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The Effect of The Use of DLM (Digital Learning Material) on Social Studies Learning Outcomes of Fifth-Graders

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Abstract. Modern learning requires the teachers to become facilitators whose involvements are limited. Teachers can use DLM as an alternative support in learning. This study focuses more on describing the effect of the use of DLM (Digital Learning Material) especially in Social Studies subject for fifth-graders. DLM, or *Bahan Ajar Digital* in Bahasa, offers several advantages to support the implementation of active and interactive learning. This research uses a quantitative approach using a quasi-experimental method, and the Nonequivalent Control Group Design. It was conducted at SDN Dadaha, Tasikmalaya, with class V C as the control class and class V B as the experimental class. The control class received learning without DLM (Digital Learning Material), while the experimental class received learning with DLM (Digital Learning Material). The analysis of research data shows the Mean Rank or the average rating of the control class was 15.48, lower than that of the experimental class, which is 33.42. The significance value of the result is smaller than the value of a (0,000 <0.05) thus the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted. It is concluded that the effect of the use of DLM (Digital Learning Material) on the improvement of Social Studies learning outcomes of fifth-graders is evident.

Keywords: DLM, Learning Outcomes

INTRODUCTION ~ Learning process is a system consisting of several components interacting with, related to, and depending on each other. According to Winarno in Prastowo (2014: 18) learning process is essentially an educational process consisting of at least seven components including: first, a clear goal to be achieved; second, the material as the content of interaction; third, students who are actively experiencing; fourth, teachers who carry out; fifth, certain methods for achieving goals; sixth, situations that allow the interaction process to take place properly; and seventh, evaluation of the outcomes of the interactions.

Buchori (2015: 374), "Learning is a combination that includes elements of arrayed human, material, facilities, equipment, and procedures that influence each other to achieve the learning objectives". So, learning is a combination that includes elements composed of humans, materials, facilities, equipment, and procedures that influence each other to achieve learning objectives. The final result in a learning is the achievement of students to achieve the specified learning goals.

Learning outcomes are changes in behavior experienced by students that cover the whole of aspects of students themselves. According to (Susanto, 2013: 5) learning outcomes are changes that occur in students, both concerning cognitive, affective, and psychomotor aspects as a result of learning activities. Understanding the results refers to an acquisition due to an activity or process. So that it can be said the learning outcome is something that is obtained

after making the process of understanding something.

Teachers conduct optimal learning by preparing the plans systematically and effectively. They can use various approaches, models, methods, as well as media and teaching materials, to achieve the planned learning goals. One effort that can be done is to use DLM (Digital Learning Material) in learning. The problem of this research is the effect of the use of DLM (Digital Learning Material) on Social Studies learning outcomes of fifth-graders. This study aims to describe the effect of the use of DLM (Digital Learning Material) on the learning outcomes of fifth-graders.

According to (Berson & Balyta, 2004) digital learning material is often used to compile learning inquiry processes which involve students in research, analysis, and interpretation of primary sources to understand the complexities of the past and the intricacies of social knowledge. Digital learning material includes all material in a digital form with a variety of formats that can be used to help teachers to deliver knowledge to students. Digital learning material can be used to convey a variety of diverse material because it come in various forms including written text, audio, audio visual, animation, and interactive learning questions.

In this era of science and technology development, digital media can be used to combine digital recordings, lectures for Podcasts (for example, iTunes University), sound presentations (for example, PowerPoint), animated screenshots with narration (for example, Camtasia), and other forms of digital audio with instructional methods. As a result, students spend more time learning from digital materials enhanced with audio for formal and informal purposes. Digital learning material offers the digital compression of time as a way to reduce the amount of time students should spend on learning tasks, while maintaining clarity, pitch, and acceptable scores of important dependent actions (for example, remembering, recognizng understanding, satisfying). For example, some research from the 1950s were reviewed and framed in the context of multimedia learning environments. The latest research developments are also reviewed, and discussions are provided, emphasizing on some of the design principles for the new technology.

Instructions in a DLM environment can be designed to help students identify useful information, understand how the material fits together and see how the material relates to prior knowledge (Mayer in Zwart, et al, 2017). In the DLM environment, instruction shifts from a teacher-controlled environment or a traditional system, to a demand-based learning system (Van Merriënboer & Kirschner in Zwart,dkk, 2017).

According to (Yau et al., in Mahendra, 2017), compared to traditional textbooks, one of the advantages of electronic books is the merging of multimedia contents.

Video clips, animations, and games-based education are several elements of electronic textbooks that have been proven to increase students' interest in learning. Second, electronic textbooks allow teachers to adjust and produce contents that can be reinterpreted according to what need to be taught, to the modules that might be appropriate with students' learning styles, regions, language, or skill level, with reference to the standard of education. Furthermore, this book of the latest generation allow students to free themselves from a backpack full of heavy textbooks. Electronic textbooks allow easy backups and replacements as data loss can be easily replaced with a new copy from a server or other storage device. The fifth advantage is quick updates and quick access to the latest content.

Flash book is one of the examples of DLM (*Digital Learning Material*). According to a research by (Mahendra, 2017), it has a significant impact and is effective to improve the learning outcomes of fifth-graders.

This statement was supported by the analysis result indicating t-count (3.979) >t-tabel (1.673) at df.54 and a significance value (Sig.) (2-tailed) smaller than a value (0,000<0,05).

80 is the mean value of students' learning outcomes after using flash books as a teaching material in the experimental class, while students who learned without using flash books in the control class shows a mean value of 71.38. It suggests that the average student learning outcomes in the experimental class are significantly better than that of the control class.

METHOD

Design

Data collection used a quantitative approach with a quasi-experimental method. This research used Nonequivalent Control Group Design. According to Sugiyono (2011: 79), this design is almost the same as the pre-test-post-test control group design, only in this study the experimental class and the control class were not randomly selected. After the determination of the control class and the experimental class, the data collection was conducted by giving a pre-test to both classes at the beginning the research process. This stage aimed to determine the initial ability of the two classes. A post-test was given to both classes after the experimental class was given treatment, to know the effect of giving these treatments to the students' learning outcomes. The formula of the Nonequivalent Control Group Design can be described as follows:

Table 1 Research Design

Group	Pretest	Variabel Perlakuan	Post-test
Eksperimen	O1	X	O2
Kontrol	O1	-	O2

Description :

O1 : *pretest*

O2 : *posttest*

X :*treatment* using the *digital learning material*

The procedure for this experimental research design began with the random selection of subjects from the population. They were then grouped into experimental and control classes. Both classes were given a pre-test to measure the dependent variable of the two classes, then the mean of each class was calculated.

After that, a post-test was given to the two classes and the mean of each class was calculated for the second time. It indicated the difference in the results of the experimental and control classes' pre-test and post-test. A compatible statistic was used to determine the difference from the calculation, to conclude whether the difference was great enough to accept Ha and reject Ho.

The research subjects for the control class were students from class VC of SDN Dadaha, Tasikmalaya, and those from class VB of SDN Dadaha, Tasikmalaya, were selected for the experimental class. Each class received a pre-test at the beginning of the research process. The experimental class received a treatment with DLM (Digital Learning Material). A post-test was then given by the reseachers to test the normality of data in both the control and the experimental classes, and to test the hypotheses.

Data Collection Technique

Data collection was conducted by using a pre-test and a post-test. A pre-test is a series of activities to measure students' understanding before learning. The questions included are the materials that will be taught by the teacher. A post-test is a series of activities to measure students' understanding after learning. This aims to measure the achievement of students' abilities after learning something.

Data Analysis Technique

Analysis of learning outcomes data was conducted using the SPSS 21.0 application. The answers of the students were checked if they were in accordance with the answer key, and a scoring rubric was used. A table was created to present the pre-

test and post-test scores of the 1 and 2 classes. The pre-test and post-test scores were calculated: minimum score, maximum score, and mean score. The score increase in the ability to answer the questions given to students before and after learning is calculated using the *N-gain* formula:

$$(g) = \frac{(\text{postest score}) - (\text{pretest score})}{(\text{max.score}) - (\text{pretest score})}$$

Based on the calculation of N-gain, a hypothesis test was performed using SPSS 21.0 with the following formulation:

Ho : there is no difference between the learning outcomes of students who received treatment with the use of DLM (*Digital Learning Material*) and students who did not receive a treatment with the use of DLM (*Digital Learning Material*).

Ha : there is a difference between the learning outcomes of students who received treatment with the use of DLM (*Digital Learning Material*) and students who did not receive a treatment with the use of DLM (*Digital Learning Material*).

RESULTS

The results of data collection from class VC of SDN Dadaha, Tasikmalaya, as the control class, and class VB of SDN Dadaha, Tasikmalaya, as the experimental class. The control class learned the Indonesian Geographic Condition with the help of printed teaching materials, and the experimental class learned the same lesson with the help of DLM (Digital Learning Material). The results of pre-test and post-test, and N-Gain calculation of the control and experimental classes are presented in Table 2:

Table 2. Pre Test, Post Test, and N-Gain of the Control and Experimental Classes

Student Code	Control Class		N-Gain	Student Code	Experimental Class		N-Gain
	Pre Test	Post Test			Pre Test	Post Test	
SK 1	50	70	0,40	SE 1	60	70	0,25
SK 2	70	80	0,33	SE 2	60	80	0,50
SK 3	60	70	0,25	SE 3	60	70	0,25
SK 4	50	70	0,40	SE 4	50	70	0,40
SK 5	60	70	0,25	SE 5	60	70	0,25
SK 6	60	70	0,25	SE 6	70	80	0,33
SK 7	50	70	0,40	SE 7	70	90	0,67
SK 8	70	80	0,33	SE 8	50	70	0,40
SK 9	50	60	0,20	SE 9	60	80	0,50
SK 10	60	70	0,25	SE 10	70	90	0,67

SK 11	40	50	0,17	SE 11	40	60	0,33
SK 12	50	60	0,20	SE 12	65	80	0,43
SK 13	80	90	0,50	SE 13	60	80	0,50
SK 14	60	70	0,25	SE 14	60	80	0,50
SK 15	65	70	0,14	SE 15	70	90	0,67
SK 16	50	60	0,20	SE 16	80	90	0,50
SK 17	85	90	0,33	SE 17	50	60	0,20
SK 18	70	80	0,33	SE 18	50	80	0,60
SK 19	60	70	0,25	SE 19	40	60	0,33
SK 20	65	70	0,14	SE 20	60	80	0,50
SK 21	50	60	0,20	SE 21	85	100	1,00
SK 22	65	70	0,14	SE 22	60	80	0,50
SK 23	50	60	0,20	SE 23	40	70	0,50
				SE 24	65	80	0,43
				SE 25	65	80	0,43
				SE 26	60	80	0,50
Mean	59,56	70	0,27	Mean	60	77,69	0,7

Information:

SK = Siswa Kontrol

SE = Siswa Eksperimen

Prerequisite Test and Difference Test for Pre-test of Control Class and Experiment Class

Based on the research result in Table 2, normality test was conducted on the pre-test results of the control class and the experimental class use SPSS 21.0 version with the following result:

Tabel 3 Normality Test of Pre-Test Result

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Kelas	Statistic	df	Sig.	Statistic	df	Sig.
Hasil_Belajar	Kelas Kontrol	,202	23	,016	,922	23	,074
	Kelas Eksperimen	,231	26	,001	,930	26	,078

a. Lilliefors Significance Correction

Shapiro-Wilk normality test result shows the significance value of the control class of 0.074> 0.05 and the significance value of the experimental class of 0.078> 0.05. Shapiro-Wilk normality test helps to see that the pre-test results in the control class and

the experimental class are normally distributed.

Homogeneity test was conducted using SPSS 21.0, and the result shows the following numbers:

Table 4 Homogenity Test Post-Test

Test of Homogeneity of Variances

Hasil_Belajar

Levene Statistic	df1	df2	Sig.
,099	1	47	,755

The homogeneity test shows that the significance value is 0.755> 0.05. This suggests that the control class and the experimental class are homogeneous.

With the fulfillment of the prerequisite test, then the t-test using SPSS 21.00 can be done. The result is presented as follows:

Table 5. t-Test

Group Statistics

	Kelas	N	Mean	Std. Deviation	Std. Error Mean
Hasil_Belajar	Kelas Kontrol	23	59,5652	10,86205	2,26489
	Kelas Eksperimen	26	60,0000	11,13553	2,18386

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil_Belajar	Equal variances assumed	,099	,755	-,138	47	,891	-,43478	3,15116	-6,77410	5,90453
	Equal variances not assumed			-,138	46,530	,891	-,43478	3,14626	-6,76594	5,89637

Table 5 shows that the significance value is greater than the value of a (0.891> 0.05). Based on this result, it has been proven that the average student pre-test learning outcomes in the experimental class are equivalent to the average pre-student learning outcomes of the control class. An average value of 59.56 for the control class and 60 for the experimental class.

Prerequisite Test and N-Gain Difference Test of Control Class and Experiment Class

Based on the result of the study in Table 2, the normality test was conducted on the N-Gain values of control class and experimental class using spss 21.0 with the following result:

Table 6 N-Gain Normality Test Result for the Control Class and Experiment Class

Tests of Normality

	Kelas	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
N_Gain	Kelas Kontrol	,217	23	,007	,919	23	,065
	Kelas Eksperimen	,230	26	,001	,903	26	,018

a. Lilliefors Significance Correction

Table 6 shows that the N-Gain pre-test and post-test student learning outcomes of the control class and experimental class shows a significance value of 0.65> 0.05 and 0.00 <0.05, thus H0 is rejected and H1 accepted at the significance level = 0.05. This suggests that N-Gain pre-test and post-test student learning outcomes of the experimental class and the control class are not normally distributed. The hypothesis test using the Mann-Whitney U obtained the following result in Table 7 below:

Table 7 Mann-Whitney Test Result

Ranks

	Kelas	N	Mean Rank	Sum of Ranks
N_Gain	Kelas Kontrol	23	15,48	356,00
	Kelas Eksperimen	26	33,42	869,00
	Total	49		

Test Statistics[a]

	N_Gain
Mann-Whitney U	80,000
Wilcoxon W	356,000
Z	-4,434
Asymp. Sig. (2-tailed)	,000

a. Grouping Variable: Kelas

Mann-Whitney test obtained Mean Rank or average rating of each class. It shows that the control class has the average rating of 15.48, lower than the average of the experimental class, which us 33.42. The significance value of the result is smaller than the value of a (0,000 <0.05), thus the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted. Based on the above result, it has been proven that the average N-Gain of students' outcomes in the experimental class are significantly better than that of the control class. This shows that the learning outcomes of students who received learning with DLM (Digital Learning Material) are better than that of students who did not receive learning with DLM (Digital Learning Material).

DISCUSSION

According to Mayer in (Zwart, et al, 2017), instructions in the DLM environment can be designed to help students identify useful information, understand how the material fits together and see how the material relates to prior knowledge.

Flash book is one of the examples of DLM (*Digital Learning Material*). According to a research by (Mahendra, 2017), it has a significant impact and is effective to improve the learning outcomes of fifth-graders.

Table 6 shows that the significance level of the Shapiro-Wilk test in the control class is 0.65> 0.05 and that of the experimental class is 0.18> 0.05. This indicates that the N-Gain data of learning outcomes in the control class are normally distributed while those of the experimental class are not normally distributed. The Mann-Whitney test is used for the hypothesis test.

Table 7 shows that the Mann-Whitney test obtained Mean Rank or average rating of each class. This suggests that the control class has the mean control rank of 15.48, lower than that of the experimental class, which is 33.42. The significance value of the result is smaller than the value of a (0,000 <0.05), thus the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted.

Based on these results, it is evident that the average student learning outcomes in the experimental class are significantly better. This suggests that the learning outcomes of students who received learning with DLM (Digital Learning Material) are better than that of students who did not receive learning with DLM (Digital Learning Material). It can be concluded that "there is an effect of the use of DLM (Digital Learning Material) on the increase in Social Studies learning outcomes of fifth-graders".

CONCLUSION

Based on the results of data analysis and discussion, it can be concluded that there is an effect of the use of DLM (Digital Learning Material) on the improvement of Social Studies learning outcomes of the fifth-graders.

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