DEVELOPMENT OF THE LEARNING COMICS MEDIA TO TRAIN STUDENTS UNDERSTANDING MATHEMATICAL CONCEPTS IN THE CLASS VII SMP NEGERI 2 BELITANG III

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Abstract

The study aims to develop the learning comics media were valid, practical and have potential effects to train students understanding concepts in class VII SMP Negeri 2 Belitang III. Subjects in this study were all students in the class VII.4 SMP Negeri 2 Belitang III. Data collecting used Walkthrough, documentation, and test. Walkthrough was done by asking two tutor and teacher for feedback and suggestions related learning comics media developed by researchers. Documentation was used to complete all the necessary data in this study. The test is used to determine whether there is a potential effect on learning comic media. The development procedure of learning comics media are preliminary and prototyping stage with formative evaluation path (expert review, one to one evaluation, small group, and field test). To knowing that learning comics media is valid, is seen from contain, construct and criterion side at learning comics media making. The learning comics media is practical, is seen from using learning comics media as student reading and easier to carry everywhere. And to knowing potential effect the learning comic media to train students understanding concepts could see from student test result. The survey results revealed that the learning comic media has a valid, practical and has potential effects to train students understanding of concepts.

Keywords: The learning comic media, student's understanding concepts

INTRODUCTION

Permendiknas no. 14, 2007 (BNSP, 2007) explains that the main objective mathematics courses for junior high schools one of which is that students have the ability to understand mathematical concepts , explains the relationship between concepts and apply concepts or algorithms flexibly , accurately , efficiently and appropriately in solving problems. Based on these objectives, a student must have the ability to understand mathematical concepts before proceeding to the next stage is for students to explain the relationship between concepts and apply concepts.

But in fact students understanding concept is still relatively low. Based on the results of tests given to 38 students of SMP Negeri 2 Belitang III, 81.6 % of students have low capability of understanding the concept. While only 18.4% of other students have the capability of understanding the concept. From the identification sheet students' answers, it is clear that students still cannot accurately restate concepts, examples and distinguish or classify objects according to the example of certain properties in accordance with the concept. Students also cannot use, exploit and choose certain

procedures, present concepts in various forms of mathematical representations and apply the concept or algorithm in solving the problem.
There are many factors that affect students' understanding of concepts. One of them is due to most students regard mathematics as a difficult subject. Other causes are the lack of textbooks and the media needed in learning. This causes students' interest in learning mathematics declined. Indirectly it also affects the students understanding of concepts, because the learning process occurs due to stimulation of thoughts, feelings, concerns and interests as well as the students' attention. This is in line with the statement Sadiman et al. (2011) that the media is anything that can be used to deliver a message from the sender to the receiver so that it can stimulate the thoughts , feelings, concerns and interests and attention of students so that the learning process occurs.

In mathematics, the media has many important roles, one of which caught students' attention. In addition, the media also should be able to develop the imagination of students in learning mathematics. This is consistent with one of the stated uses of instructional media by Sadiman et al. (2011) that the use of appropriate media and varied learning can overcome the passivity of the students.

Comics are already known as a picture book that has a story line. As described by Wikipedia (2012), "comics is a visual medium used to express ideas via images, often combined with text or visual information". Fitriany (2004) states that the use of comics media can increase student motivation and provide a positive response. It was also stated by Novianti (2010) that instructional media comic improve students' lack of understanding. In addition as well as a medium of learning that students reading , learning media comic also draws attention and makes students feel relaxed and happy learning to feel less stressed. As stated Hadi (2005) based on his research that the use of the learning comic media in learning addition and subtraction of fractions can make students feel happy, relaxed and did not feel strained in the following study. That is the reason comics as a medium suitable for use in mathematics learning can improve student motivation, giving a positive response, enhancing students' lack of understanding, draw attention and make students feel relaxed and happy learning to feel less stressed.

Quadrilateral is a matter of mathematics that learning could use the learning comic media. We can illustrate the concept in the form of a rectangular image so easily understood and remembered by the students. By describing the material rectangles into comic book form, students will be more interested in learning the material. This is in line with the stage of development where the students at this stage (students aged around 11 or 12 years to 14 or 15 years old) have an interest in the problems of mental life that is directed at a new solution (Piaget, in Hergenhahn, 2008). In this case the new solution offered is a medium of learning comics.

Based on the above, researchers interested in conducting research entitled " Development of the Learning Comics Media to Train Students in the Class VII SMP Negeri 2 Belitang III ".

THEORETICAL FRAMEWORK

Mathematics Learning Objectives

In the study of mathematics students are expected to have the capability as stated in Permendiknas no. 14, 2007 (BSNP) about the purpose of mathematics courses as follows: 1) Understanding a mathematical concept, explains the relationship between concepts and apply the concept or algorithm is flexible, accurate, efficient, and precise in solving the problem. 2) Using the pattern and nature of reasoning, mathematical manipulation in generalizations making, compile evidence, or explain mathematical ideas and statements. 3) Solve problems that include the ability to understand the problem, devised a mathematical model, solve the model and interpret the obtained solution. 4) Communicate ideas with symbols, tables, graphs/charts, or other media to clarify the situation or problem. 5) Having respect for the usefulness of mathematics performance of life, which is curious, attention, and interest in studying mathematics, as well as a tenacious attitude and self-confidence and problem solving.

Mathematics Concepts Understanding

There are several indicators of the ability of understanding the concept as a result of learning mathematics by Dikti No. 506/C/Kep/PP/2004 (BSNP) is as follows: 1) Declare re a concept; 2)Classify objects according to certain properties in accordance with the concept; 3)Gives examples and non examples of the concept; 4) Presenting concepts in a variety of forms of mathematical representation; 5) Developing the necessary and sufficient condition of a concept; 6) Uses, harness, and selecting a particular procedure; and 7) Applying the concept or algorithm to solving the problem.

Comics As Learning Media

"Comics is juxtaposed pictorial and other images in deliberate sequence, intended to convey information and to produce an aesthetic response in the viewer" (McCloud, 1994).

After the learning comic media design finished, then it validated through several stages. The stages are expert review, one to one and small group evaluations. At the stage of expert reviews, instructional media comic validated by experts. After that, comic tested to some students. This is the stage where one to one evaluation stage and in this stage will be revised. This was followed by small group stages and field tests.

METHOD

This research is a descriptive study that aims to develop learning comics media were valid, practical and have potential effects to train students understanding concepts in class VII SMP Negeri 2 Belitang III. The subjects were all student in the class VII.4 SMP Negeri 2 Belitang III. The Development procedure include: 1) preparation phase (preliminary); and 2) prototyping with formative evaluation stages. The things done in the preparation phase is determine location, time, research subjects, reviewing some literatures on the development studies that have been done with regard to the planned research. Furthermore, there are several stages in the prototyping with formative evaluation as described by Tessmer (1993), among others: 1) expert review, at this stage, learning comics media that had been developed by researched and then validated by Dr. Yusuf Hartono, Drs. Purwoko, M.Si and Ratna Dewi S.Pd.; 2) one to one evaluation, at this stage, learning comics media has been validated and improved then tested to 3 students of class VII.; 3) small group, at this stage, learning comics media tested on a study group consist of 6 students class VII.; 4) field test, after learning comics media

improved by the comments obtained in the previous stage, so do use the implementation of learning comics media.
Here is a formative evaluation design flow.

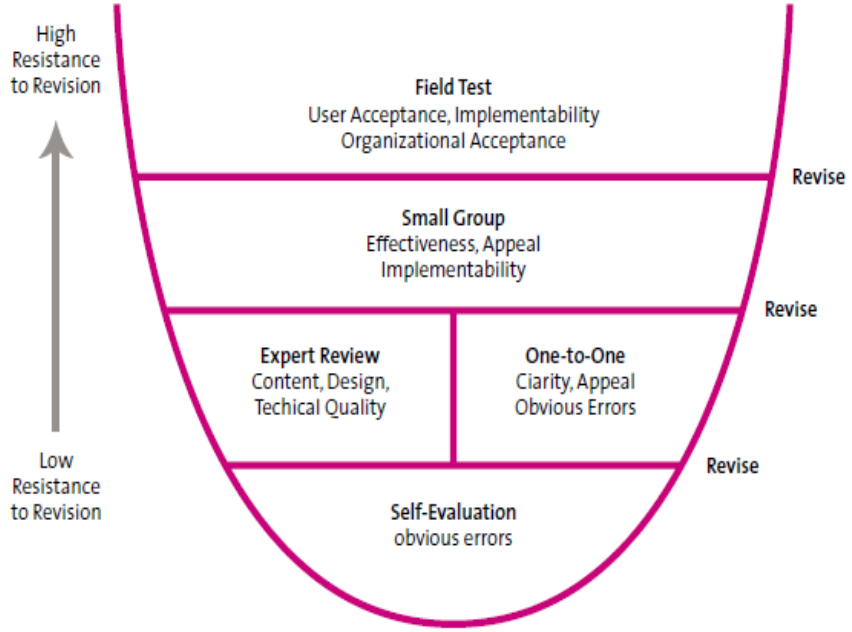

Figure 1 Chronology of formative evaluation design (Tessmer, 1993; Plomp, 2007)

RESULT AND DISCUSSION

In the preparation phase, before preparing learning comics media, researcher first created a lesson plan as an appropriate guide in the preparation learning comics media. Then on expert review phase, there are some improvements such as change the syntax on the subtitles, change the steps to get a broad trapezoidal formula, and some images and character roles in learning comics media. In one to one evaluation phase, the learning comics media had been revised previously tested to 3 students of class VII and based on comments and third difficulties these students, there are some improvements that frames or boxes on each page reduced to not much empty space, the image must be colored, bound like general comics. The next stage is small group phase that was tested on a study group consisting of 6 students of class VII. In this trial, there is no difficulty for these students learning use the learning comic media. After going through these phases, the learning comics media had been revised is ready tested in field test stage. The following the learning comic media is ready for learning.

Figure 2. The learning comics media

In this lesson held 4 meetings, where the fourth meetings conducted final exam. At this field test phase, the results are used to determine how the role of the learning comics media in training students understanding concepts. The following data were obtained.

Table 1 Frequency and percentage of students understanding concepts ability at each meeting.

Understanding concepts category	Meeting I		Meeting II		Meeting III		Meeting IV		Percentage of average
	F	%	F	%	F	%	F	%	
The best	22	66,7%	13	39,4%	8	24,2%	21	63,6%	48,5%
Good	3	9,1%	6	18,2%	14	42,4%	11	33,3%	25,8%
Enough	3	9,1%	7	21,2%	9	27,3%	1	3,1%	15,1%
Less	5	15,1%	7	21,2%	2	6,1%	0	0%	10,6%
Least	0	0%	0	0%	0	0%	0	0%	0%

Furthermore, the student scores are converted and compiled into the following categories.

Table 2 Frequency and percentage of overall students understanding concept

Value	Understanding concepts ability category	Frequency	Percentage
81-100	The best	19	57,6%
71-80	Good	10	30,3%
61-70	Enough	4	12,1%
41-60	Less	0	0%
0-40	Least	0	0%
Total		38	100%

The purpose of this study is to develop the learning comics media were valid, practical and have potential effects to train student's understanding concept in the class VII SMP Negeri 2 Belitang III.

Based on the analysis of the test results at the first meeting, there are 3 students in enough understanding the concept category and 5 students weren't less category. At the second meeting, 21.2% of students are still in the category of less understanding of the concept. There were 7 students who still have less understanding of the concept. At the third meeting, 6.1 % of students were in the category of less understanding of the concept. Meanwhile, the fourth meeting , tests conducted covering the entire understanding of the concepts and indicators tested material is the material learned at a meeting I, II and III. At this meeting 63.5 % of students included in the category of understanding of the concept is very good, 33.3 % of students included in the category of a good understanding of the concept, and 3.1 % were included in the category of understanding the concept of enough.

There are five indicators used in the students' understanding of concepts on the subject of this quadrilateral, namely the ability to restate a concept, the ability to set an example and not an example of the concept, the ability to present concepts in a variety of forms of

mathematical representation, the ability to use, exploit and choose certain procedures, and the ability to apply the concept or algorithm to solving the problem. based onfiveindicatorsobtainedthe followingpicture.

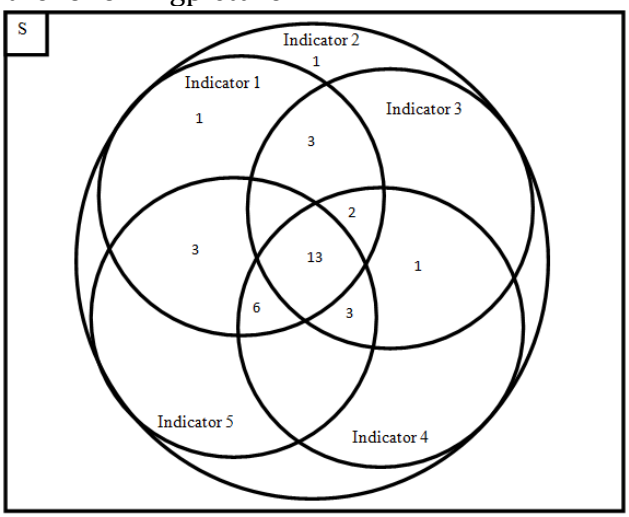

Figure 3 Venn diagram to set the frequency of students understanding concepts in each indicator

In this study, there are several obstacles that make the most of student learning less than the maximum in building the capability of understanding the concept of students, among others: lack of understanding of the students in understanding the language and syntax so that there are students who have not been able to present concepts in a variety of forms of mathematical representation, in other words lack of student understanding of the material prerequisites associated with learning materials for research; students used to rely on a single source which at the time of study each student shall wear a learning medium of comics as a source of learning and limited their textbooks as references another, but in this case the students mostly glued to the media that they think are interesting than reading comics instructional media package as an additional reference books, so that they get the knowledge of instructional media merely comic; existence of laziness and lack of thoroughness students in understanding problem.

CONCLUSION

Based on theresearch results, it can be concludedthat thecomichasproducedthe learning comics media werevalidandpracticalas well as havinga potentialeffectin traininginunderstandingthe concept ofclass VIIstudentsof SMP Negeri2BelitangIIIwithan averagepercentageof84.3% understanding concept.

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