International Journal of Engineering & Technology, 7 (2.13) (2018) 464-466

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research Paper

Multimedia Flash Basic Mathematic Learning for Primary School

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Abstract

The development of education world at this time no doubt has entered a new era, namely the era of global economy, and the era of science and information in various fields including in the field of education that gave birth to the concept of e-learning. The learning process is the result of the synergy of the three main components of learning, namely learners, teacher competence, and learning facilities and from these three components then the learning of mathematics algebra will be more meaningful and appealing to students if teachers can convey and present issues more easily understood and close to the daily life of students by providing material in the form of animated multimedia designed using Adobe Flash CS6.

Keywords: *Algebra, Education, Media Education, Multimedia Learning*

1. Introduction

The development of information and communication technology in 2018 has increased very rapidly and can be found almost in all areas of human life[1]–[4], one area of information that almost certainly experienced a very rapid development is the use of multimedia technology as a medium of media education[5]–[8]. There are still many manual methods are being widely used[9] especially on basic mathematics education. Submission of this material still uses a lot of media that is manual like a whiteboard along with the images contained in the book[10].

Mathematics teaching in the classroom affects the level of students' understanding of mathematics[7], [11]. This is what requires that when learning Mathematics it should be packed as interesting as possible, one of them is by utilizing information technology in the form of multimedia or simulation to visualize the material[12]–[14]. Mathematics learning media through technology must be a mandatory alternative that must be mastered by prospective teachers of Mathematics, so that in his teaching to student it does not seem monotonous and boring.

Algebra and geometry is one of the lesson material contained in mathematics[15]–[17], algebra and geometry for most students is a difficult topic especially if the approach by teacher that is not well known, to help overcome the problem is designed a multimedia system that is easy to use with addition the material core of algebra and geometry into the system so it is easy to learn for students. Multimedia applications created must have a visual effect and sound to provide an explanation in each subject matter.

2. Methodology

Learning is a process of interaction relationship between educators and learners. Learning as a combination consisting of human elements, materials, facilities, equipment, and procedures that affect each other to achieve learning objectives[18], [19]. Selection of methods, materials packaged in a focused learning process will greatly assist in the process of achieving the success of the learning objectives optimally, especially in learning mathematics. In the implementation of the learning process should be done gradually according to the flow and capacity, a mathematics teacher cannot provide a material subject of teaching at random, unstructured and directed. Focused patterns, good instructional guidance, delivery methods and good media can create effective and efficient results in accordance with the learning objectives to be achieved[20]–[22].

Implementation of learning is the result of integration of several components that have its own function with the aim that the achievement of learning objectives can be met[20], [23]. The main characteristic of learning activities is the interaction. Interaction between students and their learning environment, whether it is with their teachers, friends, tools, learning media, and/or other learning resources. While the other features of this learning relate to the components of learning itself. Where in learning there will be components as follows; objectives, materials, strategies, media, and learning evaluations[24], [25].

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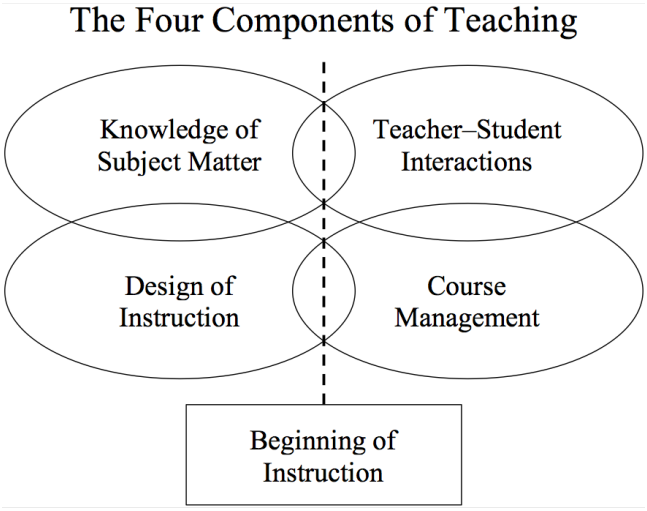


Fig.1: Component Teaching

Some of the subjects of primary school mathematics include:

A. Algebra and Numbers
   1. Mathematical Sentences
      Mathematical sentence material consists of statement sentences, closed sentences, open sentences, similarities, inequalities, and inequalities.
   2. Symbol of Numbers
      The number symbol contains the numbers and their symbols, the symbol of the decimal number, the symbol of the number with the base not the ten, the symbol of the Roman numerals.
   3. Integers
      The integer material consists of various integers, integer sequence properties, integer counter, integer sum, integer subtraction, integer multiplication, integers work properties.
   4. Primes
      The prime number material consists of prime number, factor tree, prime factorization, prime number simulation
B. Geometry
   The material consists of a variety of two-dimensional figure, wide and circumference formulas and simulation.

Algebra learning is made using Adobe Flash CS6 so that multimedia applications can run well on various operating systems.

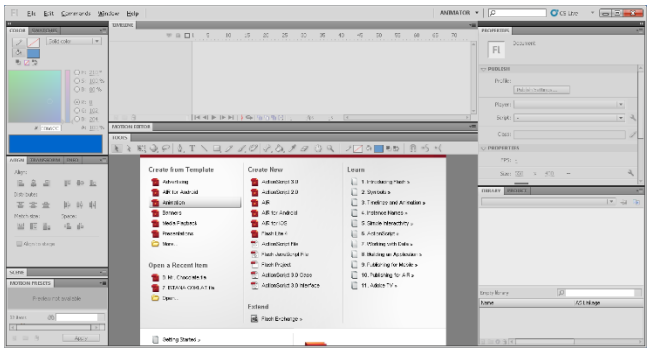


Fig.2: Adobe Flash CS6 for Development Tool

3. Results and Discussion

Testing on multimedia application learning algebra and arithmetic created using Adobe Flash CS6 done gradually, the first thing to do is run the application with the interface as follows:

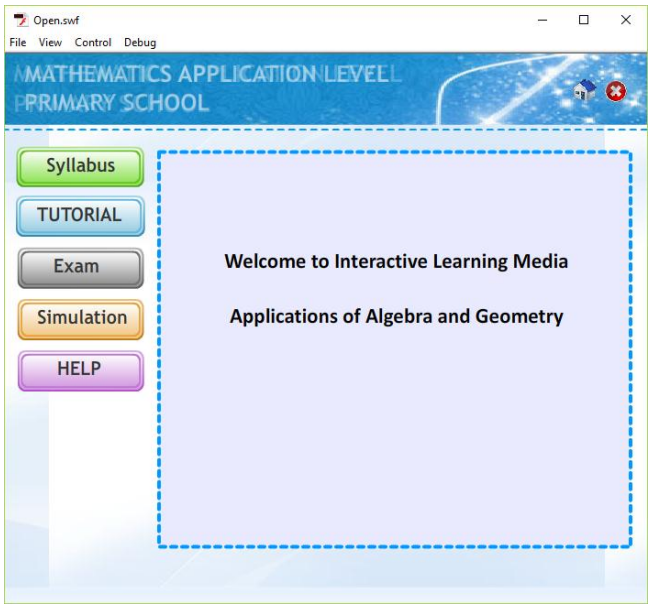


Fig.3: Main Display

There are several menu options that can be used to display algebra and arithmetic learning materials, for example if the tutorial displays the following results:

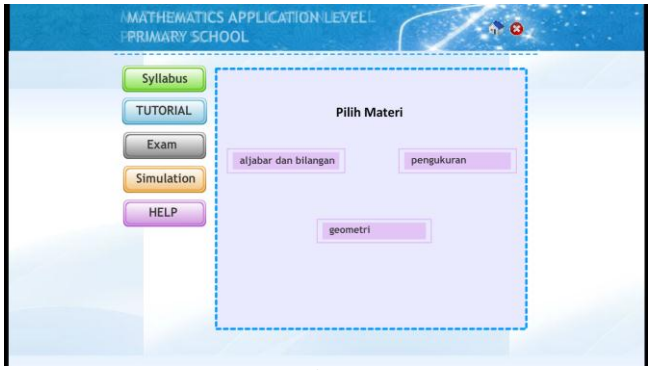


Fig.4: List of Menu Tutorial

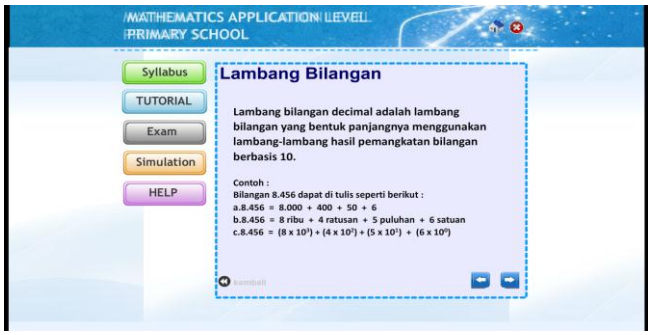


Fig.5: Information about *Lambang Bilangan*

There is some more information that can be used to help the learning process of algebra and arithmetic to primary school students, from the application used questionnaires made for users in this case are teachers and also elementary school students, the results in table 1.

Table.1: Comment and Suggestion

No	Suggestion and Comments
1	Animation less much especially on the part of the process of completing the calculation is less detailed and clear.
2	Learning using multimedia flash is very effective to use and interesting.
3	Add more game algebra and arithmetic
4	Improve design multimedia education

Multimedia learning algebra and arithmetic can run well and use to students can also be understood although the need to add some objects that have been made.

4. Conclusion

Algebra and arithmetic learning multimedia learning gets a positive response from users, development of multimedia flash applications can be developed based on android and also has the feature of access rights for teachers and students to control students who learn and successfully follow the material presented.

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