The Effectiveness of Interactive Learning Media Based on Adobe Flash in Improving Learning Achievement at Primary Schools

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ABSTRACT

This study aims to determine the effectiveness of Adobe Flash-based interactive learning media that is used in improving the learning outcomes of elementary school students. Student learning outcomes must be improved in order to have competencies by learning outcomes and graduate quality standards. Primary school is the foundation in the education system that must be followed by every student. If a student receives a good and quality education and learning in elementary school, it will be easier to get an education and to learn at the next level of education. The use of adobe flash-based interactive learning media can help students to learn better and easier to understand the learning material. Teachers can create learning to enjoy learning systems and improve student learning achievement. This research uses research and development (R&D) design to produce an adobe flash-based interactive learning media product. The product is firstly carried out due diligence by media experts and learning material experts, which are then conducted experiments. The experiments were carried out on 35 students as the experimental class and 35 students as the control class. Data collected through observation and test student learning outcomes. Data analysis was carried out using descriptive statistics and t-tests to determine differences in learning outcomes between the experimental class and the control class. Based on the overall assessment results of each stage that has been passed, the interactive learning media based on Adobe Flash is feasible to use and shows an increase in student learning outcomes in primary schools. Student achievement using adobe flash-based learning media is better than student achievement in the control class. Teachers can use adobe flash-based interactive learning media in improving the quality of learning and student learning outcomes. This media is very appropriate to be developed in creating a fun learning for students by developing more new teaching materials and motivating students to study hard.

Keywords: Interactive Learning Media, Adobe Flash, Learning Achievement

INTRODUCTION

Education has an essential and strategic role in facing the progress of science and technology that is happening in the current global era. This progress has been responded to positively by every country in the world so that they are able and play an active role in every change and development that is happening at this time. Every human being has the right to get a good and progressive education. Students have the opportunity to achieve a high level of skills, regardless of their own personal and socio-economic circumstances. This progress is marked by the rapid development of technology. Advances and developments in technology can also be used effectively to improve the quality of learning and student learning outcomes in elementary schools. This is shown from research results that technology has a very important role in improving the quality of education (Tearle, 2000) and can make interactive learning successful Al-Ansi (2022). The use of technology has an impact on improving the quality of education

(Chance, Ben-Zvi, Garfield, & Medina, 2007; Amiel & Reeves, 2008; Nincarean, Alia, Halim, & Rahman, (2013). This shows that the use of technology is indispensable in improving the quality of education in the current global era.

The development of science and technology is experiencing increasingly rapid changes and results in competition in the field of life. Mastery of science and technology is very beneficial in human life and leads to global competition between nations which can be prepared through education and learning (Mutohar, et.al., 2020). The development of science and technology can be used to improve the quality of education (Hennessy et al., 2010). Technological developments can also be used to create e-learning modules to improve learning achievement, e-learning modules have many benefits for successful virtual learning (Al-Ansi & Al-Ansi, 2023). Information and communication technology greatly influences the preparation and implementation of learning strategies, teachers can use various media according to the needs and learning objectives (Buabeng-Andoh, 2012). The benefits of using technology-based learning media can not only simplify and streamline the learning process but can also make the learning process more interesting (Al-Ansi, 2022). Utilization of learning media is an effort to support a quality learning process and can improve student learning outcomes.

The use of learning media as an effort to improve the quality of student learning processes and outcomes. Learning media is not only used to assist teachers in delivering learning materials, but also to assist students in learning and understanding learning materials delivered by teachers (Chávez Arcega, 2010; Heinich, Molenda, Russell, & Smaldino, 2012; Sangsawang, 2015). Learning media can be utilized optimally in improving the quality of learning in schools. The use of instructional media appropriately to the objectives and learning strategies used by teachers can help teachers in teaching and can also help students to understand learning material. This condition is very important for the teacher to pay attention to so that the teaching and learning process can run effectively and efficiently so that the learning objectives can be achieved properly.

The teacher's role as an educator must be able to carry out learning tasks well. This learning task is closely related to the teacher's effort to deliver the learning material appropriately and quickly understood by students. The use of instructional media in the learning process can improve students' cognitive abilities in receiving and understanding learning material delivered by teachers (Sun & Cheng, 2007; Blomberg, Sherin, Renkl, Glogger, & Seidel, 2014; Venkatesh et al., 2014). The use of instructional media can also increase the effectiveness and efficiency of the learning process undertaken (Anjarwati, Winarno, & Churiyah, 2016; Yoga, Aryawan, & Juniarta, 2018). This shows that learning media is very important to be used in the learning process. The teacher as a professional educator must be able to develop and use learning media properly so that students have an interest in learning and can understand learning material well. Teachers are required to have an understanding and skill in using information technology as a medium of learning in the classroom.

The development of information and communication technology in education is expected to increase the efficiency and effectiveness of the learning process and the quality of education in Indonesia. The use of interactive learning media in the learning process is an effort to improve the quality of the learning process in increasing student motivation and learning outcomes. The benefit of using learning media is to increase the effectiveness of the learning process, learning attracts more students' attention, and learning material is easier to convey and understand by students. Interactive learning media is one of the computer-based teaching media used in learning at school. Interactive learning media is a combination of text, sound, animation, and video delivered to students via digital devices (Azizah, Rahayu, & Cahyana, 2018; Merkt, Weigand, Heier, & Schwan, 2011). This interactive media is very useful and helps teachers in carrying out active learning processes in class. This learning also provides opportunities for students to examine, analyze, and think by using students abstract power in relating learning materials and knowledge that students already have. This condition requires teachers to be able to create creativity and adaptability to

developments in science and technology so that they can utilize technology in creating effective learning (Al-Ansi, Jaboob, Garad, & Al-Ansi, 2023).

Interactive media has a clear possibility to produce a learning environment that can be used by students to understand learning material more broadly (Plass & Jones, 2012; Lenkeit, 2013). The use of interactive learning media can provide opportunities for students to determine their learning path and is very helpful in absorbing information about the teaching material they are studying. The use of interactive learning media in the learning process depends on student interaction activities with the computer used so that it can support the independent learning process. The use of interactive learning media in the learning process can provide opportunities for students to interact directly with learning materials in interactive media (Merkt et al., 2011). The use of interactive learning media is expected to attract students' attention, make it easier for students to understand learning material, and can provide direct feedback to students on the learning outcomes achieved.

Learning that is carried out traditionally tends to be less attractive to students because there are no interesting learning variations for students to study. Conditions like this can cause difficulties for students to master and understand learning material, especially learning abstract material. Teachers are required to be able to choose and use learning media that are appropriate to the teaching materials that will be given to students. The selection of inappropriate and unattractive media can make it difficult for teachers to convey learning material with abstract concepts and can disrupt the communication relationship between teachers and students. This underlies the need for interactive learning media that can make learning easier to understand and more concrete for students in Elementary School.

The above problems can be overcome by using interactive learning media. Researchers conducted experiments on Adobe Flash-based interactive learning media as a medium in the learning process that could be created to be more interesting. Adobe Flash-based interactive learning media is a learning medium that combines videos, audio, photos, graphics, animations, and text that is packaged in an integrated and interactive and exciting way. Adobe Flash-based interactive learning media can create a pleasant learning atmosphere so that it will foster higher learning motivation in students. This trial was conducted to determine the effectiveness of adobe flash-based interactive learning media in improving student learning outcomes in Islamic elementary schools in Tulungagung.

METHOD

The purpose of this study is to examine the effectiveness of adobe flash-based learning media in improving student learning outcomes in primary schools. To achieve this goal, this study uses the development research design carried out in elementary schools. This research and development use the R&D or Research and Development method. Research and Development is a research method used to produce a product and test the effectiveness of the product (Sugiyono, 2011: 297). The steps in this study follow the steps of the ADDIE research model developed by Dick & Carry (Nadiyah & Faaizah, 2015; Rossi & Mustaro, 2013). The procedure of research and development of the ADDIE model consists of five steps namely; (1) Analysis (analysis), (2) Design (design), (3) Development (development), (4) Implementation (implementation) and (5) Evaluation (evaluation).

The first stage is Analysis, and this stage is carried out to analyze the needs of students in learning and identify the problems that arise in the learning process. Activities conducted by the researcher in the analysis phase include location selection, needs analysis, and material analysis. The second stage is design; the activities at this stage are designing and preparing learning media by assigning users, determining competencies, selecting material, creating storyboards, and preparing instruments. The third stage is development, the activities carried out at this stage of development are to realize product design in physical

form (finished products) using the facilities provided in Adobe Flash CS 3 Professional software, then validated by media experts and validation of material experts as well as revisions to product development results based on advice from experts. The fourth stage is the implementation of activities by applying the product of the development results that have been validated and revised in the learning process in class V Elementary School which is attended by 35 students, then students work on the test questions and fill in the student response questionnaire. The fifth stage is Evaluation, the activity at this stage is to evaluate and improve the product development results based on the analysis of data and information obtained from experts, teachers, and students, to produce quality products. If interactive learning media based on Adobe Flash has been said to be feasible, then researchers do not need to revise the product, and the product is ready for use, but if the product has not been said to be feasible, it must be revised first before becoming the final product development.

Data collection in this study began from expert validation and field trials so that the feasibility and effectiveness of the products that had been developed were known. The expert validation test was carried out by a team of experts in the field of learning media development consisting of 2 media experts and two material experts, while the field trials were carried out in the classroom in the learning process activities of 35 students as potential users of the products developed in Islamic Primary Schools. Data collection techniques used in this study were questionnaire and test techniques. The media expert validation questionnaire was used to validate Adobe Flash-based interactive learning media products so that the validity of the products in this study can be known. A student response questionnaire is given to find out the response or response given by about interactive learning media based on Adobe Flash. Test questions are given to students to find out the effectiveness of the product developed by looking at the completeness of student learning outcomes.

Analysis of the data in this study began with the product validity test of adobe flash-based interactive learning media experts by comparing the ideal number of scores given by the validator (ΣR) with the ideal number of scores set in the learning media validation questionnaire (N) (Arifin, 2010). Product trials are carried out using the One-Group Pretest-Posttest Design technique (Sugiyono, 2016). The design of this trial requires a pretest before students get treatment in learning activities with adobe flash-based interactive media. The pretest of the trial results is expected to show high accuracy because the results can be compared with after the treatment (comparison of pre-test and post-test results). This design can be described as follows: O1 X O2, O1 is the value before the product trial run, and O2 is the value after the trial run or post-test. These data will be analyzed using descriptive statistical data analysis techniques (mean, median, mode, and percentage) and t-test to determine the level of difference between the pre-test and post-test results.

RESULTS AND DISCUSSION

Adobe Flash-based interactive learning media is designed based on the storyboard design to help students understand the teaching material delivered by the teacher. The program used to translate interactive learning media designs is Adobe Flash CS 3 Professional, Corel Draw, and Photoshop. Adobe Flash-based interactive learning media uses ActionScript as the language used in programming. This Adobe Flash-based interactive learning media design contains a menu display with an extension file format (.exe) that is designed based on teaching material that will be taught to students.

The design of interactive learning media based on Adobe Flash before being tested in class is first reviewed and assessed the feasibility of the media and its effectiveness in its use. Assessment of the feasibility of interactive learning media based on Adobe Flash has used an assessment questionnaire from media experts and material experts. The assessment of the feasibility aspect is divided into four indicators, namely; (1) display quality, (2) programming, (3) ease of operation in learning, and (4) selection of supporting items. The results of an assessment of adobe flash-based interactive media can be explained in the picture as

follows:

Table 1.1 Results of Data Analysis Validation of Adobe Flash-Based Learning Media from Media Experts

ANALYSIS OF OVERALL ASSESSMENT				
	Score			
Indicator	∑x	∑xi	(%)	Criteria
Display quality	55	64	86%	Very good
Programming	20	24	83%	Very good
Ease of operation in learning	15	16	94%	Very good
Selection of supporting items	14	16	88%	Very good
Average Total Score	104	120	87%	Very good

The data in table 1 above shows that the overall percentage score for the display quality indicator reaches 86% with excellent criteria, programming indicators score 83% with excellent criteria, indicators of ease of operation in learning get a score of 94% with very good criteria, and supporting item selection indicators obtained a score of 88% with very good criteria. The average total score from the assessment of the four indicators of media aspect validation as a whole reached 87% and included in the "Very Good" criteria. Based on the acquisition of an average total score of 87% (excellent criteria), the quality of Adobe Flash-based interactive learning media development results in terms of the results of the assessment of the media experts as a whole is in the criteria very feasible and ready to be implemented in the learning process.

The assessment of the feasibility aspects of the material in research and development is divided into 5 indicators namely; (1) the appropriateness and accuracy of the material, (2) the truth of the concept, (3) the language in the presentation of the material, (4) the systematic presentation of the material, and (5) the suitability of the evaluation tools. Data from the expert assessment of learning material can be seen in Table 2 as follows.

Table 2. Overall Material Expert Validation Data Analysis Results

ANALYSIS OF OVERALL ASSESSMENT				
	Score			
Indicator	∑x	∑xi	(%)	Criteria
Material eligibility and accuracy	32	32	100%	Very good
The truth of the concept	14	16	88%	Very good
Language in the presentation of material	18	24	75%	Good
Systematic presentation of material	29	32	91%	Very good
Suitability evaluation tools	12	16	75%	Good
Average Total Score	105	120	88%	Very good

The data in table 2 above shows that the overall percentage score for indicators of eligibility and material accuracy is 100% with excellent criteria, indicators of truth of the concept score 88% with excellent criteria, linguistic indicators in material presentation get a score of 75% with reasonable criteria, systematic indicators of presentation of material obtained a score of 91% with excellent criteria, and the suitability of the evaluation tools obtained a score of 75% with suitable criteria. The average total score of the assessment of the five indicators of material validation as a whole reached 88% and included in the criteria of "Very Good." Based on the average total score of 88% (excellent criteria), the quality of the material in Adobe Flash-based interactive learning media development results was reviewed from the results of the assessment

of material experts as a whole are in the criteria very feasible and ready to be implemented in the learning process.

Interactive learning media that has passed the stages of validation of media experts and material experts, then subsequently tried out in the stage of field trials. The sample used in the field trial was 35 students in the experimental class. Assessment of the; teachers' aspects of student responses at this stage of field trials are divided into three indicators, namely; (1) the appearance of instructional media, (2) understanding of the material, and (3) interest in the learning material and media. Data on the results of student responses can be seen in Table 3 as follows.

Table 3. Results of Analysis of Student Response Data in Field Trials

Student Response				
	Score			
Indicator	$\sum x$	$\sum xi$	(%)	Criteria
Display learning media	275	288	95%	Very good
Understanding of the material	274	288	95%	Very good
Interest in learning materials and media	364	384	95%	Very good
Average Total Score	913	960	95%	Very good

The data in table 3 above shows that the acquisition of percentage scores for learning media display indicators reached 95% with very positive criteria, indicators of understanding of the material obtained a score of 95% with very positive criteria and indicators of interest / interest in learning materials and media obtained a score of 95 % with very positive criteria. Student responses to the three assessment indicators obtained an average total score of 95% and included in the criteria of "Very Positive." Based on the acquisition of an average total score of 95% (very positive criteria), the quality of interactive learning media based on Adobe Flash development results was reviewed in terms of the response assessment results students are on useful criteria for use in the learning process.

Interactive media based on Adobe Flash can be said to be effective if≥80% of students who haveparticipated in the learning process can achieve the reference value of success indicators of achievement of essential competencies determined. Thus, the criteria for completeness is a minimum of 80% of all students who are subjected to trials fulfilling learning completeness that can achieve a value of 75 (a maximum value of 100). In this study, given and post-test to experimental class students and control class students.

The learning process is carried out by implementing an interactive learning media based on Adobe Flash that has been developed by researchers. Furthermore, the post-test questions given to students when the learning process has finished. The post-test was conducted to find out the extent to which students' abilities in mastering learning material after the learning process was carried out using interactive Flash-based learning media. The results of the post-test analysis about the effectiveness of using adobe flash-based interactive learning media can be seen in the experimental results as follows:

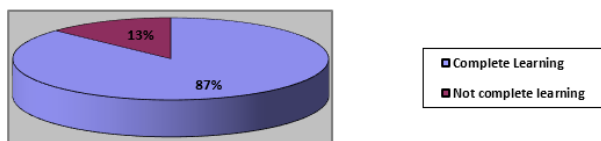Table 4. Analysis Results of Adobe Flash-Based Interactive Media Trials in Primary Schools

Activity	N	Median	Standard Deviation	Value of t Calculate	Df	t-table
Experiment 1	35	68,67	2,00			
Experiment 2	35	71,28	1,80	10,45	70	2,00

Experiment 2	35	71,28	1,80	9,34	70	2,00
Experiment 3	35	76,19	2,79			
Experiment 1	35	68,67	2,00	14,14	70	2,00
Experiment 3	35	76,19	2,79			

Based on the results of the analysis above shows that the results of the second trial have a more excellent value than the results of trial 1, namely: 71.28> 68.67, and t count 10.45> t table 2.00. The average value of trial 3 gets more significant results and is significantly different from trial value two which is 76.19> 71.8 and the value of t arithmetic 9.34> t table 2.00. The average value of trial 3 is more excellent with trial 1, which is: 76.19> 68.67 and the t value is 14.14. t table 2.00. The results of this analysis indicate that the development of adobe flash-based interactive media which became the hypothesis in this study proved useful based on the results of field trials in elementary schools.

The adobe flash-based interactive learning media in improving students' learning abilities shows that it is beneficial to be used in creating active learning in elementary schools. This is also strengthened from the results of the post-test implementation, which can be seen in the picture as follows:
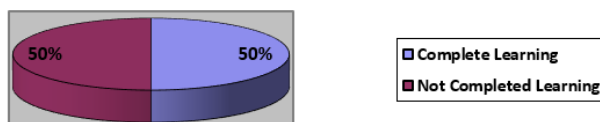

Figure 2. Comparison of Post-Test Results between Experiment Class and Control Class

Data on Figure 2 above shows the percentage comparison of post-test results between the experimental class and the control class. Mastery learning students in the experimental class by 87%, while in the control class is only 50%. Therefore, it can be concluded that there are differences in learning outcomes using interactive learning media based on Adobe Flash that have been developed. Based on the acquisition of the percentage of students' mastery learning after the product is implemented in learning (experimental class) by 87% ≥ 80%, the quality of interactive learning media is based Adobe Flash development results in terms of the analysis of student learning outcomes are ineffective criteria used to improve student learning outcomes in elementary schools.

DISCUSSION

The quality and results of learning are essential things to consider by the teacher in carrying out the learning process in class. Quality learning can deliver students to achieve success in mastering learning material delivered by the teacher. To create quality learning, there is a need for dialogic communication between the

teacher and students who are multi-directional. This dialogic learning process is essential to consider in creating success in classroom learning (Bertau & Tures, 2019). The implementation of the learning interaction process also requires media that can be used to improve the quality of learning. The use of technology media in the learning process can improve the quality of student teaching and learn (Mwandosya, 2019).

Adobe Flash-based interactive learning media is instrumental to be used in improving student learning outcomes in elementary schools. This interactive learning media is very supportive in increasing students' understanding of teaching material that will be delivered so that it can improve student learning outcomes (Anjarwati et al., 2016; Boulos, Warren, Gong, & Yue, 2010; O'Byrne, Patry, & Carnegie, 2008; Pakhrurrozi, Sujadi, & Pramudya, 2017). Similar research has also been carried out by Altiner (2011) about Integrating a Computer-Based Flashcard Program into Academic Vocabulary Learning, which concluded that the use of the Computer-Based Flashcard program could improve students' abilities in learning. These findings are very supportive of the findings of this study, which explains that the implementation of learning in the classroom needs adobe flash-based interactive learning media or also by using technology to help students understand teaching material delivered by teachers in the learning process in class.

Based on the results of research conducted in Islamic elementary schools with respondents 35 students for the experimental class and 35 students for the control class shows that there are significant differences between learning using adobe flash-based interactive media with control classes that do not use adobe flash media. This finding is also strengthened by the results of research showing that Adobe Flash media can improve student learning outcomes (Boulos, Warren, Gong, & Yue, 2010; Rahmaibu, 2017; Rahmawati, 2018). These findings indicate that the use of instructional media in the active learning process in the classroom is needed to be able to support in improving the quality of learning so that students can improve learning outcomes by the competency standards to be achieved in the implementation of the learning process in school.

Learning media have a significant contribution to improving the quality and quality of learning. The presence of media helps teachers and students in the learning process in class. This is because each learning material can be explained more easily and concretely using learning media. Learning media can help students understand teaching material quickly so that students can improve learning achievement (Abdollah, Ahmad, & Akhir, 2010; Aji, Hudha, Huda, & Gufran, 2018; Paakkari, Rautio, & Valasmo, 2019; Ståhl & Kaihovirta, 2019). Learning media used by teachers make students happy and have an interest in following the learning process in class. Interest in learning can build student enthusiasm in implementing the learning process properly. Interactive learning media can also present learning concepts to be more concrete and more easily understood by students in the learning process in class. Interactive media can also be designed so that students can carry out contextual learning by presenting real events in the learning process.

CONCLUSION

Quality and attractive learning is a concern for every teacher to be able to carry out the learning process effectively and efficiently. Active learning can deliver students to get competencies that are by the quality standards of learning set by the school. If the teacher wants to create learning that can attract students 'interests and is useful in carrying out learning activities, then the teacher can use appropriate interactive learning media and attract students' learning interests. The intended learning media is adobe flash-based interactive learning media. This Adobe Flash-based interactive learning media has proven to be very useful in improving student learning outcomes in primary schools. This media has a beautiful design by combining text, sound, music, animation, and video. The learning that is carried out becomes exciting and can increase students' interest in learning and to understand the learning material well. The results of the data analysis show that interactive learning media based on Adobe Flash can improve student learning outcomes in

primary schools. This learning media is declared feasible and can be implemented in the learning process. While the results of data analysis on the aspect of media effectiveness show that interactive learning media based on Adobe Flash is effectively used in improving student learning outcomes. The use of Adobe Flash-based learning media can be combined with a variety of different learning methods or models so that learning becomes more enjoyable for students.

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