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The Effect of Seating Arrangement on Student Understanding in The Subject of Force and Motion for Grade IV Students at SD N 10 Palembang

Aldora Pratama^{1✉}, Arief Kuswidyarko², Septiyawan Abdullah³

¹University of PGRI Palembang, Indonesia

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Abstract

This study aims to determine the effect of seating arrangement on students' understanding of the topic of force and motion among fourth-grade students at SD N 10 Palembang. This research is a quantitative experimental study using a Nonequivalent Control Group Design. Based on the results of the research that has been conducted, students' reading comprehension has improved with the use of this seating arrangement. This is evidenced by the t-test calculation resulting in $t\text{-value} = 2.559$ and $t\text{-table} = 2.069$, yielding a significance value (2-tailed) of > 0.05 . Therefore, it can be concluded that the $t\text{-value} > t\text{-table}$, indicates that H_a is accepted and H_o is rejected. This means that the hypothesis stating that the use of seating arrangement affects the understanding of fourth-grade students at SD N 10 Palembang is accepted.

Keywords: Seating arrangement, Student understanding.

Pengaruh Penataan Tempat Duduk Terhadap Pemahaman Siswa Pada Materi Gaya dan Gerak Siswa Kelas IV SD N 10 Palembang

Abstrak

Penelitian ini bertujuan untuk mengetahui pengaruh penataan tempat duduk terhadap pemahaman siswa pada materi gaya dan gerak siswa kelas IV SD N 10 Palembang. Jenis penelitian ini adalah penelitian kuantitatif eksperimen dengan menggunakan desain Nonequivalent control group desain. Berdasarkan hasil penelitian yang telah dilakukan pemahaman membaca siswa mengalami peningkatan dengan adanya penggunaan penataan tempat duduk ini hal ini dibuktikan perhitungan uji-t di peroleh thitung = 2.559 dan ttabel = 2,069 maka diperoleh hasil nilai sig. (2-tailed) sebesar $> 0,05$. Sehingga dapat ditarik kesimpulan thitung $>$ ttabel bahwa H_a di terima dan H_o ditolak. Hal ini berarti, hipotesis yang menyatakan bahwa penggunaan penataan tempat duduk berpengaruh terhadap pemahaman siswa kelas V di SD Negeri 10 Palembang.

Kata Kunci: Penataan tempat duduk, Pemahaman siswa.

✉ Corresponding Author: Aldora Pratama

Affiliation Address: Universitas PGRI Palembang

E-mail: Aldorapratama7271@gmail.com

INTRODUCTION

Education is an important part of human life. Through education, humans can control themselves, thereby developing their potential through self-control, personality, intelligence, noble character, and skills. Education allows us all to broaden our horizons. The primary target of education is humanity. Education is a conscious effort to prepare learners to play an active, passive, and positive role in their current and future lives. Education helps learners to develop and nurture their human potential. Human potential is the seed of the possibility of becoming human. The word "manusia" originates from the Sanskrit "manu" and the Latin "men," meaning thinking, and intellect, which signifies human. Every human has their inherent characteristics. (Syam, 2021, p. 45).

A school is a place for the process of learning. In the classroom learning process, teaching and learning take place, providing a platform for learners to acquire knowledge. The teaching and learning process is conducted by teachers and learners. In the teaching and learning process, teachers strive to create good teaching and learning conditions. With good learning conditions, it is expected that the learning process will proceed smoothly. Therefore, a teacher must create the best possible learning environment. In creating good learning, teachers must manage their classes well.

According to (Fuadah, 2020, p. 169), seating arrangement variation is one effort in classroom management. The variety of seating models that teachers must use can create a creative classroom atmosphere and enliven the classroom environment. In one class, learners have different characters, traits, natures, and characteristics, so their learning styles and abilities are different. Differences in characters, traits, natures, and characteristics can be seen from the aspects of intelligence, psychology, and biology. With these differences, every individual in the classroom can be different. The teacher's task is how to overcome the diversity of the learners so that the learning objectives can be achieved well. For this reason, teachers must create good classroom management. As a teacher, educators must be able to manage the classroom well. Through proper classroom management, a conducive classroom will be created. The arrangement of the physical classroom environment can be in the form of seating arrangements. Some teachers implement different seating arrangements but don't understand what needs to be done before implementing this.

At present, there are still many teachers who don't pay attention to the physical arrangement of the classroom, especially the seating of students while the learning process is going on, which still uses the same conventional seating. Several researchers conducted research into seating arrangements, namely: Based on previous research on the effect of seating arrangements on learning outcomes (Rina, 2020) stated the research results obtained evidence that the average score of seat arrangement management in the middle/medium category was proven by the percentage table that 19 student samples (67.9%) and the average score of the learning outcomes of IPA taken from the daily test scores of students seen from the percentage table that 20 student samples (71.4%) were in the middle/medium category.

Research conducted by (Fuadah et al., 2020) on the application of seating variation in thematic learning is said to be very successful, where the research uses U-shaped seating variations marked by using the U model of students more enthusiastic, more active, and creative with many questions and answers delivered during class hours compared to traditional or conventional seating models.

According to (Meta et al., 2018, p. 14) several types of seating formations can be used as alternatives such as U-shaped seating formations and chevron formations. The U shape is more effective than the traditional shape, which is reviewed by interactions that are uniform between educators and learners (B R Setiyadi & S D Ramdani, 2017, p. 33). Chevron formations according to (Hamid, 2014, p. 130) can be very helpful in efforts to reduce the

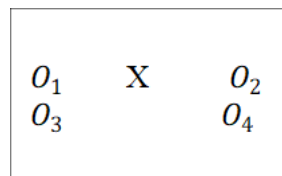
distances between learners and educators so that learners and educators have a better view of the classroom environment and are active in classroom learning.

In the learning process, there is interaction between teachers and students where the learning activities, are carried out to achieve a particular learning goal. One of the learning goals that will be achieved is a good student understanding of the lesson material obtained by students, an understanding that is very influential on the quality and success of the learning. Understanding is a level of ability that shows that students can understand the concept or meaning, situations, and facts known (Yusrizal & Rahmati, 2020, p. 134). Student understanding is evidence of the success that has been achieved by students where every activity can bring about a particular change, in this case, students demonstrate the ability to understand the meaning or concept, situations, and facts that are known.

Based on the description of the problem the researchers will carry out research with the title "The Influence of Seating Arrangements on the Understanding of Students in the Subject of Style and Motion of Students in Grade IV SD N 10 Palembang".

METHOD

Research methods are a way used in research, while research is defined as an effort in the field of science conducted to obtain data and facts systematically and carefully to achieve truth. This research uses the experimental method. The experimental method is a research method conducted through experimentation, which is a quantitative method used to determine the effect of an independent variable (treatment) on a dependent variable (outcome) under controlled conditions. The form of experimental method used is Nonequivalent Control Group Design. This design consists of two groups: the experimental group that receives the treatment and the control group that does not receive the treatment. Subsequently, both groups are given a pretest (O1 for the experimental group and O2 for the control group). Then, the experimental group is given the treatment (X) in the form of a U-shaped seating arrangement. After the treatment, the researcher will conduct a posttest (O3 for the experimental group and O4 for the control group) to determine the results of the treatment given.



Explanation:

X: Treatment given, U-shaped seating arrangement model

O1: Pretest score in the experimental class before treatment

O2: Posttest score in the experimental class after treatment

O3: Pretest score in the control class before treatment

O4: Posttest score in the control class

RESULTS AND DISCUSSION

The research was conducted at SD Negeri 10 Palembang, located on Sultan M Mansyur Street, Lorong Sei Itam Bukit Lama, Ilir Barat 1 District, Palembang City, South Sumatra Province. The research is titled "The Effect of Seating Arrangement on Learning Outcomes in Science Subject Matter of Force and Motion for Fourth Grade Students at SD Negeri 10 Palembang." The purpose of this research is to determine the effect of seating arrangement on learning outcomes in Science subject matter of force and motion for fourth-grade students at SD Negeri 10 Palembang.

After conducting the research, the results included a posttest in the form of multiple-choice questions on the Science subject matter of the water cycle, using different seating arrangements. The test was administered to Class VA as the experimental class and Class VB as the control class. This test was conducted to find out whether the seating arrangement affected students' understanding of the subject matter of force and motion. The test given to the students was a posttest in the form of multiple-choice questions to assess their understanding of the water cycle. Subsequently, data analysis was carried out by the researcher through normality tests, homogeneity tests, and finally, a t-test.

Table 1 Data of Posttest Results for Experimental and Control Classes

Posttest	Biggest Score	Smallest Score	Average Score
Experiment	DS	90	I 60 76,48
	NS	90	
Control	ASP	85	RS 50 69,8

Source: Data Management Program Microsoft Excel

Normality Test of Data

The following are the results of the classical assumption test, namely the normality test of the data using the Kolmogorov-Smirnov test with SPSS version 23, as shown in the table below:

Table 2 Results of Normality Test Calculation

Class	<i>Kolmogorov-Smirnov</i>			
		<i>statistic</i>	<i>Df</i>	<i>Sig</i>
Student Learning Outcomes	Pretest experiment	229	13	0,61
	Posttest experiment	233	13	0,53
Control	Pretest Control	260	12	0,24
	Posttest Control	284	12	0,08

Based on the results of the normality test analysis using the Kolmogorov-Smirnov test with SPSS version 23 above, the data can be considered normally distributed if the significance value (sig) > 0.05. From the table, it can be seen that the pretest experimental class has a significance value of 0.61 > 0.05, thus it can be concluded that the pretest experimental class is normally distributed. The posttest experimental class has a significance value of 0.63 > 0.05, so it can be concluded that the posttest experimental class is normally distributed. The pretest control class has a significance value of 0.24 > 0.05, thus it can be concluded that the pretest control class is normally distributed. The posttest control class has a significance value of 0.08 > 0.05, therefore, according to the explained statement, it can be concluded that the posttest scores of the experimental and control classes are from normally distributed data.

Homogeneity Test of Data

Based on the conclusion of the normality test results for the pretest and posttest data of the experimental and control classes, which have been stated as normally distributed, the data can then be analyzed using the homogeneity test. The calculation results of the homogeneity test for the pretest and posttest data of the experimental and control classes can be seen in the table below:

Table 3 Results of Homogeneity Test Calculation

		<i>Levene statistic</i>	df1	df2	Sig
Student Learning Outcomes	<i>Based on Mean</i>	796	3	46	503
	<i>Based on Median</i>	422	3	46	738
	<i>Based on median and with Adjusted df</i>	422	3	42,852	738
	<i>Based on trimmed mean</i>	726	3	46	541

Based on the results of the homogeneity test analysis using SPSS version 23, the data can be considered homogeneous if the significance value (sig) based on the mean is $0.503 > 0.05$. Therefore, it can be concluded from the calculation results of the pretest and posttest scores of the experimental and control classes that both samples have the same variance (homogeneous).

Hypothesis Testing Results

Based on the normality and homogeneity tests, which show that the data are normally distributed and homogeneous, a hypothesis test was conducted using the t-test (independent sample t-test). With the help of SPSS version 23, the t-test aims to prove the previously formulated hypothesis. The results of the hypothesis test calculation can be seen in the table below:

Table 4.6 Hypothesis Test Results
Independent Sample Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig	T	df	sig (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Learning Outcomes	Equal variances assumed	071	792	2.559	23	018	5,64103	2,20443	1,08082	10,20123
	Equal variances not assumed			2.580	22,717	017	5,64103	2,18667	1,11442	10,16763

Based on the results of the hypothesis test analysis on the posttest scores of the control class and the experimental class using the t-test (independent sample t-test) with the help of SPSS version 23 above, it can be seen that the hypothesis calculation results with the t-test obtained $t_{\text{calculated}} = 2.559$ and $t_{\text{table}} = 2.069$. Thus, the significance value (2-tailed) was obtained to be > 0.05 . Therefore, it can be concluded that $t_{\text{calculated}} > t_{\text{table}}$, meaning that H_a is accepted and H_o is rejected. This indicates that there is a significant effect of seating arrangement on the learning outcomes in Science on the subject matter of Force and Motion for fourth-grade students at SD N 10 Palembang.

Discussion

Based on the validity and reliability tests, the instruments used in this research have a good level of validity and reliability because the results obtained show that the $r_{\text{calculated}} > r_{\text{table}}$, making the instruments appropriate for use in the research. After the research instruments were tested for validity and reliability, and the levels of difficulty and discrimination were determined, these instruments could be used to collect data in the research. The data from the research results were subsequently tested using normality tests, homogeneity tests, and hypothesis tests using the t-test. In this study, the researcher used a confidence level of 95%, so $\alpha = 0.05$ (5%), meaning the error rate should not exceed 5%. From the normality test analysis results, as shown in Table 4.4, the data is normally distributed because the significance value (sig) > 0.05 . The results of the normality test calculations are as follows:

1. The pretest data for the experimental class obtained a result of $0.061 > 0.05$, and the posttest data for the experimental class obtained a result of $0.053 > 0.05$, indicating that the pretest and posttest data for the experimental class are normally distributed.
2. The pretest data for the control class obtained a result of $0.024 > 0.05$, and the posttest data for the control class obtained a result of $0.08 > 0.05$, indicating that the pretest and posttest data for the control class are normally distributed.
3. The t-test results showed $t_{\text{calculated}} = 2.559$ and $t_{\text{table}} = 2.069$, with a significance value (2-tailed) > 0.05 , indicating that H_a is accepted.

From the data analysis results, it was found that the learning activities carried out with the fourth-grade students in the Science subject on the topic of Force and Motion using the seating arrangement model resulted in good scores. In contrast, the learning in the control class using the traditional model resulted in adequate learning outcomes. This is evident from the posttest analysis of the experimental class, which showed a good increase in scores. This research shows a significant effect of seating arrangement on the learning outcomes in Science on the subject matter of Force and Motion for fourth-grade students at SD N 10 Palembang.

The research activity focused on the topic of Force and Motion in the Science subject, theme 7, subtheme 1, lesson 1. The learning process in the two classes differed: the control class used a conventional model, while the experimental class used a U-shaped seating arrangement model. The U-shape model is a way for the teacher to arrange the classroom seating in a U-shape to achieve effective and efficient learning, making the learning atmosphere more active, and resulting in better outcomes. Additionally, students interact directly and are enthusiastic during the learning process because they can get immediate responses from the teacher.

CONCLUSION

Based on the results of the research, it can be concluded that the use of the U-shaped seating arrangement model has an effect on the learning outcomes in Science on the subject matter of Force and Motion for fourth-grade students at SD N 10 Palembang. This can be proven from the average pretest score of the experimental class, which was 56.92, and after

being given treatment using the U-shaped model, the average posttest score increased to 70.76. Additionally, through hypothesis testing with a t-test between the experimental class and the control class, it was found that the hypothesis calculation with the t-test obtained $t_{\text{calculated}} = 2.559$ and $t_{\text{table}} = 2.069$, with a significance value (2-tailed) > 0.05 . Therefore, it can be concluded that $t_{\text{calculated}} > t_{\text{table}}$, meaning H_a is accepted and H_o is rejected. Thus, in this study, it can be concluded that there is a significant effect of the U-shaped model on the understanding of Science on the subject matter of Force and Motion for fourth-grade students at SD N 10 Palembang.

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