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The Effect of Differentiated Learning Assisted by Learning Videos on the Outcomes of Science Learning in Grade IV of State Elementary School 131 Palembang

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Abstrak

The research problem in this study is as follows: Does Differentiated Instruction Assisted by Learning Videos Influence the Learning Outcomes of Science and Social Studies (IPAS) among 4th Grade Students at SD Negeri 131 Palembang?. This research aims to determine whether the application of Differentiated Instruction Assisted by Learning Videos has an effect on the learning outcomes of 4th grade students at SD Negeri 45 Palembang. The research method used in this study is a quantitative method. This study employed three data collection techniques: observation, tests, and documentation. Based on the research conducted by the researcher, the following conclusions can be drawn: 1) To determine whether there is a significant effect on learning outcomes after the implementation of Differentiated Instruction assisted by learning videos, a test consisting of 10 multiple-choice questions was administered to 4th grade students. The use of one class showed that after the application of differentiated instruction assisted by videos, students' learning outcomes improved. The average pretest score was 64.23 (categorized as good), while the average posttest score was 83.57. These results indicate that the use of differentiated instruction assisted by learning videos positively influences student learning outcomes. 2) The hypothesis test results in this study show that the Paired Sample T-Test yielded a significance value of 0.00. Since this value is less than 0.05, the alternative hypothesis (Ha) is accepted and the null hypothesis (Ho) is rejected. Therefore, the hypothesis of this study is "There is a significant effect of Differentiated Instruction Assisted by Learning Videos on the IPAS learning outcomes of 4th grade students at SD Negeri 131 Palembang."

***Keywords**: The influence of Science Learning.*

Abstrak

Masalah penelitian ini sebagai berikut: Apakah Pembelajaran Berdiferensiasi Berbantuan Video pembelajaran Berpengaruh Terhadap Hasil Belajar IPAS kelas lV SD Negeri 131 Palembang?. Penelitian ini bertujuan untuk mengetahui adakah pengaruh penerapan Model Berdiferensiasi Berbantuan Video Pembelajaran Terhadap Hasil Belajar Peserta didik Kelas IV SD Negeri 45 Palembang. Metode penelitian yang digunakan dalam penelitian ini adalah metode kuantitatif. Penelitian ini mengunakan tiga teknik pengumpulan data yaitu observasi, tes dan dokumentasi. Berdasarkan penelitian yang telah di lakukan oleh peneliti dapat di simpulkan bahwa : 1) Untuk mengetahui adakah pengaruh yang signifikan dan Hasil belajar setelah di terapkan Berdiferensiasi berbantuan video pembelajaran yang di lakukan berdasarkan 10 soal yang telah di berikan kepada siswa kelas IV dalam bentuk pilihan ganda dengan menggunakan satu kelas menujukan bahwa kelas yang dilakukan berdiferensiasi berbantuan video pembelajaran pada pretest mendapatkan hasil yang lebih tinggi dengan rata-rata nilai pretest pada memperoleh rata-rata nilai 64,23 dengan katagori baik pada postest memperoleh rata-rata nilai 83,57. Dari nilai tersebut menujukan bahwa penggunaan berdiferensiasi berbantuan video pembelajaran berpengaruh terhadap hasil belajar siswa. 2) Untuk hasil Hipotesis pada penelitian ini menunjukan bahwa dari hasil perhitungan *Paired Sample T-Test* dengan hipotesis yaitu, nilai Signifikansi nya 0,00 jika di bandikan 0,05 maka dalam penelitian ini Ha diterima dan Ho ditolak, maka dari itu hipotesis pada penelitian ini adalah "Ada Pengaruh signifikan berdiferensiasi berbantuan video pembelajaran terhadap pembelajaran IPAS siswa kelas IV SD Negeri 131 Palembang.

Kata Kunci: Pengaruh, Pembelajaran IPAS

INTRODUCTION

Elementary school is the most basic education in formal education. Students have their own uniqueness. This uniqueness causes diverse learning needs, meaning that learning methods and materials need to be adjusted to student characteristics. With differentiated learning, teachers can understand and recognize student characteristics and learning needs. According to (Kristiani, 2021), differentiated learning is a teaching and learning process where students can learn according to their respective abilities so that they are helped and motivated to learn. One of the curricula implemented is the independent curriculum. This curriculum has a framework that focuses on basic material and is more flexible and encourages the learning spirit of students (Rahayu et al., 2022). In the era of modern education, the importance of a learning approach that can meet student needs is increasingly recognized. In the independent curriculum, teachers have the freedom to choose various teaching tools, where the content presented to students will be more optimal with the aim that students can have enough time to explore concepts and strengthen competencies.

Natural and Social Sciences (IPAS) is one of the subjects taught from elementary school to secondary education when the subjects that used to be two main subjects are combined into one, then it will have a new goal. Through natural and social sciences, it is hoped that students can explore Indonesia's wealth further, and utilize the knowledge they have to protect and develop the environment and nature. Learning objectives are the results that students want to achieve after following the learning process. This is important and needs to be considered by teachers in planning learning so that the learning process becomes more focused and effective. In the context of education, success in the field of education is closely related to the learning methods used (Pertiwi et al., 2022).

Based on the results of observations conducted by researchers to teachers and students of grade IV of SD Negeri 131 Palembang, most students still experience learning difficulties such as lack of student activity in participating in the learning process which makes students less interested in learning, especially in science activity materials. The lack of student activity can be seen from being embarrassed to ask questions, not taking notes on material during the learning process. because teachers are still limited to using learning models so that students learn only using the same method repeatedly, namely the lecture method. This can also result in a lack of student understanding so that the scores obtained do not reach the Minimum Completion Criteria (KKM), especially in science subjects, so an effective learning model is needed to encourage students to be more active in the learning process.

To overcome the above problems, the steps that can be taken by educators are to use a more appropriate learning model to enliven the atmosphere in the teaching and learning process so that learning can be active, effective, and efficient and learning objectives can be achieved. The use of repetitive learning models can cause students to get bored and reduce their enthusiasm for learning. Therefore, from this problem, researchers provide a solution to overcome it by implementing a differentiated learning model assisted by learning videos which is a learning method that is carried out to accommodate student needs in the learning process, differences in abilities and interests (Mubarok, 2023). With this model and the use of learning videos that can help students understand complex and abstract learning materials. Learning videos can also improve the quality of learning, develop their imagination and learning outcomes.

Improving student learning outcomes is not only supported but there must be a willingness to learn, so the learning methods used by educators can affect student learning outcomes. In the learning process, many educators still use learning models that are less interesting, causing students to be less serious in learning in class. The use of less interesting learning models can affect the teaching and learning process so that learning motivation decreases, resulting in students becoming inactive when following the learning process in class, of course in social studies subjects which have an impact on student learning outcomes and student learning outcomes can be seen if students can answer correctly the questions given by the educator.

RESEARCH METHODS

The method that will be applied in this study is the experimental method. The experimental research method is a method used to find the effects of certain treatments Arifin, (2020, p.3). The experiment used in this study can be categorized as a quasi-experiment. This study uses three data collection techniques, namely observation, testing and documentation. Data analysis is one of the research processes carried out after all the data needed to solve the problems being studied and the analysis tools greatly determine the accuracy of the conclusions drawn, therefore data analysis activities are activities that cannot be ignored in the research process (Qomusuddin & Romlah, 2021). The data analysis used is the Normality Test, Homogeneity Test, Hypothesis Testing Criteria, Hypothesis Testing Criteria.

RESULTS AND DISCUSSION

Based on the results and implementation of research conducted at SD Negeri 131 Palembang, several results were obtained, starting with validating multiple-choice questions given to students, totaling 10 questions in the form of multiple-choice questions. From these questions, the results of the trial showed that 10 questions were declared valid, which were distributed to students with 54 respondents consisting of classes IVA and IVB.

Description of Diagnostic Assessment Results

A diagnostic assessment was conducted before the implementation of differentiated learning to determine the level of students' initial mastery of the science and science material where only 10 students were sampled. This assessment includes cognitive aspects (knowledge), affective (interest in learning), and individual learning needs (learning styles or students' learning abilities).

The results of the diagnostic assessment show:

1. Most students have a low basic understanding of the science and science material.
2. There is diversity in students' learning styles: visual, auditory, and kinesthetic.
3. Students with a visual learning style show a high interest in video media.
4. Significant differences are seen in the initial abilities between students with fast and slow comprehension.

Tabel 1. Hasil Asesmen Diagnostik

No	Minat Siswa	Pilihab Siswa	Kategori Kemampuan Awal	Keterangan
1	Visual	12	Tinggi	Butuh media visual
2	Auditori	10	Sedang	Butuh instruksi lisan
3	Kinestetik	4	Rendah	Butuh aktivitas fisik

The analysis obtained 60% of students are in the low to medium category in the initial mastery of science material. The majority of students show a visual learning style, which supports the

effectiveness of using learning videos. Differentiated learning is needed so that each student can learn according to their needs.

Tabel 2.
Data on Pre-Test and Post-Test Scores of Experimental Class IVA

No	Nama siswa	Hasil Pre-test		Hasil Post-test	
		Nilai	Katagori	Nilai	Katagori
1	Siswa 1	75	Baik	70	Baik
2	Siswa 2	40	Kurang	60	Cukup
3	Siswa 3	80	Baik	90	Amat Baik
4	Siswa 4	80	Baik	90	Amat Baik
5	Siswa 5	55	Cukup	60	Cukup
6	Siswa 6	80	Baik	60	Cukup
7	Siswa 7	40	Kurang	70	Baik
8	Siswa 8	45	Cukup	60	Cukup
9	Siswa 9	45	Cukup	70	Baik
10	Siswa 10	55	Cukup	50	Cukup
11	Siswa 11	70	Baik	80	Baik
12	Siswa 12	80	Baik	70	Baik
13	Siswa 13	60	Cukup	50	Cukup
14	Siswa 14	60	Cukup	70	Baik
15	Siswa 15	55	Cukup	40	Kurang
16	Siswa 16	80	Baik	80	Baik
17	Siswa 17	65	Baik	60	Cukup
18	Siswa 18	80	Baik	90	Amat Baik
19	Siswa 19	55	Cukup	70	Baik
20	Siswa 20	70	Baik	70	Baik
21	Siswa 21	70	Baik	70	Baik
22	Siswa 22	60	Cukup	45	Cukup
23	Siswa 23	65	Baik	80	Baik
24	Siswa 24	60	Cukup	60	Cukup
25	Siswa 25	65	Baik	75	Baik
26	Siswa 26	80	Baik	80	Baik
Jumlah		1670	Baik	1770	Baik
Rata-rata		64,23		68,07	
Nilai tertinggi		80		90	
Nilai terendah		40		30	

Based on the data in the table above, it can be concluded that the results of 26 students included in the Very Poor (E) category are 0 students, Poor (D) values 2 students, Fair (C) values 10 students, Good (B) values 14 students and Very Good (A) values 0 in the Pretest Results conducted, while in the Posttest Results there are Very Poor (E) value categories 0 students, Poor (D) values 0 students, Fair (C) values 9 students, Good (B) values 12 students and Very Good (A) values 5. From these results, the average number of values in the Pretest was 64.23 with the Good (B) value category 14 students while the Posttest value obtained an average value of 68.07 with the Good (B) value category 12.

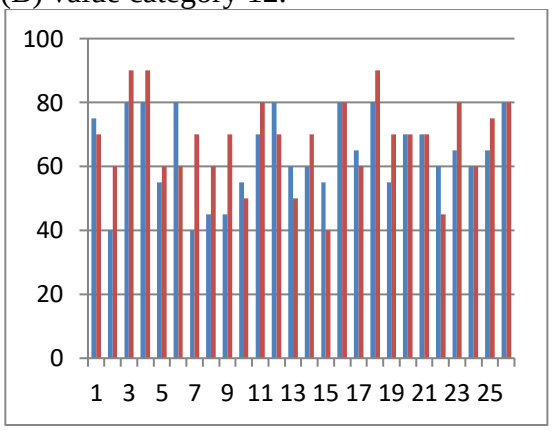

Figure 1. Graph of Pre-Test and Post-Test Scores of Experimental Class IVA

Table 3. Data on Interval, Frequency, and Percentage of Pre-Test and Post-Test Scores of Experimental Class IVA

Tanya ChatGPT

No	Interval	Pretest		Postest	
		Frekuensi	Persentase	Frekuensi	Persentase
1	01 - 20	0	0%	0	0%
2	21 - 40	2	7%	0	0%
3	41 - 60	10	39%	9	35%
4	61 - 80	14	54%	12	46%
5	81 -100	0	0%	5	19%
		26	**100%**	**26**	**100%**

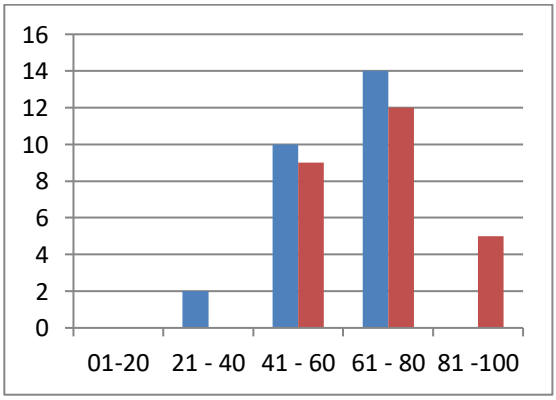

Figure 2. Graph of Pre-Test and Post-Test Scores of Experimental Class IVA

Table 4. Data on Pre-Test and Post-Test Scores of Control Class IVA

Tanya ChatGPT

No	Nama siswa	Hasil Pre-test		Hasil Post-test	
		Nilai	Katagori	Nilai	Katagori
1	Siswa 1	20	Amat Kurang	70	Baik
2	Siswa 2	25	Kurang	70	Baik
3	Siswa 3	35	Kurang	70	Baik
4	Siswa 4	70	Baik	100	Amat Baik
5	Siswa 5	50	Cukup	100	Amat Baik
6	Siswa 6	70	Baik	100	Amat Baik
7	Siswa 7	60	Cukup	90	Amat Baik
8	Siswa 8	40	Kurang	80	Baik
9	Siswa 9	45	Cukup	80	Baik
10	Siswa 10	65	Baik	80	Baik
11	Siswa 11	70	Baik	100	Amat Baik
12	Siswa 12	60	Cukup	80	Baik
13	Siswa 13	30	Kurang	70	Baik
14	Siswa 14	40	Kurang	80	Baik
15	Siswa 15	60	Cukup	100	Amat Baik
16	Siswa 16	55	Cukup	80	Baik
17	Siswa 17	30	Kurang	70	Baik
18	Siswa 18	70	Baik	100	Amat Baik
19	Siswa 19	40	Kurang	70	Baik
20	Siswa 20	50	Cukup	90	Amat Baik
21	Siswa 21	35	Kurang	70	Baik
22	Siswa 22	70	Baik	100	Amat Baik
23	Siswa 23	50	Cukup	80	Baik
24	Siswa 24	40	Kurang	90	Amat Baik
25	Siswa 25	50	Cukup	80	Baik
26	Siswa 26	45	Cukup	90	Amat Baik
27	Siswa 27	40	Kurang	70	Baik
28	Siswa 28	55	Cukup	80	Baik
Jumlah		1370	Cukup	2340	Amat Baik
Rata-rata		48,92		83,57	
Nilai tertinggi		70		100	
Nilai terendah		20		70	

Based on the data in the table above, it can be concluded that the results of 28 students included in the Very Poor (E) category are 1 student, Poor (D) 10 students, Fair (C) 12 students, Good (B) 5 students and Very Good (A) 0 on the Pretest Results conducted, while on the Posttest Results there are Very Poor (E) 0 students, Poor (D) 0 students, Fair (C) 0 students, Good (B) 17 students and Very Good (A) 11 students. From these results, the average number of scores in the Pretest was 83.57 with the Very Good (A) category 11 students while the Posttest score obtained an average score of 83.57 with the Very Good (A) category 11 students.

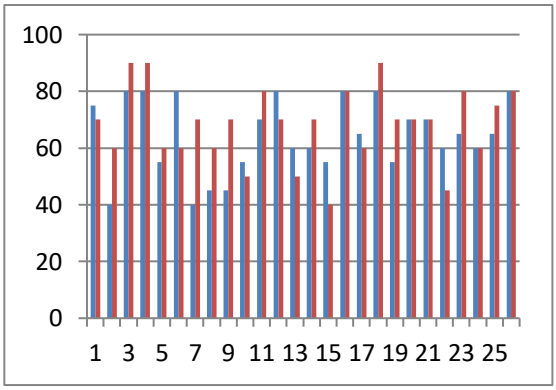

Figure 3. Graph of Pre-Test and Post-Test Scores of Control Class IVA

Table 5. Data on Interval, Frequency, and Percentage of Pre-Test and Post-Test Scores of Control Class IVA

No	Interval	Pretest		Postest	
		Frekuensi	Persentase	Frekuensi	Persentase
1	01 - 20	1	3%	0	0%
2	21 - 40	10	36%	0	0%
3	41 - 60	12	43%	0	0%
4	61 - 80	5	18%	17	61%
5	81 -100	0	0%	11	39%
		28	100%	28	100%

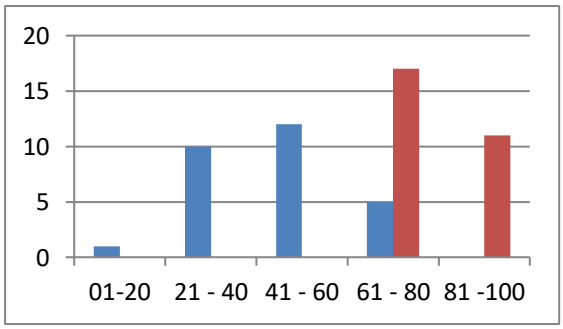

Figure 4. Grafik Nilai *Pretest* dan *Postest* Kelas IVA Kontrol

Analysis of Research Data Results

Before conducting the hypothesis test in this study, a Normality,

Homogeneity, and T-Test were first conducted.

Data Normality Test

Table 6. Results of Normality Test Calculation

One-Sample Kolmogorov-Smirnov Test

		Pretest1	Postest1	Pretest2	Postest2
N		26	26	28	28
Normal Parameters[a,b]	Mean	64.2308	68.0769	48.9286	83.5714
	Std. Deviation	13.09139	13.34743	14.74205	11.61553
Most Extreme Differences	Absolute	.155	.173	.120	.228
	Positive	.114	.135	.120	.228
	Negative	-.155	-.173	-.102	-.171
Test Statistic		.155	.173	.120	.228
Asymp. Sig. (2-tailed)		.109[c]	.045[c]	.200[c,d]	.001[c]

a. Test distribution is Normal.

The basis for decision making in the Kolmogorov Smirnov normality test is: If the significance value (sig) > 0.05 then the data is normally distributed. Based on the table above, the pretest Sig value is 0.120. The posttest Sig value is 0.228. This means that all Sig data > above 0.05 means all data is normally distributed.

Uji Homogenitas Data

Tabel 7. Result Count Homogenitas Data

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.579[a]	.335	.244	11.38151

a. Predictors: (Constant), Postest2, Postest1, Pretest2

b. Dependent Variable: Pretest1

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1434.764	3	478.255	3.692	.027[b]
	Residual	2849.851	22	129.539		
	Total	4284.615	25			

a. Dependent Variable: Pretest1

b. Predictors: (Constant), Postest2, Postest1, Pretest2

The basis for decision making in the homogeneity test is: If the significance value (sig) on Base7d on Mean > 0.05 then the data is homogeneous. Based on the table above, the Sig value on Based on Mean is 0.579. This means that the Sig data on Based on Mean > 0.05 then the data is homogeneous.

Uji-T Data

This study uses the t-test with the Paired Sample T-Test method. The Paired Sample T-Test method is used to compare the difference between two means from two paired samples assuming the data is normally distributed. Paired samples come from the same subject.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest1	64.2308	26	13.09139	2.56743
	Postest1	68.0769	26	13.34743	2.61765
Pair 2	Pretest2	48.9286	28	14.74205	2.78599
	Postest2	83.5714	28	11.61553	2.19513

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pretest1 & Postest1	26	.546	.004
Pair 2	Pretest2 & Postest2	28	.802	.000

Paired Samples Test

		Paired Differences			
					95% Confidence Interval of the Difference
		Mean	Std. Deviation	Std. Error Mean	Lower
Pair 1	Pretest1 - Postest1	-3.84615	12.59426	2.46994	-8.93309
Pair 2	Pretest2 - Postest2	-34.64286	8.81167	1.66525	-38.05967

Paired Samples Test

		Paired Differences			
		95% Confidence Interval of the Difference			
		Upper	t	df	Sig. (2-tailed)
Pair 1	Pretest1 - Postest1	1.24078	-1.557	25	.132
Pair 2	Pretest2 - Postest2	-31.22605	-20.803	27	.000

Based on the table above, it is known that the Sig. (2-tailed) value in Pair

1 (PreTest - PostTest) is 0.000 < 0.05, so H0 is rejected and Ha is accepted. So it can be concluded that there is a difference between the learning outcomes of PreTest and PostTest.

Discussion

This study was conducted in 2 classes that were used as samples for the sample in this study using classes IVA and IVB. The results of this study were obtained from students in classes IVA and IVB of SD Negeri 131 Palembang with a research sample of 54 students. With an average value on the pretest of 48.92% with an increase in the value on the pretest of 64.23% with an increase of 15.31%. In this study, the researcher used an instrument in the form of a Test with multiple choice questions to determine the average value of children on the posttest, higher than the value on the pretest.

According to Purnomo (2017:83) Data Normality is important because with data that is normally distributed, the data can be considered to represent the population.

Based on the Normality test of the data obtained from the Normality test if the data is normally distributed if, Significance Value (sig) > 0.05 then the data is normally distributed, and according to the Normality test criteria if the value (Sig) is greater than 0.05 then the data obtained is normally distributed. Then from the results of the Homogeneity test obtained the data can be categorized as Homogeneous if, If the significance value (sig) > 0.05 then the data is homogeneous, then according to the Homogeneity test criteria if the value (sig) is greater than 0.05 then the data is distributed Homogeneously.

According to Purnomo (2017:100) Homogeneity Test Used to determine the variance of the data population whether the data between two or more groups of data has the same or different variance.

After the Normality and Homogeneity tests were carried out and the data was declared Normal and Homogeneous, the next step was to test the Hypothesis by conducting a T-Test with the Research Hypothesis, namely: for the significance value is 0.00 then for this T-test 0.000 <0.05, then H0 is rejected and Ha is accepted. So there is a difference between the class that was given treatment and the class that was not given treatment. From the results of the study conducted on the Effect of Differentiated Learning Assisted by Learning Videos on the Outcomes of Science Learning in Class IV of SD Negeri 131 Palembang, it was concluded that Learning on Science Learning Outcomes can improve student learning outcomes. It can also be concluded that one of the factors that can influence the level of student understanding is by presenting or explaining the material being studied by linking the real world life of students with the learning that is carried out so that students can think critically and their reasoning in learning can be directed well so that students will find it easier to understand the material they are studying so that the material being studied can be conveyed well to students and students can understand the material explained by the teacher.

The results of the study strengthen previous studies conducted by Asnawai (2021), Rahmat (2023), Latifah (2022) that video-assisted differentiation of learning on science learning outcomes has an influence or can improve learning outcomes well. From several studies, it can be concluded that video-assisted differentiation of learning has a significant effect on both student learning outcomes and student conceptual understanding. This is because the approach applied is in accordance with the 2013 curriculum, students can build their own concepts, students can also find various facts, with a realistic context. So, it can be concluded based on the explanation and data above, it has answered the previously determined problem formulation, namely that it is

proven true that there is a change in learning outcomes after being given video-assisted differentiation of learning on the science learning outcomes of grade IV students of SD Negeri 131 Palembang.

CONCLUSION

Based on the research that has been conducted by the researcher, it can be concluded that video-assisted differentiation of learning is applied in SD Negeri 131 Palembang.

1. To find out whether there is a significant influence and learning outcomes after the implementation of video-assisted differentiation of learning which is carried out based on 10 questions that have been given to grade IV students in the form of multiple choices using one class shows that the class that carried out video-assisted differentiation of learning on the pretest got higher results with an average pretest score of 64.23 with a good category on the posttest getting an average score of 83.57. From this value, it shows that the use of video-assisted differentiation of learning has an effect on student learning outcomes.

2. For the results of the Hypothesis in this study, it shows that from the results of the Paired Sample T-Test calculation with the hypothesis, namely, the Significance value is 0.00 when compared to 0.05, then in this study Ha is accepted and Ho is rejected, therefore the hypothesis in this study is "There is a significant influence of video-assisted differentiation of learning on science learning for grade IV students of SD Negeri 131 Palembang" 3. There is an increase in video-assisted differentiation of learning on science learning for grade IV students of SD Negeri 131 Palembang.

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