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Development of Electronic Teaching Material Based on Professional Flip Pdf to Improve Student Learning Outcomes

Iriyani, Sisca Yuni^{1*}, Darmanto, Eko² & Santoso³

^{1,2,3}Master of Basic Education Program, Faculty of Teacher Training and Education, Universitas Muria Kudus, 59327 Central Java, Indonesia

*Corresponding author: siska.gedangalas@gmail.com

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Abstract: The background of this research is that the material in the textbooks used by the fourth-grade teachers is incomplete, unattractive, and does not take advantage of the best information and communication technology developments. The problem in this study is how to develop electronic teaching materials based on Flip PDF Professional, the application of electronic teaching materials based on Flip PDF Professional, and the effectiveness of electronic teaching materials based on Flip PDF Professional social science for grade IV Elementary School. This research aims to produce electronic teaching materials based on Flip PDF Professional, describe the application of electronic teaching materials based on Flip PDF Professional and test the effectiveness of electronic teaching materials based on Flip PDF Professional to improve the learning outcomes of class students IV Elementary School. This research design is Research and Development (R&D) or Research and Development. The data collection techniques used are observation, interviews, tests and documentation. The results of this study are based on the feasibility value of expert validation, indicating that electronic teaching materials are based on Flip PDF Professional. This is worthy of being used as teaching material learning. Besides that, using electronic teaching materials based on Flip PDF Professional effectively improves social studies learning outcomes for fourth-grade elementary school students, with an average N-gain score for the experimental class of 75.82% rounded to 76%.

Keywords: Development, electronic teaching materials, learning outcomes

1. Introduction

Teaching materials developed themselves must be contextual, meaning that they are adapted to the characteristics of the target, which include the social, cultural, geographical environment, stages of student development, initial abilities, interests, family background and others (Dewinta et al., 2021). Therefore, the development of teaching materials must be able to answer or solve problems or difficulties in learning. These difficulties may occur because the material is abstract, complicated, foreign, and so on.

Based on observations in grade IV elementary schools in Sultan Fatah Gugus, it is known that in learning, especially in Social Sciences, teachers only use teaching materials and media in general, such as student books, globes, maps, and pictures. The images used are limited to those in the textbook. The image is black and white, or colour is limited, so it is less attractive even though we know that the internet can quickly get pictures with gorgeous colours that we can print according to the size we need (Klement, Dostál, & Marešová, 2014).

The presentation of material in student materials has not stimulated the courage of students to share experiences related to the material being studied. Students can only write down a little important information based on stories or dialogues that have been read, and teaching materials have not supported the ability of students to formulate and ask questions related to the material. This is considered not to follow the principle of teaching materials that encourage students to ask questions (Anuar, Nizar, & Ismail, 2021).

Exciting and creative teaching materials affect student learning outcomes. When the teacher explains the material and shows the pictures in the book, the students look less enthusiastic. It can be said that learning only uses picture media in books, which is not optimal for learning outcomes (Karmintoro et al., 2021). The learning outcomes of fourth-grade students still need to be improved. The average mid-semester assessment score for elementary schools in the

*Corresponding author: siska.gedangalas@gmail.com

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Sultan Fatah cluster is below the minimum learning completeness standard (SKBM) of 65.00. Such conditions must be addressed immediately.

One of the essences of the 2013 curriculum is contextual learning and character education. In contextual learning, the teacher tries to provide something real following the environment around the child so that the knowledge obtained by the child through the teaching and learning process in the classroom is the knowledge that is built and owned by himself. In other words, providing facilities for learning activities for students to seek, manage, and discover. Learning experiences that are more concrete and relate to students' real life (Ruto et al., 2021). Therefore, in developing learning facilities and resources, teachers, in addition to being able to make their learning tools, must also take the initiative to utilize the environment around the school as a more concrete learning resource. Utilization of the environment as a learning resource,

Electronic teaching materials or electronic books are one of the results of the development of learning facilities and resources. Electronic teaching materials are materials or books published in digital format containing text and images, which can be read through computers or other digital devices (Naim, 2020). Electronic teaching materials are books designed using information and communication technology (ICT) to assist learning in the classroom (Trent & Shroff, 2013).

However, the reality is that learning that occurs in the Sultan Fatah school cluster, Bonang sub-district, Demak district, has not utilized ICT, especially in schools located in suburban areas. This is because the available facilities and infrastructure are minimal. In addition, learning activities have not used information technology as an introductory medium as required in the 2013 Curriculum. On average, students who attend the school come from lower-middle families. So, teachers only use books as material and media in learning. Based on the description above, it is essential to research the development of electronic teaching materials for elementary school students in the Demak district.

The low-grade IV learning outcomes in the Sultan Fatah school cluster are a problem that must be resolved. Electronic teaching materials that display visual elements using real objects coupled with music and explanatory narratives are expected to overcome the problem of low student learning outcomes. Produce electronic teaching materials based on Flip Pdf Professional of social science grade IV elementary school. Describe application-based electronic teaching materials Flip Pdf Professional in learning fourth-grade elementary school. Describe improved learning outcomes for fourth-grade elementary school students after use-based electronic teaching materials Flip Pdf Professional of social science.

2 Literature Review

Electronic teaching materials are developed by considering the characteristics of students, learning theories, theories on how to increase motivation, and material and media aspects in determining the quality of teaching materials. For example, the characteristics of fourth-grade elementary school students at the concrete operational stage will be appropriate if they use real objects and visual aids in their learning (Juraev, 2019). Likewise, with the learning theory, according to Paivio (2014) that knowledge by utilizing audio-visual will facilitate students' understanding.

Seso, Laksana, & Dua (2018) results found the development of multimedia-based electronic teaching materials based on the results of expert trials and students as users' products are as follows 1) The content/content expert trials are in the excellent category. The highest scores are in the aspects of language selection, use of sentences, the suitability of examples and cases, the suitability of practice questions and the usefulness of the content of the material with the development of ICT, 2) Expert trials learning design is in the excellent category, the highest score is in the attractiveness aspect of the cover design and the clarity of writing, 3) the multimedia expert trial is in a good category, the highest score is in the image/illustration aspect, and 4) Student trials as product users are in the excellent category, the highest score is in the video aspect to support material understanding. Thus, developing electronic teaching materials containing multimedia is appropriate for fourth-grade elementary school students.

Nida, Salam, & Haryandi (2021) show the following results were obtained: the lesson plan was categorized as valid and reliable with a value of 3.26 and 0.91; The Learning Outcome Test (THB) is categorized as valid and reliable with a value of 3.29 and 0.97; teaching materials are valid and reliable with a value of 3.24 and 0.90; Electronic teaching materials are classified as practical with a practicality value of 2.84. The electronic teaching materials developed were declared valid based on the results of the assessments of academics and practitioners on lesson plans, electronic teaching materials and THB, which were categorized as good. In addition, the electronic teaching materials developed were stated to be practically based on the participant's response questionnaire instrument. Therefore, it was concluded that the electronic teaching materials developed were suitable to be used to support learning to train students' analytical skills. The research implies that it can be considered in using electronic teaching materials by applying multi models in the implementation of learning to teach students' analytical skills and as one of the information and views for broader research.

Rachim & Ambarwati (2021) results of the study and validation by experts, it can be seen that this flipbook-based electronic teaching material is "Very Appropriate" for use in classroom learning on class XI inventory materials at Yapalis Krian Vocational School with an average score of 83.32% (Very Eligible).

3. Methodology

Developing electronic teaching materials based on Flip Pdf Professional in this study includes several stages: planning, process, evaluation, product validation, product revision, and product use trials. In the design of electronic teaching materials using the Corel Draw 11 application and Adobe Photoshop, the material in the electronic teaching materials is written first in Microsoft Word. Electronic teaching materials presented using professional PDF flip software; fill in the electronic teaching materials using Microsoft Word, Time New Roman 12 font, with A4 paper size, upper margin 4 cm, left 4 cm, right 3 cm, and bottom 3 cm. It can be presented in the form of printed teaching materials. The size of the teaching materials developed is 21cm×29.7cm contents 116 pages.

After the electronic teaching materials have been finished, the electronic teaching materials are applied to experimental schools to find research data. This research was conducted in class IV Public Elementary School No. 2 Serangan as a practical class. The control class was held at Public Elementary School Jatirogo Korwil for Education and Culture, Bonang District. The sample from each class is 27 students. This study carried out health protocols following those recommended by the government. In each research class, a pretest and posttest were carried out (results attached). After the pretest and posttest were carried out, the research data was tested using the SPSS series 23 software. The following is an explanation of the results of the research data test.

4. Findings and Discussion

The improvement of social studies learning outcomes for fourth-grade elementary school students is obtained from the pretest scores before learning using Flip Pdf Professional-based electronic social studies teaching materials and posttest scores after students use Flip Pdf Professional-based electronic social studies teaching materials. The effectiveness of student learning outcomes was first tested using the normalized gain test. Then, the N-gain test was conducted to determine the increase between the pretest and posttest scores. The results of the N-gain test can be seen in Table 1.

Table 1. HN-Gain test results

Class		Descriptive		Statistics	Std. Error			
N-Gain Percent	Experiment	mean		75.8163	2.33574			
		95% Confidence	Lower Bound	71.0151				
		Interval for Mean	Upper Bound	80.6175				
		5% Trimmed Mean		75.8760				
		median		75.0047				
		Variance		147.303				
		Std. Deviation		12.13685				
		Minimum		49.99				
		Maximum		100.00				
		Range		50.01				
		Interquartile Range		16.19				
		Skewness		.041		.448		
		Kurtosis		.275		.872		
		Control	Control	mean			48.6824	1.64356
				95% Confidence		Lower Bound	45.3040	
Interval for Mean	Upper Bound			52.0608				
5% Trimmed Mean				48.5170				
median				49.9932				
Variance				72.935				
Std. Deviation				8.54020				
Minimum				35.29				
Maximum				66.67				
Range				31.37				
Interquartile Range				15.55				
Skewness				-.038	.448			
Kurtosis				-.811	.872			

*Source: Results of SPSS 23 data processing

Based on the results of the calculation of the N-Gain Score, it shows that the average value of the calculation results of the N-Gain Score test for the experimental class at Public Elementary School No. 2 Serangan (Electronic Teaching Material Flip PDF Professional) is 75.82 or 75.82% rounded up to 76% including in the practical category. With an N-Gain Score of 76%. Meanwhile, the average N-Gain score for the control class at Public Elementary School Jatirogo (without Electronic Teaching Material Flip PDF Professional) is equal to 48.68 or 48.68%, rounded off 49% included in the less effective category. With a minimum N-Gain Score of 40% and a maximum of 55%.

Furthermore, the T-Test (Independent Simple T-Test) as a hypothesis test (Average Test) was conducted to determine the difference in average learning outcomes between the experimental and control classes—the results of the T-Test (Independent Simple T-Test can be seen in Table 2.

Table 2. T-Test Results (Independent Simple T-Test)

		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
Student Learning Outcomes	Equal variances assumed	1.907	.173	7.144	52	.000	16.29630	2.28099	11.71916	20.87344
	Equal variances not assumed			7.144	47.324	.000	16.29630	2.28099	11.70837	20.88423

*Source: Results of SPSS 23 data processing

Results t-test (independent sample t-test) with IBM SPSS Statistics software version 23, namely the value of the Experiment Class Pretest and Experiment Class posttest, obtained a significance of 0.173. From these results, it can be concluded that the significance value is $0.173 > (0.05)$, it can be concluded that H1 is accepted and H0 is rejected, meaning that there is a significant difference in the learning outcomes of fourth-grade elementary school students before and after using electronic teaching materials based on Flip Pdf Professional.

5. Conclusions and Recommendations

The design for developing electronic teaching materials based on Flip PDF Professional is required based on the needs of teachers and students. Therefore, the development of these electronic teaching materials is structured through several stages, namely 1) potentials and problems, 2) data collection, 3) product design, 4) design validation, 5) design revision, 6) product trial, 7) product revision, 8) trial use 9) teacher and student responses, and 10) the final product can be carried out in socialization seminars or journals.

The application of IPS electronic teaching materials based on Flip PDF Professional has been proven to improve student learning outcomes in the fourth grade of elementary school. This was proven in the experimental class with the results of 2 tests, namely the initial test (pretest) and the final test (posttest). The final test (pretest) average was 45.31, while the final test score (posttest) was 85.56. Thus, there is a significant difference in the learning outcomes of fourth-grade students in the experimental class.

The effectiveness of social science electronic teaching materials based on PDF Flip Professional Based on the calculation results of the N-gain score test, it shows that the average N-gain score for the experimental class is 76%. Therefore, by looking at the table of N-gain score test results 76), it is stated that the use of electronic social studies teaching materials based on Flip PDF Professional has proven to be effective in improving social studies learning outcomes for fourth-grade elementary school students.

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