with a score of 20.

3.1.2.2 Categorization of Learning Outcomes

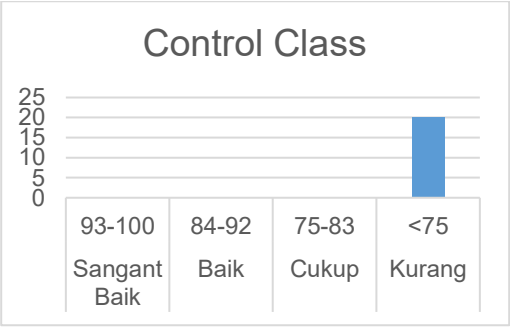

Figure 2. Graph of categorization of control class learning outcomes

The Normality Test is carried out to determine whether the data obtained from respondents is normally distributed or not on student learning outcomes. Normality testing was analyzed using SPSS version 26 for Windows in the experimental class and control class. This test uses the Shapiro-Wilk method at a significance level of α = 0.05 for data from 20 students for the experimental and control classes. It is shown that the normality test in the experimental class has a sig value. < 0.05 on the Shapiro-Wilk test of 0.02. So it can be interpreted that the learning outcome data in the experimental class is not normally distributed.

Meanwhile, the control class has a sig value. >0.05 in the Shapiro-Wilk test of 1.64. So it can be interpreted that the learning outcome data in the control class is normally distributed. Because the experimental class is not normally distributed, the next test will be carried out using Mann-Whitney in SPSS.

Table 3. Calculation results of the Mann-Whitney hypothesis test on physics learning results for class VIII SMPN 2 Bontomarannu

Test Statistics[a]	LEARNING OUTCOMES
Mann-Whitney U	2.500
Wilcoxon W	212.500
Z	-5.375
Asymp. Sig. (2-tailed)	.000
Exact Sig. [2*(1-tailed Sig.)]	.000[b]

Based on the table above, the results of hypothesis testing using Mann-Whitney, the basis for decision making is as follows:

I. If the value of Asymp. Sig. (2-tailed) > 0.05 then H0 is accepted;

II. If the value of Asymp. Sig. (2-tailed) < 0.05 then H0 is rejected.

Based on the table above, it can be concluded that the value of asymp. Sig. (2-tailed) <0.05, namely 0.00, this indicates that H0 is rejected and H1 is accepted so that there is a significant difference in

learning outcomes between students taught using the PAKEM learning model assisted by wordwall games and the Direct Instruction learning model for class VIII SMPN 2 Bontomarannu.

3.2 Discussion

3.2.1 Description of the Learning Results of Students Taught Using the PAKEM Learning Model Assisted by the Wordwall Game for class VIII C SMPN 2 Bontomarannu

Based on research conducted in class VIII C as an experimental class, treatment was given using the PAKEM learning model assisted by the wordwall game. After being given the treatment, the researcher distributed a test in the form of 20 multiple choice questions. questions that correspond to cognitive domain levels C1 to C3. From the research results, it was shown that the average score for the experimental class was 71.75 with the frequency of students who obtained a minimum completeness score being 12 students with a percentage of 60%.

Based on the data above, it can be said that the use of the wordwall game-based PAKEM learning model has an influence on student learning outcomes. Even though the use of the PAKEM learning model is not in the good and very good category. One factor comes from within the student, such as intelligence and motivation in learning. This is also supported by (Uno, 2022) who says that the combination of low intelligence and learning motivation has the most negative impact on learning outcomes.

Then, based on observations in the field, researchers found that when using the PAKEM learning model assisted by the wordwall game in physics learning, students were found to be more active in the learning process, this was indicated by students' enthusiasm in following and being actively involved in the learning process, apart from that, students also asked questions more often, and students were more enthusiastic about being actively involved in answering the questions given.

3.2.2 Description of the Learning Results of Students Taught Using the Direct Instruction Learning Model for class VIII B SMPN 2 Bontomarannu

Based on research conducted in class VIII B as a control class, treatment was given using the Direct Instruction learning model. After being given treatment, the researcher distributed a test in the form of 20 multiple choice questions that corresponded to cognitive domain levels C1 to C3. From the results of the descriptive analysis of learning outcomes, the average score of students in the control class was 36.75 with a maximum score of 55 and a minimum score of 25. From the frequency of students who had learning outcomes In physics, it can be concluded that the physics learning outcomes of students in the control class achieved a minimum completeness score of 0 students with a percentage of 0% in physics learning using the Direct Instruction learning model. This shows that the Direct Instruction learning model is not yet an effective learning strategy for improving students' physics learning outcomes.

The Direct Instruction learning model which only focuses on teaching staff in explaining learning material becomes less interesting and boring. This is because the Direct Instruction learning model does not provide opportunities for students to play an active role in the learning process. This is supported by research conducted by (Hamdani et al., 2021) which states that the Direct Instruction learning model has various shortcomings, such as not motivating students to learn and not developing students' creativity and independence.

3.2.3 Description of the differences in physics learning outcomes for students taught using the PAKEM learning model assisted by Wordwall games and the Direct Instruction learning model for Class VIII SMPN 2 Bontomarannu

The research results show that depending on the significant differences that occur between the learning outcomes of students who are taught using the PAKEM learning model assisted by wordwall games and the Direct Instruction learning model for class VIII SMPN 2 Bontomarannu. This is proven by the results of hypothesis testing analysis using non-parametric statistics, namely the Mann-Whitney test. Based on the analysis of the data obtained, it can be concluded that the value of asymp, Sig. (2-tailed) <0.05, namely .000, this indicates that H0 is rejected and H1 is accepted so that there is a significant difference in learning outcomes between students taught using the PAKEM learning model assisted by wordwall games and the Direct Instruction learning model for class VIII SMPN 2 Bontomarannu.

Based on the table it is shown that the normality test in the experimental class has a sig value of <0.05 in the Shapiro-Wilk test of 0.02. So it can be interpreted that the learning outcome data in the experimental class is not normally distributed. Meanwhile, the control class has a sig value. >0.05 in the Shapiro-Wilk test of 1.64 so it can be interpreted that the learning outcome data in the control class is normally distributed. The data is not normal due to the very large difference between the maximum value and the minimum value in the experimental class.

The use of different learning models and media between the experimental class and the control class provides a significant difference in students' physics learning outcomes. The use of the PAKEM learning model assisted by the wordwall game can help students to learn actively and have fun. Similar to what researchers found in the classroom, students looked active and enthusiastic in participating in the learning, students not only listened silently to the lesson but also expressed their opinions regarding the material being taught. Apart from that, the use of the wordwall game greatly increases students' interest in learning motivation to be actively involved in the learning process, the features available in the wordwall game really attract students' attention. Apart from that, the use of learning videos and the use of power points also helps increase students' interest in the learning process.

4. CONCLUSION

Based on this research, it can be concluded that the learning outcomes of students who were taught using the PAKEM learning model assisted by the wordwall game were obtained by students who achieved the minimum completeness criteria of 60% with a total of 12 students.

The learning outcomes of students taught using the Direct Instruction learning model were obtained by students who achieved the minimum completeness criterion of 0% with a total of 0 students.

There are differences in learning outcomes between students taught using the PAKEM learning model assisted by wordwall games and the Direct Instruction learning model. This can be seen from the value of 0.00 asymp. Sig. (2-tailed) <0.05.

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