The Development of Instructional Multimedia Using Whiteboard Animation Techniques to Improve Students' Ability in Developing Class Action Research

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Abstract

The complaint about the lack of various instructional media utilization omitted by the tutors in the face to face class of Universitas Terbuka (the Indonesia Open University) influenced the low quality of the final assignment of the Classroom Action Research course. This research and development study involves the experimental use of Whiteboard Animation media in a tutorial. This study aims to improve the ability of students to develop Classroom Action Research through the use of this media. The data collection was done by the questionnaire conducted for to Primary Teacher Education *and* Kindergarten Teacher Education *in the first, second, and third levels in the academic year 2019, in Pati, Central Java. The data analysis technique of this research is the mix method, consisting of qualitative and quantitative methods. The results showed that the Whiteboard Animation media had a positive effect on the ability of students to develop Class Action Research. The mean value of the class with Whiteboard Animation was 88.52, which was higher than the average value of the class without Whiteboard Animation at 72.63. The suitability of the media colours and choice of display backgrounds were identified as the media's weaknesses.*

Key Words: *classroom action research, whiteboard animation*

Introduction

Instructional media helps the learning process to be effective and fun. Instructional media not only influences the development of interests, attitudes, social skills, emotions and reasoning (Usman, 2001), but is also able to make material more lively and make the

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learning experience more individual (Gardner, 1991). Students can access the material according to their abilities and explore material more deeply (Salman, 2019).

Tutorials at the Universitas Terbuka function as a study aid, as a forum for students to communicate the difficulties of learning. In distant and independent learning systems, the in learning process is independent learning. However, in the Class Action Research (CAR) course the tutorial process becomes the main forum, where the students gain experience from the supervisors in conducting CAR. Comprehensive guidance cannot be done part by part without knowing the complete cycle. Guidance also cannot be done using a tutor-centred approach without the student's individual work progress. The use of instructional media which is non-optimal causes low attention during the tutorial process. The low attention of students will lead to low comprehension, which means that the tutorial will not achieve adequate results. One of the outputs of the CAR courses are Professional Ability Improvement CAR reports. One of the outcomes of the CAR training is to improve the professional skill of the college students in composing the CAR report. The low quality of CAR reports is seen from the low quality of the processes and findings of learning problems, problem formulations, selection of learning methods and media, design of learning steps and systematic reporting.

The purpose of this study is to describe the influence of a multimedia-based tutorial media using Video Scribe White Animation towards improving students' ability to design CAR, as guided by the following research question:

To what extent does the development of tutorial media based on Video Scribe White Animation affect the students' ability to design CAR?

Literature Review

Instructional media offer a tool to stimulate students' senses. Instructional media as software contains messages, but physically the media can be seen, heard or touched with the five senses such as radio, television, modules, computers, radios, video recorders (Azhar Arsyad, 2012). The benefits of media of learning include making the learning process more interesting, creating more meaningful material, introducing more varied teaching methods and increasing students' performance of learning activities (Sudjana, as cited in Azhar Arsyad, 2012). In addition to video media, there are graphic media and audio media.

Instructional media development is an effort to formulate a media program that is focused on media planning (Daryanto, 2010). The media is designed according to the demands of learning. Development is carried out in accordance with the characteristics of the material, theory or practice. Media such as films, music videos, and visualisation enable the display of very complex ideas in a very short period of time (Aqib, 2017).

Visualisation of the CAR can be clarified through the instructional media. The instructional media can describe each step of the CAR process in detail (Depdiknas, 2007). Guidance is specifically and clearly formulated to achieve the main goal, namely students are able to implement and compile CAR reports. The instructional media is the right solution to visualise the goals of CAR that are to be achieved. One of the steps to visualise CAR is displayed through Video Scribe White Animation-based media. The instructional media will be developed through this research. The Scribe White Animation video will also be examined by evaluating the value of its expediency. The Instructional media is expected to increase the students' interest and improves their skills in composing a CAR.

White Board Animation is a video that facilitates drawing and writing text directly on a digital board (Sparkol Group, 2019). Students can be involved (Grupoboom, 2019) in

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drawing and storytelling activities in digital board media. With the students' interest piqued, the learning material will be retained in the mind for a longer period. White Board Animation is a communication medium that utilises symbols, in the form of words or sentences, accompanied by moving images. By implementing the White Board Animation media, it is expected that CAR course tutorials can be more easily understood.

CAR is done by the teacher through self-reflection. It is carried out to improve teacher performance so that it can improve students' abilities (Wardhani, 2011). The expected results through CAR are improvement in the quality of the process and learning outcomes, improvement in the quality of media, learning aids, and learning resources, as well as in the quality of procedures and evaluation tools (Muhammad Ashori, 2007).

Research Methodology

This research uses mixed methods design. Qualitative methods are used to describe the understanding of the CAR proposal material to Elementary Education students and to describe the process of using Whiteboard Animation media. A quantitative approach is used to analyse the effectiveness of the media. Development of model design is done through descriptive analysis methods, participatory collaborative methods, and experimental methods. Descriptive analysis is used to factually analyse increased understanding of CAR material.

Instructional media development is carried out through ten steps (Borg & Gall, 2007), namely: 1) Research and Information collecting, 2) Planning, 3) Develop preliminary form of product, 4) Preliminary field testing, 5) Main product revision, 6) Main field testing, 7) Operational product revision, 8) Operational field testing, 9) Final product revision, and 10) Dissemination and implementation.

The research sample consisted of 2 classes, the experimental class (25 students) and the control class (23 students). Sampling was carried out through three levels of Dick and Carey's formative evaluation (Borg and Gall, 2007: 591) namely one-on-one involving up to 5 students at the first level, 10 students at the second level, and the whole class of 25 students at the third level. The field test was conducted for a limited time using a purposive sampling technique with each of the five students with high, medium, and low scores. While the field test subject consisted more broadly than 10 students.

Data collection was conducted using a Likert scale questionnaire with a score of 1-5. Material validation includes: the quality of the material, the quality of the language, and the quality of the practice questions. Validation of media instruments was conducted by learning media experts according to the following assessment indicators: media efficiency, button functions, and physical quality. User validation was carried out according to the following indicators: programming aspects, content aspects, and display aspects. Qualitative data were obtained by interviews, questionnaires, and documentation studies. Product development was carried out through alpha and beta tests, and final evaluation through namely by paired sample t-test (Siregar, 2013).

Findings and Discussion

The whiteboard animation media with scores between 3.68 and 4.40 are proven suitable. Validation items include colour match, animation appeal, and background.

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Table 1
Descriptive Analysis R Classical Field Test

		Classical Average	Classical Score
N	Valid	14	14
	Missing	0	0
Mean		4.1457	103.6429
Median		4.1600	104.0000
Mode		4.00	100.00
Std. Deviation		.30244	7.56111
Minimum		3.68	92.00
Maximum		4.52	113.00

Field tests show a minimum value of 3.68 for the items "Colour Suitability" and "Suitability for background selection". This minimum value is consistent with the assessment of the two previous tests, the one-on-one test and the small group test. A maximum value of 4.52 was achieved for the item "There are no distorted words / sentences"; this value is consistent with the value of the small group test suggesting that the media in terms of word and sentence structure is rightly suitable.

The average value of respondents' responses to the Whiteboard Animation media was 4.14 (between 3.68 and 4.40); the average value is categorised well (on a scale of 1-5) and suggest that in general the items are suitable. This average value includes the results of the Operational Trial assessment and the results of the interview. High score of operational trials shows that students are interested in the tutorial process with Whiteboard Animation media, while High score for interview results show that students feel happy to enjoy the tutorial offerings with Whiteboard Animation media.
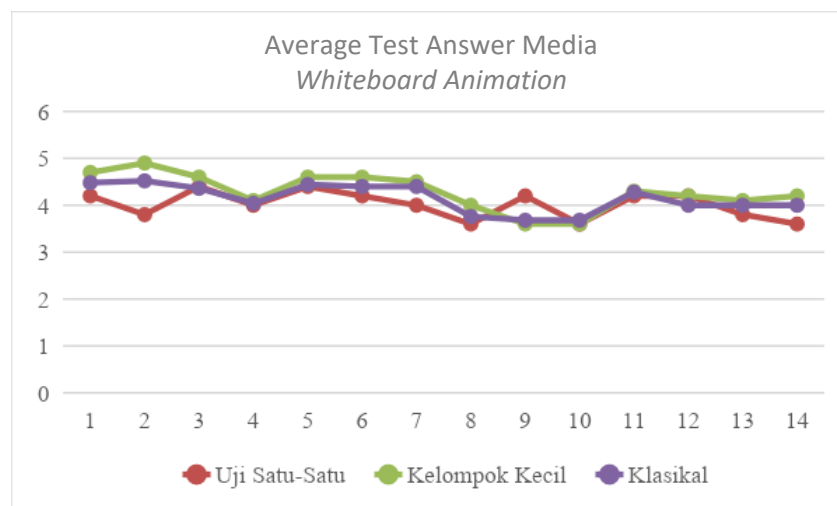

Figure 1.

Results

Table 2 shows the average learning outcomes through tutorials with Whiteboard Animation media.

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Table 2
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Test Control	19	36	78	55.95	10.916
Post-Test Control	19	59	96	72.63	8.908
Pre-Test Experiment	23	30	63	50.96	7.951
Post-Test Experiment	23	54	99	88.52	10.162
Valid N (listwise)	19				

The significance value of the t-test of 0.000 indicates a difference in ability between the experimental class and the control class. The average value of the experimental class post-test (88.52), which is greater than the control class (72.63), shows the influence of the application of multimedia with the Whiteboard Animation technique in developing students' ability to carry out and prepare class action research reports. The standard deviation of the experimental class (10.162), which is greater than the control class (8.908), shows that the range of the quality of the implementation and reporting of the CAR of the experimental class is higher than the control class.

Normality test of ≥ 0.05 shows that the distribution of the ability of the experimental and control classes is normal. Homogeneity test with a significance level ≥ 0.05 of 0.576 shows the variant ability of the experimental class and the control class is the same or homogeneous.

The range of values between pre-test and post-test for the experimental class is 37.56 (from 50.96 to 88.52), while for the control class, it is 16.68 (from 55.95 to 72.63). Increased ability to develop CAR in the tutorial class with Whiteboard Animation media is higher than in conventional classes. Meanwhile, the t-test obtained a t value of -13.962. The value of t table with a significant level of 5% is 2.037. Because t arithmetic > t table (-13.962 > 1.68195) and the significance value is less than 0.05 (0.00 < 0.05), it can be concluded that there is a significant increase in the students ability to develop CAR in tutorials with Whiteboard Animation media.

Table 3
Average Independent Sample T-tests

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-Test Experiment (Whiteboard Animation)	50.96	23	7.951	1.658
	Post-Test Experiment (Whiteboard Animation)	88.52	23	10.162	2.119
Pair 2	Pre-Test Control (Conventional)	55.95	19	10.916	2.504
	Post-Test Control(Conventional)	72.63	19	8.908	2.044

Whiteboard Animation media allows tutors to reveal all the steps of implementing CAR in one view in the form of a concept map and describe the step-by-step implementation of CAR in a short video flow. The concept map display presents the CAR cycle as a whole. Through the concept map, students have an overview of the steps that must be taken to carry out CAR.

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The intended experience in this research is for the students' to practice directly in teaching a class. They compared it by using learning media and without using learning media. Then, the learning improvement outcome is observed. A visualisation of the CAR process by a student is directed by a tutor to be an example of CAR implementation with all its advantages and disadvantages. Discussion of the advantages and disadvantages of the visualised CAR series is directed to be a classic reflection arena for each student to improve their performance in the next learning step. In general, the process of designing animation media is carried out by a tutor outside the meeting, when the meeting of the students who are appointed presents it can add to the implementation details experienced during the implementation of the CAR. The experience of failure and success during the learning process becomes valuable input for other students to improve in the next learning process. The interviews indicated that largely students were happy participating in the tutorials offered with the whiteboard animation.

Conclusion

Video Scribe White Animation that has been designed by the tutor and added to the student's detailed information during the tutorial process is proven to be able to improve the students' ability to conduct CAR step-by-step. The experiences in the classrooms of each presenter becomes a valuable input to their learning experience. Positive experiences serves as recommended suggestions, while negative experiences serves as identification of potential weakness that can be avoided. This study proves that the development of tutorial media based on Video Scribe Whiteboard Animation positively affect the student's ability to design CAR.

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