



The Use of Interactive E-Books Digital Literacy to Improve Student Learning Outcomes

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ABSTRACT

The development of ICT-based interactive learning provides opportunities for students to become independent learners. Efforts to develop independent learning by providing digital learning media, such as interactive e-Books Digital Literacy. The development of e-Books aims to increase students' understanding of digital literacy knowledge by emphasizing independent learning. This study aims to analyze the improvement of student learning outcomes by utilizing digital literacy interactive e-books. This research uses a quantitative approach that is descriptive-analytical. This type of research uses an experimental method with true experimental design models Pretest-Posttest Group Design. The Digital Literacy E-Book was developed using the ADDIE model involving 170 students, at Universitas Negeri Surabaya. The results showed that the validity and reliability of the e-Book were in the very decent category. Student response to the readability of the e-book was very well responded with a positive response of 96%. Based on the output of the "independent T-test", it is known that the N-gain for the Experimental Class is 58.9204 or 58.9, 2% higher than the control class of 40.34, 08 or 40.3, 4%. This supports the various advantages provided by the Digital Literacy interactive e-book in increasing student understanding and motivation to learn and develop academic achievement.

Keywords: *E-Book on Digital Literacy, Learning Innovation, Learning Outcomes.*

1. INTRODUCTION

The development of information and communication technology (ICT) rapidly affects the learning process in tertiary institutions. Technology can help teach and learn activities in the process of developing, processing, and presenting learning material so that it is more effective, efficient, and easy for students to understand [1]. The success of the learning process is the main thing in the implementation of education to achieve learning goals. Learning is a process of change or behavior in thinking that is done intentionally which can cause changes between individuals that are carried out naturally from within oneself because of the interaction of individuals with their environment [2][3].

In the learning process in college, the main components are lecturers and students. In order for

the learning process to be successful, lecturers must guide students in such a way that learning objectives in certain contexts can be achieved. One of the efforts to achieve learning objectives is the use of learning resources in the learning process. [4]. Utilization of technology-based learning resources such as the existence of electronic books (e-books) is very necessary [5].

Based on observational data by distributing questionnaires to students of the Faculty of Engineering, Universitas Negeri Surabaya, information was obtained that the learning process for Digital Literacy courses needed innovation in the form of e-books. Digital Literacy interactive e-books are needed because the post-covid-19 lecture system is carried out online so additional learning resources are needed for students independently. Interactive e-book innovations using technology and

communication in education are used to facilitate students and educators in the learning process.

The e-book is essentially a book that is designed in electronic form. Readers need facilities such as computers, netbooks/laptops, smartphones, or tabs to read these electronic products. E-book teaching materials contain material concepts that can be displayed using electronics in the form of computers and Android [6]. E-books can be used as learning resources because they have the advantage that they can be accessed anywhere and are integrated with video, audio, and images that can help students understand lessons [7].

The use of e-books serves to create a learning atmosphere that attracts students' interest in learning and motivates students to continue learning, so as to improve student learning outcomes and achieve learning goals. Learning outcomes are the success rate of students in mastering a learning material in college in the form of values [8]. To obtain data on student learning outcomes, it is mandatory to know the aspects or indicators achieved in learning outcomes, namely 1) the cognitive domain; 2) the affective domain; and 3) the psychomotor domain. This supports the various advantages provided by the Digital Literacy e-book in increasing student learning motivation and developing academic achievement [9].

2. METHOD

The type of research used is quantitative research with descriptive-analytic. The research method uses the Research and Development (RnD) method with the ADDIE model (Analysis, Design, Develop, Implementation, Evaluation). The methods of research and development (research & development) are research methods used to produce certain products and test these products [10]. The research design uses a quasi-experimental design that uses a Nonequivalent Control Group Design. This design was carried out by first giving a pretest to the research sample in the experimental class [11].

The subjects in this study used 70 students of the Information Systems, Faculty of Engineering, Universitas Negeri Surabaya, who were scheduled for the Digital Literacy Course. This research instrument uses observation, interviews, questionnaires, and tests. The data analysis technique used in this study is qualitative and quantitative data analysis. Qualitative data were analyzed by describing the results of observations and interviews, while quantitative data came from response data via a questionnaire to measure the effectiveness and practicality of the Digital Literacy interactive e-book. Student learning outcomes were measured using

pretest and posttest questions which consisted of 30 multiple-choice questions.

Data on the assessment of test results were analyzed using several tests, namely as follows: 1) normality test; 2) t_{test} and N_{gain} score analysis. The t_{test} aims to determine the significant value of the average N_{gain} to the significant value of the increase in student learning outcomes. If the significant value is < 0.05 , it can be concluded that there is a significant difference between the results of the students' pretest and posttest. Hypothesis testing is used to prove an increase in student learning outcomes. The hypothesis in this study is that if $t_{\text{count}} > t_{\text{table}}$ then it can be stated that H_a is accepted, and vice versa. The explanation is that H_o stated that e-books were not effective on learning outcomes, while H_a stated that e-books were effective on student learning outcomes.

3. RESULTS AND DISCUSSION

The results of the analysis of the data obtained from the two classes in a descriptive qualitative manner can be shown in Table 1 and Table 2. The data were obtained from the results of the pre-test and post-test given to students with the help of a questionnaire platform from the g-form. The research was conducted on 2 classes that apply to the Control class and the Experiment class. The Control Class has 36 students while the Experiment Class has 34 students.

Table 1. Descriptives Pretest.

	Class		Statistic	Std. Error
Pretest	Control Class	Mean	53.89	1.557
		Minimum	35	
		Maximum	70	
	Experiment Class	Mean	53.24	1.674
		Minimum	35	
		Maximum	70	

Based on Table 1, the Control Class has an average pretest value of 53.89 while the Experiment class has an average Pretest value of 53.24. The minimum and maximum scores for the two classes are the same, namely 35 and 70. Then based on Table 2, the Control class has a posttest average score of 73.58 while the Experiment class has a Posttest average score of 81.26. The minimum and maximum values for the Control Class are 55 and 90 while the Experiment Class are 60 and 98.

Table 2. Descriptives Posttest.

		Class	Statistic	Std. Error
Pretest	Control Class	Mean	73.59	1.410
		Minimum	55	
		Maximum	90	
	Experiment Class	Mean	81.26	1.564
		Minimum	60	
		Maximum	98	

The next hypothesis analysis test is the distribution of research data. The normality test is used to find out whether the data obtained is normally distributed or not. To test for normality in this study using a parametric statistical normality test that uses the Kolmogorov-Smirnov formula assisted by SPSS version 25 software to calculate it. The following are the results of the normality test in this study.

Table 3. Test of Normality.

	Class	Kolmogorov-Smirnov*			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Pretest	Control Class	.131	36	.125	.961	36	.228
	Experiment Class	.134	34	.125	.954	34	.157

Based on the normality test data in Table 3, the Pretest results for the Control class have a significance value of 0.228 and the Experiment class has a significance value of 0.157. The significance value of the two classes is greater than 0.05. It can be concluded that the pre-test learning outcomes data is normally distributed. Whereas in Table 4, for the Post-test, it states that the Significance value for the Control class is 0.462 and the Experiment class has a significance value of 0.333. It can be concluded that the Posttest learning outcomes data is normally distributed.

Table 4. Test of Normality.

	Class	Kolmogorov-Smirnov*			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Pretest	Control Class	.129	36	.137	.971	36	.462
	Experiment Class	.136	34	.111	.965	34	.333

Furthermore, the homogeneity test aims to determine whether a variant/diversity of data from two or more groups is homogeneous or heterogeneous. The homogeneity test is used for the conditions in the average difference test. Because, if the variance between groups is homogeneous, it will be able to produce accurate measurements in the difference test.

Table 5. Test of Homogeneity of Variance Pretest.

		Levene Statistic	df1	df2	Sig.
Pretest	Based on Mean	.064	1	68	.801
	Based on median	.086	1	68	.770
	Based on the Median and with adjusted df.	.086	1	67.86	.770
	Based on trimmed mean	0.72	1	68	0.790

Based on Table 5, it is known that the value of Sig. Based on the Mean is $0.801 > 0.05$, it can be concluded that the variance of the pre-test group in the control class and experimental class is homogeneous. Table 6 shows homogeneous results in the Post-test group variant with a Based on Mean Significance value of $0.788 > 0.05$.

Table 6. Test of Homogeneity of Variance Posttest.

		Levene Statistic	df1	df2	Sig.
Pretest	Based on Mean	.073	1	68	.788
	Based on median	.065	1	68	.799
	Based on the Median and with adjusted df.	.065	1	66.82	.799
	Based on trimmed mean	0.79	1	68	0.779

Based on the results of normality and homogeneity analysis tests, the independent T_{-test} is part of the parametric statistical analysis used to test whether there is a difference in the mean values of two groups of data that are not mutually exclusive. The results of the parametric test for the effectiveness of using e-books using an independent T_{-test} are shown in Table 7.

Table 7. Descriptives Score N_{gain} (%).

		Class	Statistic	Std. Error
$N_{gain}(\%)$	Control class	Mean	40.3408	3.87747
		Minimum	-26.67	
		Maximum	80.00	
	Experiment Class	Mean	58.9204	3.70101
		Minimum	12.50	
		Maximum	95.00	

The results of the analysis of the effectiveness of using the Digital Literacy Interactive e-book for the control class have a N_{gain} value of 40.3408 or 40.3% in the less effective category to improve student learning outcomes in Digital Literacy courses. Furthermore, it is known that N_{gain} 's average score for the Experimental Class is 58.9204 or 58.9%.

Table 8. Independent Samples Test.

		Levene's Test for Equality of Variances		t-test Equality of Means						
		F	Sig.	t	df	Sig.(2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
N _{Gen}	Equal variances assumed	.182	.671	-3.459	68	.001	-18.5796	5.37192	-29.29911	-7.86010
	Equal variances not assumed			-3.466	67.98	.001	-18.5796	5.36025	-29.27588	-7.8833

It can be concluded that the implementation of learning using the Digital Literacy Interactive e-book is quite effective in improving student learning outcomes in the Literacy course. Learning outcomes, learning behavior, and the psychological state of students can be leveled and show an overall positive effect by using e-books [12]. Thus, through the interpretation in Table 7, it can be said that there are differences in the effectiveness of using e-books in improving student learning outcomes.

Based on Table 8, it is known that the significance value of Levene's Test for Equality of Variances is $0.671 > 0.05$. It can be concluded that the variance of the Ngain data (%) for the Experimental Class and Control Class is homogeneous. Therefore the independent $T_{\text{-test}}$ for Ngain Score is guided by the significance value contained in the Equality of Means. This study shows that using e-book learning media can improve learning outcomes [13][14]. Furthermore, Table 8 obtained a Significance value (2-tailed) of $0.001 < 0.05$. This shows that there is a significant difference in effectiveness regarding the use of Digital Literacy interactive e-books in improving student learning outcomes. There is an increase after using e-book learning media compared to before using e-books [15]. E-books can be used in digital learning modes as well as to train students' metacognitive and self-regulation skills [16]. Satisfaction is a key construct that determines the state of student learning [17].

4. CONCLUSION

This study shows that the use of the Digital Literacy Iterative e-book developed is feasible for distribution. Based on the results of the analysis, there is an increase in student learning outcomes compared to learning without using the Digital Literacy Interactive e-book. E-books can facilitate and motivate students to read more, develop good reading habits, and experience different experiences in reading and learning activities. Therefore, e-books can be an option for students in digital learning mode as well as to train students' metacognitive and self-regulation skills.

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