DEVELOPMENT OF MATHEMATICS LEARNING AIDS USING PROBLEM POSING MODEL-BASED CHARACTER EDUCATION WITH CD-ASSISTED LEARNING FROM THE PERSPECTIVE CRITICAL THINKING SKILLS OF SMP STUDENTS

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ABSTRACTS

This research aims to produce a valid learning tool development and implementation of field trials using Problem Posing using model-based character education CD-assisted learning in terms of critical thinking skills of learners SMP. This study is an R & D (research and development). Outcomes of this research is the products with the learning device consisting of a syllabus, lesson plans, CD Learning, and Student Worksheet. The results of the validation experts claim all devices developed well and can be used with an average score of 3.70 on the highest score 4. Results of field trials of mathematics learning with learning model Character Education Based Problem Posing Assisted Learning CD Seen From Critical Thinking Ability of Students of SMP the quadrilateral material class VII produce effective learning based on (1) the average value of the experimental class students achieve more than KKM is 81.79 so thoroughly in the classical experimental class. (2) the results of student learning achievement experimental class better than the control class. Values obtained 81.79 to 65.88 for the experimental class and the control class. Based on the results of a valid and effective learning mentioned above, the development of learning tools achieve the desired results.

Keywords: *research and development, problem posing, character education, critical thinking*

Introduction

In the era of globalization is accompanied by the rapid development of science and technology, education faces with the challenge to produce the human resources which can meet global demands. Because education is an activity that seeks to build communities and sustainable national character that foster mental, ratios, intellectual and personality in order to form a complete human beings. Every human being has the potential and talent in him. The task of true education is to help students to discover and develop optimally. Therefore education should receive attention, intensive handling and priorities of government, community and education managers.

Many opinions revealed that learning mathematics is not an emphasis on developing the power of reason, logic and the thinking of students. It was appropriate that expressed by (Siswono, 2009), namely "Teaching math is generally dominated by the introduction of formulas and concepts verbally, without enough attention to the students 'understanding'.

Also according to (Siswono, 2009), which took place during this teaching, mechanistic where students simply emulate exactly what was done and said by the teacher without any initiative from within itself. Students are not given the freedom and encouragement to optimize his potential, develop reasoning and creativity. Learning mathematics is considered simply emphasizing cognitive factors, whereas personality development as part of life skills and character education is the task of all subjects in school. Such distance learning student of human nature and character cannot be formed.

Herdian, (2009) explains that the problem posing a "learning model that requires learners prepare their own question or break a problem into questions which are simpler and refer to the settlement of the matter". In mathematics, the submission of a matter (problem posing) occupies a strategic position. This is according to a statement (Herdian, 2009) that learners must master the material and problem-solving sequence in detail. This will be achieved if learners are able to increase their knowledge not only of teachers, but also trying to find themselves and learn independently.

Involvement of learners to participate in learning by applying the learning model problem posing is one indicator of the effectiveness and creativity demanding learning. Creativity will appear when learners are given the freedom to think and create, so when the creativity of learners appears it will form social personality as a form of character education. According Herdian cited by (Rahmawati, 2012) Learners do not just accept any materials from the teacher, but the students also tried to explore and develop their own knowledge. Learning outcomes are not only resulted in an increase in knowledge but also improve thinking skills. These capabilities will be clearly visible when the learner is able to submit questions independently or in groups. With the application of learning models posing problems to train the students to learn creative, discipline, and enhance the critical thinking skills of learners.

Character education is a system of cultivation of character values to the school community, which includes knowledge, awareness or willpower, and actions to implement these values (Aqib, et al, 2011: 3). Framework for the development of the character and culture of the nation through the learning process is essential. The educators expected to instill character values such as independence, responsibility, and proficient in the lives of the learners. In addition, the character is also necessary for an educator because through this, educators will have more creative work orientation.

Material Flat figure is part of the geometry that emphasizes the ability of learners to identify the nature, the elements and determine the circumference and area in solving related

(Destika, 2008). However, students are less interested in the mathematics learning process, especially on waking flat material. Learners saturated with learning less interesting and less teachers provide opportunities for students to actively and creatively manipulate objects directly, so that most of the learners is difficult to understand each concept being taught. It is less to stimulate the imagination and creativity of learners. In addition, the use of facilities such as LCD media has not been used optimally. Therefore, we need a model and media that can support the delivery of this material. The model used is the problem posing based on character education, whereas CD media used are learning to help students understand the concepts being taught and able to cope the diversity, learning pace and learning styles of learners. Based on the above, this research will develop a mathematics learning software development with Problem Posing learning model based character education CD-assisted learning in terms of critical thinking skills of junior high school learners.

Based on the above background, this study will develop a set of learning mathematics by posing problem-based learning model character education CD-assisted learning in terms of critical thinking ability of junior high school students. To that end we propose some issues that are the focus of research, namely (1) How does the development of mathematics learning software learning model-based problem posing character education CD-assisted learning in terms of critical thinking skills junior high school students were valid? (2) How is the effectiveness of the study of mathematics by posing problem-based learning model character education CD-assisted learning in terms of junior high school students' critical thinking skills?

The purpose of this study is to describe the preparation of the study of mathematics by posing problem-based learning model character education CD-assisted learning in terms of critical thinking skills junior high school students were valid. As for the steps taken are: (1) defining stage by observing the learning of mathematics that has been prepared by the teacher and then design the existing software development based on the Regulation of the Minister of Education and Culture No. 68 Year 2013 concerning the Framework Elementary and Junior High School Curriculum Structure / MTs, (2) the development stage through testing the validity of the device based on the testimony of experts and testing devices in the learning process through a limited trial.

To realize the theme of the National Education Day in 2014, as stated by Minister of National Education on the National Education Day in 2014 that conveys the importance of education as a social vaccine and elevators in public life, hence the need for an effort to

prepare well for the next generation. While the social perspective, there are three very large social problems that give negative impact: (i) poverty; (ii) ignorance; and (iii) underdevelopment civilized. How does to increase resistance (immunity) to avoid third social kinds of problems? The answer is education. Therefore, education can be a social vaccine. One effort that can be done is to develop learning tools that are already existed relevant to the theme of education.

This research has its peculiarities and virtues, among others: (1) study the products with the learning device consisting of a syllabus, lesson plans, students' worksheet, and CD Learning; (2) the resulting learning can facilitate learners to develop the capabilities of the overall so that it has a superior competitiveness, able to follow the development of science and technology, and has a character; (3) the resulting learning device capable of supporting the establishment of the National Education Day 2014 theme is Improving Quality and Access Human Resource (Ministry of National Education, 2014).

Method

This research includes R & D (research and development) or the type of research development. Development is done is the study of mathematics by posing problem-based learning model character education CD-assisted learning in terms of junior high school students' critical thinking skills. Developing devices are in the form of (1) Syllabus, (2) Learning Implementation Plan (RPP), (3) Student Worksheet (LKS), (4) CD Learning, and (5) Achievement Tests.

Variable research on software development research study of mathematics by posing problem-based learning model character education CD-assisted learning in terms of critical thinking skills junior high school students are (1) Independent variables (independent), in this research is learning model applied learning model is the model of learning problems posing with a character-based education group learning setting imposed in the experimental group and the conventional learning model imposed in the control group; (2) The dependent variable (dependent), this research is learning achievement.

To obtain a valid device, it was developed following the steps that exist in Thiagarajan theory of development. In accordance with the procedure 4D software development (Thiagarajan, 1974: 5-9), through the definition and planning phase will be obtained draft I. Later in the validation stage of development carried out by experts using a sheet of validation learning device, in order to obtain suggestions for revising the first draft

into a draft II (expert validated learning device). Furthermore, the limited trial to get input that will be used to revise the draft II became the third draft.

Effective learning is indicated by (a) the achievement of learning achieve a minimum completeness criteria either individually or in the classical style, (b) student achievement in mathematics by posing problem-based learning model character education CD-assisted learning is better than learning achievement of students who do not receive learning.

The experiment was conducted in the second semester of the seventh grade of Academic Year 2014/2015, SMP Negeri 37 Semarang consists of 8 classes. With cluster random sampling technique was selected as a class experiment VII B class and class VII D as the control class. Data were collected through testing, documentation and observation. Data analysis techniques in this study include (1) data analysis expert validation; (2) The initial data analysis (test of homogeneity and normality); (3) analysis of the effectiveness of learning (mastery learning and test comparative test).

Results and Discussion

Instrument Development Process Model 4D Thiagdarajan. Instrument development process of learning mathematics by posing problem-based learning model character education CD-assisted learning in terms of critical thinking ability of junior high school students. Starting from the definition phase. Learning tools are important components determining the success of students in learning the material. In Indonesia, the preparation of learning tools such as syllabi, lesson plans and assessment tools adapted to the rules contained in the Regulation of the Minister of Education and Culture No. 68 Year 2013 concerning the Framework Primary And Secondary School Curriculum Structure First / MTs.

Based on interviews with teachers, we obtained information that the quadrilateral material is still below the average. Many scores are still below the KKM. From the interviews, we obtained information that one of the problems faced by learners in the study material is that they tend to be rectangular memorize formulas so that the results are less than optimal. Besides learning still centered on the teacher makes them quickly bored and sleepy during the learning process. Therefore in this study, the material taken is rectangle. Rectangular material itself consists of waking rectangle, square, trapezoid, parallelogram, rhombus and a kite. For the properties of the rectangle can be constructed using the concept of lines and angles that have been previously owned learners. The formula spacious

rectangular square built using the concept of the unit and can then be used to derive the formula for the area in terms of four others. In addition the material presented is expected to improve learning achievement, motivation and critical thinking skills of learners.

After analyzing the definition phase, then at the design stage are arranged in the form of Syllabus learning device, Learning Implementation Plan (RPP), CD Learning, and Student Worksheet (LKS). To achieve good learning software design, then the Focus Group Discussion (FGD) with peer professors to maintain a scientific attitude and originality standpoint of the researchers who developed the device. Furthermore, the initial draft of this learning device called the draft I.

Preliminary design of the device later in the validation stage of development. Expert judgment includes validation of products, which includes all the learning tools developed at the design stage. Validation is done by two people who are competent to assess the feasibility of the learning device. Revisions were made based on advice or instructions from the validator. Based on the results from the validation expert, it obtained results to validate the learning device Syllabus, Learning Implementation Plan (RPP), CD Learning, and Student Worksheet (LKS) are designed well and can be used. Results of the revision are based on ratings of validator produced draft II.

Results of expert validation of the mathematics learning device obtained an average yield of total given by the validator is 3.70 of value maxsimal 4. Results of the revision are based on ratings of validator produced draft II that is ready to be implemented in a limited trial activity.

Results of Limited Trial

Results of limited trial was conducted to determine whether the device mathematics learning model-based problem posing character education CD-assisted learning in terms of junior high school students' critical thinking skills effective or not.

The emphasis is the application of learning with contextual approach and critical thinking let always consider the characteristics and student learning that is learning should involve mental processes of students, fun, encouraging activity of students, allowing students to construct their learning experiences so that learning becomes full significance, in this case the role of the teacher as a facilitator in the learning of the estuary towards the creation of an effective learning environment. This theory is used as a base or landing in the learning process and the learning and teaching of mathematics in this study.

Implementation of learning in SMPN 37 Semarang, students and teachers should respond to the study of mathematics by learning model based character education Problem Posing CD-assisted learning in terms of critical thinking skills of learners SMP included in either category. For completeness test showed that the average score of classical learning completeness in the experimental class is more than or equal to 70.

Based on the results of comparing the average score of the experimental class and control class can be concluded that the experimental class (81.79) has an average score of completeness is higher compared to the average score of the thoroughness of control class (65.88). It shows the mathematics learning with Problem Posing learning model based character education CD-assisted learning in terms of critical thinking skills of junior high school learners is better than the conventional method that has been done.

The success was due to the model of Problem Posing in class helps learners to improve engagement between learners (Hurt 2008: 1). In completing the task group, each member cooperates each other, respect among learners. Another thing that led to the successful learning because their model of Problem Posing is also supported by learning that can improve the ability of critical thinking mathematically.

Thus the development of mathematics learning with Problem Posing learning model based character education CD-assisted learning in terms of critical thinking skills of learners junior, has met two things: learning device are valid and effective learning. Effective learning can be seen from (a) meet the learning completeness (b) achievement of learners using the model of Problem Posing better than the achievement of learners using conventional learning.

Conclusions and Recommendations

The conclusions. Based on the software development process of learning by using a modified software development model 4-D has been done, it can be concluded (1) The process and the results of making mathematics learning software development with Problem Posing learning model based character education CD-assisted learning in terms of critical thinking skills of learners SMP valid. Because learning tools that have been developed through a validation process established by the expert or experts in their field; (2) The study of mathematics by learning model based character education Problem Posing CD-assisted learning in terms of critical thinking skills in the junior high school students of class VII quadrilateral material already performing well.

Implementation of learning in SMPN 37 Semarang, students and teachers of SMPN 37 Semarang provide a good response; (3) Learning mathematics with Problem Posing learning model based character education CD-assisted learning in terms of critical thinking skills in the junior high school students of class VII quadrilateral material to produce effective learning based on (a) the average score of the experimental class students achieve more than KKM is 81.79 so thoroughly in the classical experimental class and (b) the results of student learning achievement experimental class better than the control class. Score obtained for the experimental class is 81.79 and 65.88 for the control class.

Recommendations. Based on the conclusions set forth above, the researchers expect (1) In this study has produced the mathematics learning with Problem Posing learning model based character education CD-assisted learning in terms of critical thinking skills in the junior high school students of class VII quadrilateral material. In order to obtain a device that is really good and in order to enhance the learning tools that have been developed, the device needs to be tested in classroom learning and other schools that have similar characteristics equivalent to the experimental class; (2) With a valid learning device, the device will produce a system that can be used as an alternative in the implementation of learning, therefore it is a good learning device that must be consulted on experts in the field so as to produce a device that fits with the criteria, just after it can be implemented in learning activities; (3) Teachers should change the paradigm in teaching is centered on the teaching of teachers into teaching centered on learners, so that students can be actively involved in learning.

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