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DEVELOPMENT OF COMPUTER ASSISTED INSTRUCTION (CAI) BASED TEACHING MATERIALS IN JUNIOR HIGH SCHOOL

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ABSTRACT

CAI-based teaching material is a material delivery system that incorporates multiple media learning. The interactive media is designed and programmed into a computerized system. Teaching materials in science that based on CAI system has been suggested to improve student's learning outcome. The purpose of this study is to produce a CAI-based interactive teaching material, to describe students' response after learning the CAI teaching materials, and to assess student's learning outcome. The CAI teaching materials were developed in 4D designs. This study was carried out in the state middle school (MTs Bustanul Ulum) Panti Jember. Subject of the study were students at the seventh (7th) grade. Data were collected in interviews, documentation, logic validation, questionnaire and test. Expert validation on instruments was at 3.77 categories. Score of student's learning outcome showed 76.5. The conclusion is a science teaching materials based on CAI can be used in junior high school.

Keywords: *Computer Assisted Instruction (CAI), Validation, Learning Outcom*

INTRODUCTION

Nowadays Information and Communication Technologies (ICT) are widely used in a variety of fields all over the world, As for instance in education, ICT in education really change the way of traditional learning to more effective learning. ICT has become an important tool for teaching and learning. It allows a more personalized learning in schools and greater flexibility (Garrison, D, 2011). Millennium newborn significant impact on research in the emerging digital home education students will encounter, we need to consider the cognitive skills of digital technology and the impact of learning expectations (Oludipe, 2011). Moreover, social values and lifestyles of the evolution of important issues All this will have an impact on education, we must take into account in the design of a new syllabus should

also be noted that the increasing use of information and communication technology will also affect the valuation techniques. Using ICT throughout the academic year and then providing end of year pen and paper tests are not a compatible exercise and will affect adversely the pupil performance. Therefore, the evaluation should also be mirrored, ICT in the classroom and how general education has been used (Joseph, S, 2007).

The use of information and communication technology as a teaching and learning aid must be integrated into virtually every subject curriculum (Hansen, 2004). With ICT innovative teaching and learning methods, which can be developed independently, the student center, they are actively involved in the learning process and encourage discovery and

learning experiences, problem solving skills, and so on (Ramest, 2013). At the same time develop the skills and efficiency aspects of digital, digital tools such as online collaboration, self-confident and critical use (Jeffdunn, 2013).

Not all students will have the opportunity at home or elsewhere, digital resources, there are several reasons. In some countries, the most advanced computer from home is almost 100%, but there are still some homes without. Some people do not have access to the Internet (or broadband), because of where they live or their socio-economic status. Schools should provide students with the opportunity to develop digital literacy (Damuri, YA, 2012).

The implementation of curriculum 2013 in schools should be done by ICT in secondary schools usually doubled, information and communication technology is used as a tool throughout the course depends on the device and access to resources, but also as an independent discipline in its own. It is like what in the regulation of ministry of national education Number 22 year 2006 about the standard content that the substance for science learning in junior high school based on ICT. According to Amy & Cherin (2003) science teacher will be able to give science knowledge to student in simple and suitable procedure if he/she masters science material well. Besides that, is teaching material based on ICT is very needed to be guidance for teacher and student. Thus, the implementation of science learning ibased on ICT in junior high school has strong legal basis.

Globalization demands education world always to adapt technology development to the improvement of education qualify, especially learning process. Teachers should be familiar with a variety of teaching methods, especially learning process. One of the important thing in

learning process is teaching material (Nesbit, J, 2014).

Teaching material is everything that is prepared and used by teacher to help to do learning process in the classroom (Prastowo, 2012:16). One of them through developing computer based teaching material that utilizes computer flexibility to solve the problems. The instruction uses computer is known with learning concept with computer assist or known well as CAI (Computer Assisted Instruction). CAI concept has function as learning material presenter, learning material depositor, still gives learning evaluation analysis (Musfiqon, 2012:190).

CAI is expected can help learning process to get satisfy learning outcome. Science teaching material based on CAI is teaching material development product that has been arranged by researcher based on student's need, so it can be reached learning objective what is desired.

Based on the background, the objectives of this research are to produce interactive teaching material based on valid CAI and to describe student's learning outcome after using teaching material based on CAI in state middle school (MTs Bustanul Ulum) Panti Jember.

METHOD OF RESEARCH

This research is research and development. The research subject is students at the seventh (7th) grade in state middle school (MTs Bustanul Ulum) Panti Jember. Technic of determining sample from this research uses purposive sampling through analyzing the student. Purposive sampling is sample determining technic with consideration so that it is worthy to be sample. This consideration is done on analyzing student step in phase definition, in model has been explained about student characteristics appropriate with

planning and development of teaching material (Hobri,2010:12).

Teaching material based on CAI design in this research uses 4-D developed by Thiagarajan, then modified by researcher become : 1) definition; 2) planning; and 3) development. In this research, the development is limited to development step.

The instrument of acquisition data is tool uses to get data that will be analyzed so that the researcher can know that developed teaching material has valid or not valid category. The instrument used in this research is teaching material validity sheet based on CAI, questionnaire response sheet and test.

Teaching material validity is examined by validator so that it can produce valid product that can be used for development test. Student's learning outcome is student mastery of learning outcome got from the result of total score average on cognitive, affektive and psychomotor domain. Where the category of student's learning outcome is from very low till very high (Trianto,2010:212).

RESULT AND DISCUSSION

The result of experts validity by two lecturers from University of Jember and one science teacher in state middle school (MTs Bustanul Ulum) Panti Jember, shows that teaching material based on CAI is classified on valid category. The result of assessment analysis from validator to CAI can be seen on Table 1.

Table 1. The Result of Logic Validity Analysis

Number	Validator	Score Percentage	Score	Category
1	Content	95	3,90	Worthy
2	Format	60	3,71	Worthy
3	Language	98	3,70	Worthy
Score of Validation			3,77	Worthy

Based on Table 1. is known that the assessment from experts from content side reviewed from broadness, depth, and true concept got average score 3.90. This score is got from validity score average, where validity total score gets 95 then divided total statement aspect 25, then multiplied 100%, so the teaching material from the content side gets score 3.90. While from on format side is 3.71 and from language side is 3.70. Teaching material is worthy if the score above or equal to 2.06 and not worthy if gets score below or equal to 2.05 (BSNP, 2008). Thus it can be concluded that teaching material based on CAI that is developed by researcher has worthy criteria to be used in learning process. On this step also get suggestion from the experts.

The result of learning outcome data analysis from three domains i.e. cognitive, affective and psychomotor that has been analyzed using learning outcome formula can be seen on Table 2.

Table 2. The Result Data of Student's Learning Outcome

Number	Domain	Score Percentage	Category
1	Cognitive	78.5	High
2	Affective	77.5	High
3	Psychomotor	71.5	Moderate
HB Classical Score of Student		76.5	High

Analysis of student's learning outcome is got from analyzing data of cognitive, affective and psychomotor domain. Cognitive domain is got from *post-test* score where the student do exercise in the end of learning process using computer. Cognitive score average is got 76,5. It shows that student's cognitive learning outcome can be categorized high.

Affective score average is high category. Affective domain assessment is showed on learning activity score in the class begin with

pray, curiosity, thorough, responsibility and cooperation. In learning activity uses this teaching material the student is demanded to learn independent and more active.

Psychomotor consist of the student observe video instruction with teaching material based on CAI and collect the data from that observation. This domain gets moderate category. Psychomotor score result is categorized moderate because there was some troubles with some computers that had no function smoothly when video observation process, it influenced the process of student on observation till make conclusion.

CONCLUSION

Based on the result of research and discussion, it can be concluded that teaching material based on CAI that is developed it has been worthy used on instruction in junior high school because it gets score 3.90, 3.71, and 3.70 from experts validity result. Besides that teaching material based on CAI that is developed also can increase student's learning outcome. It can be seen that cognitive score average is 78.5 on high category, affective score average is 77.5 on high category, and psychomotor score average is 71.5 on moderate category. Teaching material based on CAI can be solution to increase student's learning outcome. Besides that, the teacher is expected to be able to make teaching material by his/herself to increase student's learning outcome in different chapter.

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