Development Of Augmented Reality Magicbook Interactive Multimedia Based On Lessonsm Computer And Basic Network In South Lampung Regency Vocational School

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Abstract: *This study aims to: 1) Describe the conditions and potential of learning using magicbook, 2) products produced in the form of books and augmented reality applications, 3) Analyze the effectiveness of the AR magicbook, 4) Analyze the attractiveness of the AR magicbook. This study uses the research and development approach of Borg and Gall. The study was conducted at Ketapang 1 Vocational School, Sragi 1 Vocational School and Bakauheni Vocational High School 1 in South Lampung Regency. Data collection techniques with questionnaires and tests, then the data were analyzed quantitatively and qualitatively. Based on observation of research and development of teaching material products in three schools, it is very supportive and possible to develop an augmented reality magicbook, the results of the N-gain test for the effectiveness of the augmented reality magicbook on learning by 0.80 the attractiveness of the magicbook at a success rate of 82%. The magicbook product was able to increase the posttest mean value of the pretest value from the average 61.92 increased to 91.69 after being given the learning using an augmented reality magicbook or an increase of 29.77 or 30%. This value was a very significant value for the improvement of students' learning outcomes. when augmented reality magicbook based on interactive multimedia proved to be able to improve the learning outcomes of computer network installation material in class X SMK in district Lampung Selatan.*
Key Terms: *Magicbook Augmented Reality, based interactive multimedia, Computers and basic networks.*

I. Preliminary

The success of a learning process in schools is determined by students, educators and teaching materials. Learning is essentially a core interaction between educators and students in the interaction educators do teaching activities and students do learning activities the availability of teaching materials is a supporting means in helping students to understand the subject matter. The teaching and learning process in schools has learning targets that must be achieved through teaching materials based on the curriculum. The curriculum currently continues to experience development in accordance with the demands of the times. Teaching materials that are widely summarized in the curriculum must be adjusted to the time available on the effective day of the school year. But the material in the curriculum is more than the time available. While all subjects are required to be able to achieve the target achievement of teaching materials so that there is often ineffectiveness in the learning process.

Teaching materials in the era of technological advancement are needed in the learning process to create human qualities that do not only depend on verbal transfer of knowledge. Technological progress makes the world of education demanded to develop, then the learning tools in it include materials that must be developed. The benefits of activities in learning that are caused by advances in science and technology are so that students can search for themselves to achieve a deeper understanding, and can directly experience the learning process. Learning will lead to student oriented namely learning processes that are centered on students where students are more active in seeking information. Information technology that is developing at this time has begun to penetrate into the field of education, namely by using digital methods as a means of learning. However, the use of digital learning methods is still not significant because it requires supporting devices to support activities using the digital method.

Computer training and basic networks in the 2013 curriculum are combined subjects between computer assembly and network installation in the KTSP curriculum with the learning process carried out in semester one and two at level X of SMK. with this reality the burden of students is getting heavier to be able to absorb all the material because of the narrow time and the incorporation of two subjects into one. so that students feel that basic computer and network training is like a frightening specter because the eyes of this training requires a high

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level of understanding and mastery of understanding the characteristics of computer hardware and how to install basic computer networks.

Based on observations conducted by researchers in the field, it was found that teaching materials used by students in the form of student handbooks were very few in number or reference, while the quality of learning outcomes of students was influenced by the availability of quality teaching materials. , efficient and interesting to be a contrasting situation of effective learning goals effectively efficient into a boring learning situation and tedious learners this reality is a learning factor of learners to maximize critical and innovative attitudes in the learning process, because learning is only focused on one learning material

Based on the results of interviews with educators in South Lampung District Vocational Schools especially those who teach computer training and basic networks through the MGMP forum students who reach KKM tend to be low, ie the average of the three schools used as research is only 44% who have mastery learning while 56% on average, students have not been able to complete grades according to minimum completeness criteria. This is certainly an inhibiting factor for students to be able to carry out learning to the next material.

When researchers conducted observations, they also found data about the condition of computer labs in each school. According to the information the representative of infrastructure at the school has a network computer laboratory with an average number of computers in each school of 15 units. With the condition of the computer laboratory above, it is not balanced between the number of students with the existing tools so that to carry out the practicum they have to use the tools in turn.

With regard to the problems contained in the learning, then a learning media is needed as a supporting tool to achieve the learning objectives so that the learning process can adjust to the existing curriculum and technological development. In accordance with the definition of Educational technology (Definition and Terminology of AECT; 1) is a complex and integrated process that involves people, procedures, ideas, equipment, and organizations to analyze the problem of finding solutions, implementing, evaluating and managing problem solving involving all aspects of learning human. In educational technology, problem solving is manifested in learning resources that are designed and chosen for learning purposes.

Magicbook Augmented Reality was chosen because it has reasons besides being able to fulfill the development of science and technology, especially in the field of education, it can also be used as a learning mediaThe results of preliminary observations obtained by researchers through the 2017 South Lampung MGMP forum from three schools that will be used as the object of research for all teachers who teach Computer and Network Engineering no one has used teaching materials that contain elements of interactive multimedia based on Augmented Reality (AR) so participants students and educators alike need the teaching material as a stimulus in the learning process.

According to Thorndike in Karwono (2010: 50) that which is the basis of the occurrence of learning is the existence of an association or link between the senses (stimulus) and the impulse that appears to act (response) called connecting. Stimulus that occurs after a behavior occurs will affect subsequent behavior. Changes in behavior due to learning activities that can be observed, which occurs because of the stimulus and response relationship. Thorndike's learning theory is called connectionism because learning is the process of forming connections between stimulus and response. While according to Skinner in Budiningsih (2005: 24) that the concept of learning is the relationship between stimulus and response that occurs through interaction in the environment, which will then lead to changes in behavior.

In information processing theory, there are several teaching models that will encourage the development of knowledge within students. In terms of controlling stimulus, it is collecting and organizing data, realizing and solving problems, developing concepts so that they are able to use verbal and non-verbal symbols in their delivery. According to Oemar Hamalik (2011: 128-129) Information processing refers to ways or receiving stimuli information from the environment, organizing data, solving problems, finding concepts, and using verbal and non-verbal symbols. While Syaiful sagala (2012.74) information provided in the form of certain physical energy (light for written material, sound for speech material, pressure for touch, etc.) is received by receptors that are sensitive to signs in certain forms.

Utilization of Augmented Reality technology in learning has several advantages, namely having excellent potential and great benefits in the learning process. Augmented Reality has the potential to involve students in the learning process and help improve students' visualization skills. Augmented Reality technology allows users to interact with virtual and real-time applications and bring natural experiences for students. learners will have different perspectives and have their own imagination in understanding their lessons.

According to (Barbara B. Seels and Richey, 1994: 31) The area of educational technology is formulated based on five (5) arable fields for Educational Technology, namely: Design, Development, Utilization, Management, and Assessment. Every field of work includes several areas of theory and practice.

According to (Sadiman et al, 2005: 10) learning media is a means of communication used to convey messages or learning materials. Whereas according to (Miarso, 2005: 458) learning media is all things used to

channel messages and can stimulate students' thoughts, feelings, attention, and willingness so as to encourage deliberate, purposeful and controlled learning processes.

The use of media in learning can facilitate students in gaining learning experiences from something abstract to be more concrete. According to Edgar Dale, the level of experience in acquiring children's learning outcomes is classified from the most concrete things to the most abstract things. The most concrete level of experience is if students experience a real learning event, observe events directly, observe events through the media and finally students make observations through symbols (symbols).

the use of multimedia in learning can (1) clarify messages and facilitate learning, (2) save time, effort, and overcome space limitations, (3) increase motivation to learn, (4) more interesting, (5) allow students to learn independently, (6) messages received can last longer in memory, and (7) improve learning outcomes.

Magicbook Augmented Reality is a teaching material that contains elements of text or writing, images and augmented reality applications in the form of 2D images, audio and video, the augmented reality application is able to detect objects in the marker book so that books and applications become an integrated whole. According to Henze, Schinke, Boll (2011), there are various types of methods that can be used to recognize and detect objects, one of which is the markerless method of detecting points or patterns in markers. computer vision techniques for real object detection approach methods (Olsson and Akesson, 2009).

The ASSURE learning model was chosen to develop the modl augmented reality magicbook product chosen because it was suitable for use in the development of teaching materials for students. according to (Dewi Salma Prawiradilaga, 2007). The ASSURE learning model is very helpful in designing programs using various types of media. This model uses several steps, namely Analyze Learners, State Objectives, Select Methods, Media and Materials, Utilize Media and Materials, Require Learner Participation, and Evaluate and Revise.

Ministry of National Education (2008: 11) revealed "the development of teaching materials should pay attention to the following learning principles: (1) starting from the easy to understand the difficult, from the concrete to understanding the abstract; (2) repetition strengthens understanding; (3) positive feedback provides reinforcement for students' understanding; (4) high motivation is one of the determinants of learning success; (5) achieving goals; and (6) knowing the results achieved ".

II. Research Methods

In this study using research and development design R & D Borg and Gall (in Sugiyono, 2015: 35) to the seventh step, namely 1) Research and information collecting, 2) Planning, 3) Develop preliminary form of product, 4) Preliminary field and testing, 5) Main product revision, 6) Main field testing and 7) Final product. This is because of time constraints and other supporting factors.

The population is the whole subject of Arikunto's research (2010: 173). The population in this study were all students of class X Vocational School in South Lampung Regency. The total number of students was 199 people. The sample is a part or representative of the population that will be examined (Arikunto, 2010: 174). The samples taken in this study were class X, each school was taken randomly as many as 27 students so that the total sample was 81 students.

The sampling technique used in this study is cluster random sampling or group sampling technique, namely random sampling of classes or groups. This technique is done because considering that the population is in a homogeneous condition or each class has the same average ability. One-to-one test samples were taken as many as 3 students from each school as a sample. Whereas the small group test taking of 9 students and large groups was conducted by taking students with different classes randomly as many as 15 students from each school.

The experimental design used in the field test and the large group test and small group test was One-Group Pretest-Posttest Design, which consisted of an experimental group without any control group (Sugiyono, 2011: 74). This design compares the value of the pretest (test before using magicbook augmented reality) with the posttest value (test after using an augmented reality magicbook).

Data collection techniques in the study include several forms of data collection. These techniques are documentation, observation, questionnaire (questionnaire) and tests.Documentation and observation is used to determine the feasibility of learning. Research instruments are tools or facilities used in data collection so that the work is easier and the results are better, in the sense that they are more accurate, complete, and systematic so that they are easier to process (Arikunto, 2010: 203). Data collection in this study is using questionnaires (questionnaire) and formative tests.

According to Arikunto (2012: 42) a questionnaire (questionnaire) is a list of questions that must be filled by the person to be measured (respondents). With a questionnaire (questionnaire) aims to determine the state / data themselves, experience, knowledge of attitudes and opinions. Questionnaire is given to educators and students to obtain data needs analysis in the preliminary stage. Then the questionnaire was given to the expert team and limited group testing and field tests to evaluate the initial model developed.

The test is a series of questions or exercises and other tools used to measure skills, intelligence, abilities or talents possessed by individuals or groups (Arikunto, 2010: 193). This test is used to measure students' understanding in the cognitive domain of thematic learning. The tests used are formative tests in the form of multiple choice questions. This problem was used in this study for the pretest and posttest data collection. Pretest before participating in learning using hots based PBL learning models. Posttest after participating in learning by using the material of Augmented Reality magicbook based on interactive multimedia. Before the test was used first the item was analyzed for its validity and reliability.

III. Discussion

The preliminary products that have been developed are tested with experts through filling out questionnaires. Expert tests are carried out covering expert test material experts, design experts and media experts. . Percentage of expert validation assessment on product components, among others, the first assessment by 89% of design experts and in the second assessment after 98% improvement, 74% of the media expert's assessment on the first assessment and the second assessment got 80%. got a score of 95% and in the second assessment got a score of 98% of the overall assessment by experts 89%.

In the limited trial it was conducted in one - one and small group trials to obtain and find out the learning outcomes with the Augmented Reality magicbook. Test one - one research subject of class X students totaling 9 people. Whereas in the small group trial conducted with the subjects of class X students amounted to 27 people.

Learning outcomes are seen from the pretest and posttest scores, the values before and after using augmented Reality magicbook. In addition, this group test was conducted to see the suitability and ease of use of the Augmented Reality magicbook teaching materials to improve the learning outcomes of class X students after learning. The average pretest and posttest learning outcomes in one - on - one trials were 59.4 and 89.4 with a minimum score of 45 and 75. While the average pretest and posttest learning outcomes in the small group trials were 62.2 and 91.8 with a minimum score of 35 and 80 These values are presented in the form of bar charts as follows:
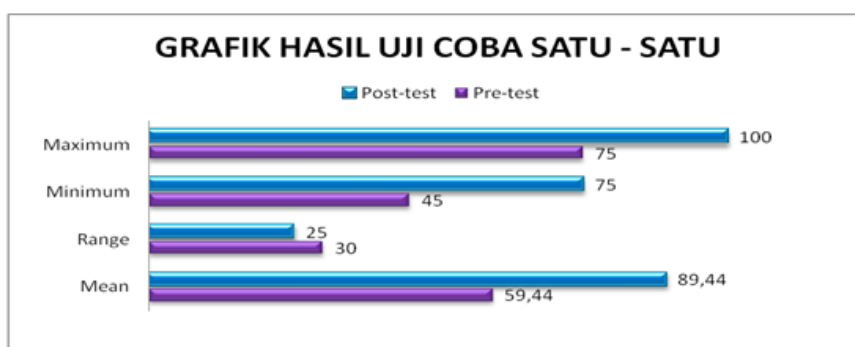

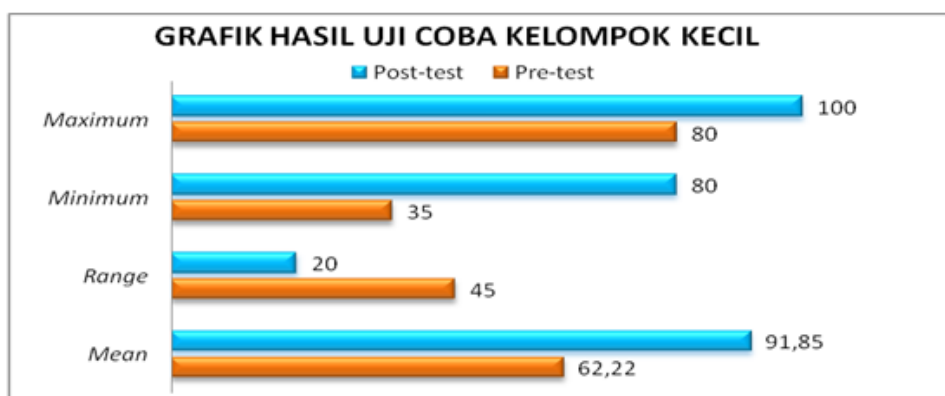Image 4.2 Grafik image of one-one trial bar

Image 4.3 Grafik image bar small group trial

Obtain and find out learning outcomes by using Augmented Reality magicbooks. Large group tests were conducted with class X research subjects with a total of 45 people. Learning outcomes are seen from the pretest and posttest values, namely the value before and after using Augmented Reality magicbook based on interactive multimedia. In addition, this group test was conducted to see the suitability and ease of the material for teaching an augmented Reality magicbook based on interactive multimedia to improve the learning outcomes of students in class X after participating in learning. The results of pretest and posttest learning on the large group test obtained an average value of pretest 64.11 and posttest mean value 93.78. These values are presented in the form of bar charts as follows:
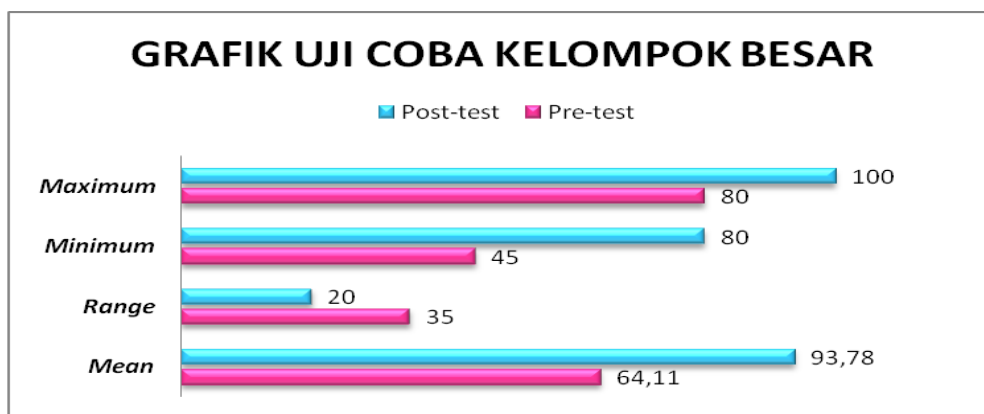

Image 4.4 Grafik image bar Large group trial

udents' learning outc g is said to be effective if (N-Gain) ≥ 0.70. N-Gain is obtained from the pretest and posttest values (data attached) in the limited one-to-one, small-group and large-group test. This value is calculated so that the N-Gain data obtained in the small group test is effective because $0.76 \geq 0.70$. N-Gain in the small group test was effective because $0.79 \geq 0.70$. N-Gain in the large group test is effective because $0.85 \geq 0.70$. Thus it can be concluded based on the calculation of the normalized N-Gain 0.80 average with high classification so that the use of augmented reality magicbook teaching materials in the South Lampung District Vocational School proved effective.

The achievement of the use of augmented reality magicbook teaching materials on basic computer and network learning in Kab. South Lampung by filling out a questionnaire, data taken from class X students. The data is presented in table form as follows:

Table 4.12 interest in using magicbook teaching materials

No.	sample	Persentase	Atractivieness classification	Classification level
1.	Trial One-One	80%	Interesting	Easy
2.	Small group trial	82%	Interesting	Easy
3.	Large group trial	83%	Interesting	Easy
	Average	82%	Interesting	Easy

cbook teaching proved to have

value is greater than the t table value. The hypothesis test results are the development of Magicbook Augmented Reality teaching materials based on interactive multimedia on the eyes of computer training and basic networks in SMK Lampung Selatan District in class X is an effective product , efficient and attractive in supporting the learning process so that students can achieve the competencies of the stated goals.

IV. Conclusion

The use of interactive multimedia-based augmented reality magicbook teaching materials on computer learning and basic networks in Lampung Seltan District Vocational High School proved effective with high qualifications, based on the calculation of the average N-Gain $0.80 \geq 0.70$. Efficiency with the calculation of learning time obtained a ratio value of 1.09 or saving 15 minutes from the time provided with high classification, so that $1.09 > 1$ (efficient). Interest is obtained by a percentage of 82% with an attractive classification.

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