Interactive Multimedia Based On Computer Assisted Instruction: Development Efforts on the Learning Interest and Effectiveness in the History Learning

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Abstract

This study aims to analyze the effectiveness of interactive multimedia based on Computer Assisted Instruction (CAI) on the learning interest and effectiveness in the History learning. It is kind of development research. It involved 92 high school students of class X in Jember Regency as the subject of the study. The effectiveness test of CAI-based interactive multimedia through the expert tests showed good quality with the following criteria (1) material validation 91.5% (very good), 81% language validation (good), media validation and learning design 91.2% (very good). Small group tests and large group tests were conducted to obtain data of the product effectiveness on the learning interest in the history learning. Based on the paired sample T-test, it showed that there were significant differences before and after the use of product on small group and large group tests. Furthermore, the results of the effectiveness research through the T-test also showed that there were significant differences between the pre and post test. Thus, it could be concluded that the products developed had high effectiveness to increase the learning interest and learning outcomes.

Keywords — *interactive multimedia, Computer Assisted Instruction (CAI), learning interest and effectiveness*

I. RESEARCH BACKGROUND

Quality educators are educators who have pedagogical competence. One of the competencies in pedagogic is having the ability to use technology in the learning process which is used to motivate students, develop their critical thinking skills and problem solving with the stimuli provided by educators [1]. The use of technology is a way which can be done by educators to make the learning process more innovative and it also can encourage students to learn optimally. The use of instructional media in an integrated manner in the teaching and learning process can help support classroom learning because the function of the media in these activities is not only being a stimulus presenter in providing information and attitudes, but also to increase harmony in receiving information and providing feedback. According to Heinich, et. al [3], media is a channel of communication between the sender of the message and the receiver of the message.

Based on the observation results from the observations conducted on the educators in several high schools in Jember regency, it is known that 60% of media use has not been carried out optimally. It is because the educators still use the conventional learning paradigm without using teaching aids or learning media. Furthermore, the information obtained from the interview results stated that the schools only provide the educators with material books in the form of worksheets, textbooks and other printed teaching materials. The lack of the learning media use causes the educators being the only source of information which make the students become saturated and passive in the classroom.

The problems facing in the History learning process according to Hamid [2] are: (1) the skills and learning motivation of students who are still low; (2) limited learning resources for students; and (3) the learning atmosphere which is too monotonous in class. Those problems can be overcome by highlighting the existence of learning media to attract students' interest and motivation, adding learning resources, and creating a pleasant learning atmosphere in the classroom. In addition, Lumpki & Multon [4] stated that educators are expected to be able to use effective learning methods in the learning process in order to meet the students' needs in the era of globalization which continues to grow.

The use of interactive learning media can attract students' interest so it can improve the students' quality in the History learning. One effective medium which can be used is interactive multimedia based on Computer Assisted Instruction (CAI). It is a learning program packaged in the form of computer software. Interactive multimedia aims to simplify and clarify the presentation of messages so that they are not too verbalistic. It can also overcome the limitations of time, space and sensory power of students. Additionally, it can be appropriately used in various ways [12]

CAI-based interactive multimedia allows students to learn independently (mastery learning)

according to their own abilities. Computer Assisted Instruction is an interactive learning that uses computers to provide the learning material. Moreover, the students also can choose the additional learning materials based on their interest by using it [6]. Interactive multimedia based on Computer Assisted Instruction is expected to be an alternative learning for students to learn the history by minimizing the History material that exposes dry facts and memorization which is possible for them to reconstruct the events like whar have occurred to the ones who learn through convergent interactive media.

II. METHODE

The population in this study was 92 high school students in Jember Regency by taking 3 schools as samples. They were SMAN 1 Arjasa, SMAN 2 Tanggul, and SMAN 5 Jember. The selection of those samples was based on a linear (homogeneous) test conducted at an early stage by the researcher. Data collection techniques used were observations, interviews, questionnaires and documentation using qualitative and quantitative data analysis. Qualitative analysis using descriptive statistics was obtained from the results of interviews, observations, questionnaires, experts' advices, and documentation. Quantitative analysis using inference statistics in this study was obtained from questionnaires and tests provided in the form of validation tests, user tests, small group tests and large group tests. The analysis of learning interest and effectiveness were carried out at the user test stage (small group test) and field test (large group test) using T-test and using Paired Sample T-Test. The analysis of learning interest used questionnaire instruments. Meanwhile, the effectiveness of the use of CAI-based interactive multimedia can be seen from the learning outcomes of the students obtained from mean score of pre-test and post-test.

This study is included into development research using a quasi-experimental method. The development model used is the ASSURE model with 6 stages. They are (1) Analyze Learner Characteristic, (2) State Performance Objective, (3) Select Methods, Media, And Materials, (4) Utilize Materials, (5) Require Learner Participation, and (6) Evaluate and Revise [8].

The components of Analyze learner characteristics include (1) general characteristics including age, educational background, and socio-economic level background; (2) specific entry competencies containing behavior entry by assessing the attitude and target of each student; (3) learning style. The second stage is State performance objective which aims to determine the abilities expected by students after following the history learning process. The expected ability refers to the development of the material in the history learning in accordance with the 2013 character curriculum with basic competencies regarding the relationships of the early life of Indonesian people in the fields of belief, social, cultural, economic, and technological as well as their influence in today's life. The next stage is Select methods, media, and materials. Then, Utilize materials is as the review phase, include (1) material preview is done by producing the first draft of Computer Assisted Instruction-based interactive multimedia and tested by experts including content experts, language experts and learning media experts. Draft 2 multimedia is a draft revised by the experts which is then tested by users, they are the History educators and the students. User Test 1 consists of 3 educators, User Test 2 consists of 3 students, and User Test 3 consists of 10 students in each school used as research sites; (2) prepare the material for field test (large group) in class X IPS; (3) preparing the environment for the large group test stage; (4) prepare the learners by the educators by preparing classes to be more conducive and active in large group test.

The next stage Requires learner participation. At this stage, field tests or large group tests were carried out related to the development of CAI-based interactive multimedia products involving 30 students of class X IPS 2 of SMAN 1 Arjasa, 32 students of SMAN 2 Tanggul, and 30 students of SMAN 5 Jember. The last step is to evaluate and revise. This step is carried out to assess the effectiveness and the efficiency of previously designed learning media. The process of evaluating all components of the learning media is done to determine the feasibility of the media in the process of the history learning.

III. RESEARCH RESULTS AND DISCUSSION

It discusses the research results focusing on the data analysis results and the revision of CAI-based interactive multimedia development products, the explanation is as follow:

A. The Expert Validation of Computer Assisted Instruction (CAI)-Based Interactive Multimedia in the History Learning.

Based on the data analysis results of the questionnaire of the content expert validator in the field of study obtained a percentage of 91.5% which means that it has very good quality. The data analysis results of the questionnaire of the language validator obtained a percentage of 81% which means very well. The data analysis results of the questionnaire of the media validator and learning design obtained a percentage of 91.2% with very good qualifications.

User Test 1

The user test was divided into two phases. They were for the History educators as interactive multimedia users and the individual tests involving 3 students in each school. The homogeneity test was carried out at the significance level $\alpha = 0.05$.The

following will be the description of each user test. The user test 1 results involving three History educators in three schools showed that the overall scores given were very good with the criteria 1) SMAN 1 Arjasa obtained 91.1%; 2) SMAN 2 Tanggul obtained 92.2% and 3) SMAN 5 Jember obtained 87.7%. The average score of the tests done by the educators in three schools was 90.3%.

User Test 2

User test 2 involved three students from three high schools (SMA) in Jember Regency. Some data and input were obtained regarding the product being developed based on the user test results. They included (1) writing errors; (2) grammatical errors; (3) description of the image and also (4) the smoothness of the program being developed.

B. Learning Interest Test of Small Groups Through the Use of Computer Assisted Instruction (CAI)-Based Interactive Multimedia in the History Learning

Learning interest is a tendency and high enthusiasm or a great desire for something in the learning process [9]. Interest can give strength and guidance in the learning process so it is one of the important factors in achieving learning success [10]. The students' learning interest can be seen from the learning process in the history learning with these indicators: (1) happy feeling, (2) involvement of students, (3) interest, (4) attention of students. Developed multimedia products were also tested to small groups or early products tests. The following are the results of a small group analysis.

TABLE I
The Results of Learning Interest on Small Group Tests

No	Variabel	Mean	N	Std. Deviation
1.	Learning Interest in 3 Schools of Small Group Before	44.23	30	3.00
2.	Learning Interest in 3 Schools of Small Group After	82.53	30	2.37

TABLE II
The Differences in Learning Interest of Small Group Before and After

Paired Samples Test								
	Paired Differences					T	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Interest of Small Group Before and After	-38,30	3,46	0,63	-39,60	-37,01	-60,53	29	0,000

The results of T-test on the learning interest in small groups of high schools in Jember revealed that there were significant differences before and after the use of CAI-based interactive multimedia products with a significance level of 0.00 <alpha 0.05. These findings are in line with the research results of Singnan [7] which stated that Interactive Multimedia based on Computer Assisted Instruction have an effective level of 81.78 / 80.80 in the learning process. It is higher than the predetermined criteria which is 80/80. Learning interest has increased by 20.34% after the development of Computer Assisted Instruction media. The results of this study are also in accordance with Mayer's [5] explanation that interactive multimedia can be used as a learning approach in the classroom so as to make student learning outcomes effective. Hence, it can be concluded that a research in small group tests through the use of interactive multimedia can stimulate students' interest in the history learning.

C. Learning Interest Test of Large Groups Through the Use of Computer Assisted Instruction (CAI)-Based Interactive Multimedia in the History Learning

T-test is used to determine the mean score and the significance of the learning interest differences of large group before and after the use of CAI-based interactive multimedia. Further explanation is as follow.

TABLE III
The Results of Learning Interest on Large Group Tests

No	Variabel	Mean	N	Std. Deviation
1.	Learning Interest in 3 Schools of Large Group Before	53.54	92	2.84
2.	Learning Interest in 3 Schools of Large Group After	81.94	92	3.43

TABLE IV
The Differences in Learning Interest of Large Group Before and After

Paired Samples Test								
	Paired Differences					T	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Learning Interest of Large Group Before and After	-28,40	4,31	0,45	-29,29	-27,51	-63,21	91	0,000

T-test results on learning interest of large groups tests in 3 high schools in Jember revealed that there were significant differences before and after the use of CAI-based interactive multimedia products with a significance level of 0.00 <alpha 0.05. These findings are in accordance with the statement of Syah [9] as stated before; Wijaya [13] that defined the learning interest as a tendency and high enthusiasm or a great desire for something in the learning process. Poakwah, et al [11] also conclude that interactive multimedia is effectively used in the learning process. It can be proven that the experimental class develops more interest in learning and confidence in participating in discussion compared to the control class. Thus, it can be concluded that interest has a function as a force that encourages students to learn. Another supporting factor is because students are directly involved in the learning process through the use of CAI-based interactive multimedia.

D. Small Group Test of Product Effectiveness on Learning Outcomes

The small group test in this study involved 10 students of class X IPS in three schools. The results of different tests (t-test) produced a significance level of 0.00 <alpha 0.05) which meant that there were significant differences. These results indicated that there were differences between the mean score of the large group test analyzed from the results of the pre test and post test. The relative effectiveness of the results of the pre-test and post-test were then analyzed which showed the percentage of 71.67%. It meant that it was included in the high effectiveness in the effectiveness test criteria table.

E. Large Group Test of Product Effectiveness on Learning Outcomes

The test was carried out through pre-test before product use and post-test after product use. The results of different tests (t-test) produced a significance level of 0.00 <alpha 0.05). The results of the pre-test and post-test were then analyzed for effectiveness which showed a percentage of 71.94% in the high category. An increased effectiveness further supports that CAI-based interactive multimedia is truly actively used in the history learning.

IV. CONCLUSION

Interactive multimedia based on Computer Assisted Instruction was developed by the researcher in accordance with the needs of students in the field based on the process of observation and needs analysis. The results of the needs analysis found that students did not have an optimal interest. Expert test results showed that this product has good validity. It was also measured through a test of effectiveness through trials of small groups and large groups that also produced high significance values.

ACKNOWLEDGMENT

The researcher would like to thank the Social Science Education Master Study Program of Faculty of Teacher Training and Education especially to Dr. Nurul Umamah, M.Pd and Rully Putri Nirmala Puji, S.Pd., M.Ed for their valuable time, guidance, and advice for the completion of this journal. The author also wants to express her gratitude to the history educators and the students of class X IPS 2016-2017 at SMAN 1 Arjasa, SMAN 5 Jember and SMAN 2 Tanggul for the opportunity given to develop and conduct the study of CAI-based interactive multimedia products.

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