

Interactive Compact Disc Media Development For Geometry Topics For Class VIII Junior High School Student

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Abstract : Junior High School student mathematics learning result is still very low. This is due to students are less motivated and less interested in learning mathematics. To tackle this problem, one of efforts teacher can do is to develop a valid, practical, and effective mathematics learning interactive Compact Disc (CD). This is a development research with a 4-D development model which consists of four main steps, namely, define, design, develop, and disseminate. Preliminary research is to analyze the curriculum as well as to analyze the concept related to geometry learning material. The assessment phase is to conduct limited practicality test and to conduct limited effectiveness tests. The practicality data are obtained from teacher questionnaire practicality, and student questionnaire practicality. The research result revealed that the developed mathematics learning device is valid and practical.

Key words: Interactive CD Media, Geometry.

1 INTRODUCTION

Mathematics is a discipline with a vital important role in the development of science. Mathematics is able to educate human beings to think logically, critically, systematically, thoroughly, effectively, and is able to help human to develop creativity. In its learning, mathematics has interrelated concepts to one another, this is due to in order to be able to master a new concept in mathematics, students need to first understand the other concepts related to the learning material. In addition, mathematics cannot be separated from other real life problems. Talking about students, it means that we talk about human being with various characteristics and experiences. Human obtains experience throughout many different levels, namely, the words, the replacement of the real life experience by investigating past events and real life experience (Usman and Asmawir, 2002). Real life experience is very effective in learning activity since it includes all human senses. The more senses are stimulated the more information will be obtained, so that the purpose of the communication can be achieved.. Characteristics and experiences level differences require teachers to be creative in delivering the learning material. One of the teacher creativities on learning is in the making and the using of learning media. Media is the most prominent aspect as an intermediary for communication in learning. The limitation of learning media or tool, in education often influences students' achievement. Ebbinghaus, a psychologist, revealed that learning material can stay longer in students' memory due to appropriate learning media since it has a strong stimulating (Irsyad, 2008). The selection of appropriate media is very important in the knowledge transfer.

The created media need to activate all students' potential in the form of hearing, vision, and ability. In fact, student retention is heavily influenced by learning activity model conducted by the teacher. Students can only absorb 5% of learning material in the teacher lecturing type classroom or teacher center classroom type. In comparison to peer learning activity has resulted in 90% student retention

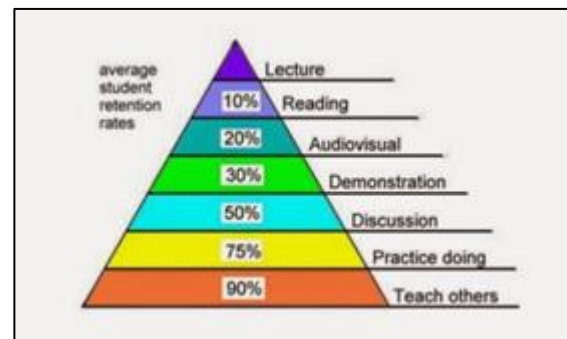


Figure 1. Learning Pyramid by Eyer and Giles

Eyer and Giles research revealed that learning effectiveness is influenced by learning media used by teachers (Wena, 2008). They found out that the learning model in the very top position of the pyramid is learning which merely includes verbal symbol is the learning which produces the highest abstraction level. The most effective learning is at the bottom part of the pyramid, in which it is direct involvement in the purposeful learning experience. The abstraction level at this stage is very low, so that it allows the student to absorb new knowledge and experience. Multimedia is one of media to activate students' potential in learning. Therefore, the use of multimedia is expected to enable learning result improvement. Moreover, as the effective learning media, multimedia is being used due to its strong appearance in attracting student attention. Learning media is one of the learning resources which can distribute message or learning material to the student. Today media is in great variety, ranging from conventional media such as book and traditional props to a more modern audio visual medium. Learning CD is one of the media with a large variety, namely, game, questions, and

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learning material (Ibnu F, 2015). Learning conducted in Public Junior High School (SMP N) 22 Padang still based its learning on text book explained by the teacher in front of the classroom as the students are listening to it, taking notes, and doing the exercise as instructed by the teacher. In this kind of learning, the teacher plays a dominant role right from the very beginning to the end. This has caused the students to be physically as well as mentally less involved in the learning process. Before the learning begun, only small numbers of students read the textbook at home, most of them are not reviewing the previous learning material. Students are less interested in reading. This is one of disadvantages of recent learning media. In fact, it is known that one of the students' supporting keys or education quality itself is through reading. Students are expected for teacher explanation rather than read the learning material by themselves. Learning material visualization is the disadvantage of recent learning material. Although the teacher has provided manual description on the board, still it is not sufficient to address all students' problem. This will influence the students' learning result as well as the quality of the education itself. Based on the survey result conducted by the researcher in SMP N 22 Padang, it is obtained that students' learning result is still very low. The Minimum Completeness Criteria (KKM) = 80 is hard for the students to attain. Of the total 31 students of class VIII₃ for the first day test, there are only 5 students who are succeeding or obtaining ≥ 80 score, and on the second daily test, there are only 6 students who are succeeding or obtaining more than ≥ 80 scores. Computer media can be used as a motor to make it possible for the previously impossible in the learning implementation. A qualified learning media can be resulted from a well designed computer program (Febi R, 2013). Appropriate learning media will have a big influence in achieving competence/learning purpose that will be achieved by the teacher during teaching and learning process (Wena, 2008). One of the ways to reach Education quality improvement and knowledge improvement is by implementing an interactive CD learning method (Transfield, E., M., S., et al. 2012). Interactive CD has a large variety, namely, game, questions and teaching material (Prastowo, 2011). Media play a vital important role in teaching and learning in order to improve students' learning result. This can be seen from one research about the use of media in the teaching and learning process. The research result of Morrison, Ross, and O' Dell revealed that computer based learning model is more effective compared to traditional learning method. By using computer based learning method, students will find it easier to control their learning, selecting their learning sequence, making it easier for the students to make the learning task, and conducting self evaluation (Wena, 2008). As the learning media, computer has a high effective since it can combine and present the text, graphic, audio, video and animation by combining the link and tool to allow users to navigate, interact, create, and communicate at the same place and time (Firdaus, 2012). The use of computer based learning material has a significant impact on students' interest in learning the targeted competence (Ali M, 2009). In this kind of learning activity, it is expected that students will be able to learn independently by using interactive CD learning media run by computer. Abstract concepts in mathematics are expected to be comprehended by students once they are using Interactive CD learning media. The use of this Interactive CD learning media can help teacher to change abstract concepts into concrete ones,

throughout video and animation, so that they can help to improve students' activity and learning result.

2 MATERIAL AND METHOD

This research employs a 4-D development model. This research is to develop a product in the form of interactive CD which is valid, practical, and effective. This 4-D development model consists of four main phases, namely, define, design, develop, and disseminate. This research is limited to the third phase, development phase, considering research limitation. The define phase has three basic steps, namely, need analysis, student analysis, and task analysis. The design phase is to prepare the prototype of interactive CD learning media. The development phase is to produce revised interactive CD learning media based on the expert's recommendation. This phase includes validation of interactive DC media by the experts followed by its revision, practicality for both teacher and student. The result obtained in this phase is continued to the activity assessment by assessing practicality and effectiveness of the developed learning device.

3 RESULT AND DISCUSSION

There are many analysis activities on the preliminary research aimed to reveal problems occurred in the learning and to reveal the needs in developing learning material for class VIII Junior High School students.

3.1 Teacher Interview Result

Teacher interview is conducted informally in order to get learning media as expected and easy to use. The interview result revealed that in the field, it is still a one way learning where most of the students are passive and the teacher tends to be the prominent one in the learning process. Less interested and less motivated students are one of the problems encounter by teachers in the classroom. Students' negligence toward the learning subject has caused the teacher to experience difficulties in explaining learning material. Students' concentration level in the classroom is very low; hence most of them are not listening to teacher explanation and most of them are doing other than learning activity. Students do not understand that education is important in building their characteristics. They tend to think that learning is a compulsion. Inappropriate living environment also influences students' attitude in the classroom learning. Friendship also contributes negative impact on students' mindset. Finally, students tend to consider that learning at school and listening to teacher explanation in the classroom as boring activities. Therefore, interactive learning media development was designed to attract students to get interested and motivated in learning mathematics. It is expected that students are not only waiting for their teacher explanation, but to learn independently by themselves to find the concept. Interactive learning media is designed to arouse students' curiosity and students' interest in learning mathematics. The interesting and attractive layout, figures, and color on learning media are expected to be able to improve students' interest and motivation to learn mathematics.

3.2 Student characteristics Analysis

Piaget revealed that class VIII students of Junior High School aged between 12 to 14 years old are at the last stage of concrete operational stage, where the tendency has three

characteristics, namely, concrete, integrative, and hierarchy. Concrete means that the learning process starts from concrete things that can be seen, heard, touched, and rearranged by emphasizing the use of living environment as learning resources. To accommodate students' need, learning media, which can transfer abstract into a real thing, more figures, and colorful is of vital importance. The appropriate media are computer based learning which has the ability to reduce the abstract of the objects particularly on geometry learning subjects.

3.3 The result of syllabus analysis and class VII of Junior High School mathematics learning book analysis

According to mathematics learning syllabus of junior high school/Islamic junior high school of class VIII curriculum 2013, the main competence of flat side geometry is to respect and to appreciate individual's belief, to respect and to appreciate honesty, discipline, responsibility, care (tolerant, mutual cooperation), polite, self confidence in interacting effectively in the social environment and in the association as well as the existence, understand and implement technology and science (factual, conceptual, and procedural) based on curiosity about science and technology, cultural art in relation with real life phenomenon and event. The next step after analyzing mathematics curriculum of Junior High School/Islamic Junior High School (SMP/MTs) is to analyze mathematics learning syllabus of class VIII of SMP/MTs. The syllabus analysis of class VIII SMP/MTs aimed to see whether the learning material is in line with the expected competence. Based on the existed syllabus obtained by the researcher from mathematics teacher of class VIII, then the learning material that will be learned by the students are analyzed, including the achievement indicators learned by the students of class VIII SMP/MTs. The analysis result of learning material, syllabus revealed that it is of vital importance to use learning material that can transfer an abstract mathematical concepts into the real one, so that the students can understand the learning material easily

3.4 Analysis Result of Flat Side Geometry Material

The analysis of geometry learning material of class VIII is aimed to identify and to arrange the existed concepts of geometry learning material to allow each page arrangement in the interactive learning media. This analysis is conducted based on the result of syllabus analysis and mathematics learning book of class VIII SMP analysis that have conducted previously. The geometry learning material consists of 3 main subjects, (1) elements on flat side geometry, (2) volume of flat side geometry, (3) the wide surface of flat side geometry. Geometry in class VIII focuses on 4 kinds of geometry, namely, cube, bar, pyramid, and prism. In order to be able to well comprehend geometry learning material, students will first need to know the elements of geometry. After comprehending the elements of geometry, the next learning will be about volume and the wide surface of geometry.

3.5 The Result of Literature Review on Computer Based Learning Media

Literature analysis is conducted with obtained information related to the material as well as the making of interactive computer based on geometry mathematics learning material. In the learning material, the literature being used is educational book, mathematics learning syllabus, and learning

book of class VIII SMP. In the making of learning media, most of its resources are books about computer based learning media.

3.6 The Result of Developing Media

The result of media implementation after several corrections done based on suggestions and comments from the experts. That can be seen in the below pictures.



Figure 2. Implementation of the login page (cover)



Figure 3. Implementation of main menu page (home)



Figure 4. Implementation of volume material cube

3.7 The Result Of Validation And Practicality Media

After the media have been made then the media are tested for validation and practicality. The media are validated by four validates with three aspects: media, material, and language. The result the validation can be seen from table 1.

Tabel 1. The result of media validation

No	Aspects	Average	Category
1	Content	3.5	Very valid
2	Presentation	3.4	Valid
3	Language	3.6	Very valid
4	Graphic	3.5	Very valid
Average		3.5	Very valid

The result of the validation of the media from table 1 shows that the interactive media on geometry subject have the very valid category, this term can be seen from the percentage is 3.5. It draws that the learning media is suitable as the interactive media of Geometric subject. The results of the practicality of interactive media are obtained from the inquiries

of teachers and students. The practicality sheets are arranged based on the ease of use, time efficiency and benefit.

Table 2. Practical Media by teachers

NO	Aspects	Average	Category
1	Ease of use	3.8	Very practical
2	Time Efficiency	3.5	Very practical
3	Benefits	3.6	Very practical
Average		3.6	Very practical

Table 3. Practical Media by Students

NO	Aspects	Average	Category
1	Ease of use	3.61	Very practical
2	Time Efficiency	3.52	Very practical
3	Benefits	3.56	Very practical
Average		3.56	Very practical

Referring to table 2, and 3 shows that the interactive media practicality values are very practical. It can be seen from the average scores are 3.6 and 3.56. The results of the media practicality show that the interactive learning media is very practical as the interactive media on geometry subject.

4 CONCLUSION

Based on discussion of development of interactive CD media, it can be concluded that the interactive CD media is already a valid value and high practicality.

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