THE DEVELOPMENT IN APPLYING MATH BILINGUAL COMIC ON COMPUTER BASED AT ELEMENTARY SCHOOL

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Keywords:	ABSTRACT			
Math Bilingual Comic	This paper is a research and development. Development of learning			
on Computer Based	tools following the Atwi Suparman instructional development model.			
	Learning instrument play an important role as a tool to ecourage			
	learners to be more active in learning and teaching process.			
	Teaching through Foreign language and also oriented to the world is			
	requiered to face Asian Economic Community (AEC), based on this			
	reason so applying math bilingual comic, Indonesian Language and			
	English, computer based is developed.			
	The innovation on the development of learning instrument is			
	requiered which is developed with bilingual comic on computer			
	based and focus on teaching of mathematics.			

INTRODUCTION

Technological advances in today's era have an impact on many things, One of the impacts of technological progress we can feel on the world of education. There are so many new kinds of learning media that we use to optimize the process of understanding in the learning process.

Media is anything that can be used to transmit messages from senders and receivers so as to stimulate thoughts, feelings, interests and attention in such a way that the learning process takes place (Sadiman, 2002: 6). Tarigan (1995: 209) argued that the selection of images should be appropriate, interesting and can stimulate students to learn. An interesting image media will attract students' attention and make students respond early to the learning process. The image media used in the lesson will be remembered longer by the students because of its concrete and non-abstract form. Images are a form of universal communication expression known to a wide audience.

All of the current learning process can not be separated from media interference as an intermediary in the delivery of information and understanding of the lessons to the students, Learning media is also many kinds and also various usefulness. In attempting to use the media as a tool, Edgar Dale entered into a classification of the concrete to the abstract :



Figure 1. "Edgar Dale's conical experience" (Susilana and Riyana, 2009: 7)

The use of computers in the field of education, especially in learning, is actually a link from the history of learning technology. Computers are very familiar in human life from children to adults. The use computers can support the work, of creativity produces even just for entertainment often makes people easily use various purposes, the computer for Reasonable in this era of globalization, the process of learning through the use of computers can be applied early in elementary school.

According to Hamzah (2008: 2) that "The design of learning is a satisfactory way to make activities can run with a variety of anticipatory steps to minimize the gap that occurs so that the activity reaches the intended purpose" Then teachers need to make a mature plan, and devise effective strategies and efficient implementation will be very helpful in the implementation to achieve the goals set.

Suparman (2012: 86) argued that the design of learning is a systematic blend of process in creating instructional system effectively and efficiently through instructional activity sequences, organizing teaching materials and students, equipment and materials, and time spent in learning process. Instructional systems intended to solve learning problems or improve the performance of learners through a series of problem identification, development, and evaluation activities.

Asrori research results (2013: 19) shows that the design of learning is a discipline related to understanding and improvement of one aspect of education, namely the learning process. The purpose of the activity of making the learning design is to create the optimal means to achieve the desired learning objectives. The purpose of this instructional design so that elementary school students can learn mathematics through computer-based mathematical thematic stories.

Based on this information, we can conclude that the pattern of education is also influenced by technological advances that impact the application of learning media elements as a transmitter of information and discussion in the learning process. In its use we need to choose exactly what the appropriate media and suitable for use in teaching and learning process, it is reviewed various factors such as child psychology, child's learning readiness, and child control over the media.

Actually in the learning in school a lot of learning media that can be used, Including using computer-based picture story media as a medium of instruction in elementary school on mathematics subjects. Computerbased picture story media is a quite unique medium and describes what oral thoughts are captured by students. Pictorial story is also an interesting media especially for elementary school students because it contains a variety of images that compete with interesting colors that add interest in learning

RESEARCH METHOD Type of the Research

This research uses qualitative approach, using instructional development research Atwi Suparman Models (Suparman, 2012: 116). Was conducted from September 2015 to February 2016, with a classroom trial at SDN Margahayu XX, East Bekasi on 05 December 2015.

Target/ Research Subject

In accordance with the focus of research, the development of the use of computer-based mathematical comics in primary school education, the subject of research in this study is divided into two stages. Subject of research at requirement analysis phase is teacher, while research subject on product feasibility test is expert in science and media of learning and trial in class.

Procedure

The first activity identifies instructional by collecting data through interviews and observation, The process starts from identifying the gap, followed by formulating the General Instructional Objectives. For the activity, perform instructional second analysis, which describes the competencies that exist in the General Instructional Goals, make subcompetences, basic competencies, specialized competencies, smaller and identify relationships between subcompetencies with each other. The third activity identifies the behavior and characteristics of the students by identifying the behavior and characteristics of the student. Then the fourth activity. determining the Special Instructional Objectives that must contain elements that can provide guidance to the compilers of the test in order to measure the behavior in it. For the fifth activity, make a learning result assessment tool, learning result assessment tool will be used to measure the success of the students in mastering the competencies set. The sixth activity determines the strategy that includes learning the introduction, presentation, and closing, both the instructional content outline and the

three launching systems consisting of instructional methods. media and instructional tools. well as as time allocations. All components are integrated and function together in the form of instructional strategies to achieve learning objectives. For the seventh activity. developing instructional materials, at this stage is done is to compose the basic mathematics lesson of computer-based primary school. Finally, conduct a formative evaluation with observations and interviews to media experts, materials experts and simulations to students to obtain comments and opinions on the lack of instructional design and instructional materials developed. Evaluation results will be output and finished products.

Data Analysis Technique

Data collection techniques in this study using observation, literature study, documentation, interviews, and questionnaires. Data collection is used to analyze the needs and record product improvements in the process of making computer-based bilingual thematic comics for elementary school students.

FINDINGS AND DISCUSSION

Identification of Instructional Needs andWriting General Instructional ObjectivesDevelopmentofComicStoriesMathematics

Integrative thematic learning is a learning approach that integrates the various competencies of the various subjects into the various themes. The integration is done in two ways, the integration of attitudes, skills and knowledge in the learning process and the integration of various related basic concepts. The theme knows the meaning of basic concepts so that students do not learn basic concepts partially. Thus the learning gives a complete meaning to the learners as reflected in the various themes available. In integrative thematic learning, themes are chosen with respect to nature and human life. Basic Competencies of Natural Sciences and Social Sciences organized into other subjects have an important role in the development of Basic Competencies of other subjects

From a psychological point of view, students have not been able to think abstractly to understand the content of separate subjects unless classes IV, V, and VI are already beginning to be able to think abstractly. The psychological outlook provides a solid foundation for the integration of Basic Competencies organized in thematic learning. From the above conditions, it is necessary to innovate in learning mathematics at the elementary school level. One way is to understand learners and get closer to everyday life.

From the results of writing through interviews and questionnaires to 8 respondents with the following conclusions:

1. All respondents believe the use of learning media can ease the process of learning to teach math

2. Six respondents said the use of media can facilitate students' understanding of the materials and concepts, two respondents said the need for concrete media delivery.

3. All respondents strongly support the use of technology and computer utilization to support interactive learning process.

4. All respondents stated additional supplement needed for students in the framework of concept maturation.

5. All respondents strongly agree the use of supplements in the form of mathematical thematic stories and can use computer media so that students can know the application and daily benefits of math. The use of this media can also make students more creative because it can also improve the ability to tell stories.

From the results of interviews and questionnaires can be concluded need to be

made a practical learning media, fun and easy to understand by students and also can be made with computer-based for class III with sub fractions. General Instructional Objectives can be illustrated with the following core competencies and basic class III competencies

Table	1.	Core	Competencies	and	Basic
Competencies Class III Fractions					

CORE COMPETENCY	BASIC COMPETENCIE S
1. Accept and live the religious teachings he embraces	
2. Having honest, disciplined, responsible, polite, caring, and confident behavior in interacting with family, friends, neighbors, and teachers	2.3 Shows fair behavior in distributing one piece or several pieces of cake, fruit and the like to a number of people in applying the concept of fractions
3. Understand the factual knowledge by observing [listening, seeing, reading] and asking questions based on curiosity about himself, God's creatures and activities, and the objects he encounters at home, school and playground	3.3 Understand simple fractional concepts using concrete objects / drawings, and determine the smallest and largest value

In this case, based on the above instructional needs analysis, the following formulation:

"If given the Mathematics exercise about the third grade Mathematics lesson, then the 3rd graders of elementary school will be able to understand and do well, and can solve the problems of self-training, fast, and at least 80% true on the fractional material".

Perform Instructional Analysis

In this instructional analysis it is necessary to elaborate the existing competencies in General Instructional Objectives into a description of the following competencies:

1. Able to understand the concept of fractions

2. Be able to declare fractions

3. Be able to determine a fraction of the value

4. Be able to determine the fractional value of the shaded image

5. Be able to sort the fractions

6. Able to identify the elements of the problem / question of the story relating to the application of fractions

7. Able to determine the mathematical sentence model of the story problem related to the concept of fractions

8. Be able to solve the story related to the fraction

The competency map can be illustrated as shown below:

If given a matter of Maths training on class III Mathematics lesson the fractions then the third grade students of elementary school will be able to understand and do well, and can solve the problems of self-training, fast, and at least 80%



Figure 1. Map of Achievement Competence of Learning Outcomes

Identify Student Behavior and Character

Here is the behavior of subordinate (entery behavior) grade III elementary students in learning fractions based on the analysis of the initial characteristics of elementary school students class III, are:

1. Students have basic competence in teaching and learning process.

2. Students do not have the ability to apply fractional learning.

3. Students do not have the discipline to manage the study time.

4. Students are not accustomed to systematic and programmed learning.

5. Students are not used to learning while thinking to apply it in everyday life.

6. Students generally do not yet have strong internal motivation for the application of fractions in daily life.

7. Students have a tendency to get too bored quickly in following the learning of mathematics with strategies and methods applied by teachers.

Write a benchmark reference test

At this stage the author makes a benchmark reference test fractions with the essay form.

Develop Instructional Strategies

Describe the common components of learning materials and procedures used in achieving learning outcomes

Develop Instructional Materials

At this stage developed a comic learning media bilingual computer-based mathematics stories with power point media for class III students by creating a short story comic in accordance with the theme contained in the curriculum 2013. Comics developed is a comic with the theme "Share That Beautiful" with a discussion of mathematics Fractions.

Explaining the understanding of mathematical concepts into the form of pictorial stories on a particular theme of life is expected for learners to enjoy mathematics lessons and able to learn mathematics as an applicative form in real life ..

The character that is developed is a flat wake shape with the main character named Segi and Lingka. Segi describes a person with a triangular and circular shape representing a person with a circular face shape.

The purpose of using facets and circles as characters is to introduce learners to wake up flat and prefer math lessons.

The thematic comics use bilingual two languages, namely Indonesian and English so that learners can also know the story by using English.

Conducting Formative Evaluation

Evaluation stage is done by giving a questionnaire quality assessment of media learning to media experts, material experts and students. For the media expert is an expert in visual communication design. Overall validator assess the learning media is quite good. In the aspect of the quality of media display that needs to be emphasized is the strengthening of the letters that are more dominant than the background color, it needs the same style of style in each page to fit the theme, the duration between slides. For the language aspect is considered good enough, for the emphasis of the emphasis is not to use images and letters that overlap. For material experts conducted by two elementary school teachers, the validator as a whole assessed the learning media is quite good seen from the aspects of the curriculum, presentation of material, linguistics and evaluation. Noteworthy is the need for clearer explanations and more. For the evaluation of the students' assessment, a small class trial was conducted on 17 respondents, outlining a good assessment. Trial experiments in math story comics were conducted at SDN Margahayu XX, Jl. R.A. Kartini Kelurahan Margahayu, East Bekasi

on 05 December 2015. The classes are divided into four groups, the observations made about the quality aspects of media display, language, implementation and security. Students are enthusiastic about the comics of this story, the story is simple so easy to understand, this is seen from the observations that the author did. From the aspect of the contents of the story, learners can easily digest the story because the contents of the comic story is made with as simple as possible, so that the purpose of the delivery of thematic meaning of sharing is beautiful conveyed well.

The selection of thematic computer-themed comic design using power point with design, drawing and good color contrast make learners like this mathematical thematic comic.

The explanation of mathematical concepts in this comic is a very easy explanation, because it is a basic understanding of fractions so that learners more easily understand the mathematical concept without feeling burdened.

CONCLUSION AND SUGGESTION Conclusion

Based on research conducted. the development of computer-based mathematical thematic comic story is made to meet the needs of students as a supplement understanding the concept of mathematics is more easily understood. This comic is made using power point so that the explanation of the story is more interactive. In this comic contains thematic stories with the theme of sharing is beautiful. An understanding of the mathematical concepts given to this comic is understanding the concept of fractions.

Suggestion

Based on the results of research and conclusions, the authors can suggest as follows:

1. Teachers can use this computer thematic comic media as a supplement in teaching mathematics education, especially in class III students. Because this comic and comics such as it can explain the basic concepts of mathematics and associated with applications in everyday life.

2. Learners can utilize comic computerbased math stories as a source of referrals in his spare time and make it as a start to the students who like to read.

3. A more in-depth examination is needed to test the effectiveness and influence of using computer-based comic learning media in order to improve the quality of the product better.

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