

## THE DEVELOPMENT OF MACROMEDIA FLASH 8 BASED ON LEARNING MEDIA ON ARITHMETIC SOCIAL SUBJECT FOR GRADE VII

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### ABSTRACT

Learning media in the learning process of mathematics can help students understand the abstract mathematical concept and make learning more exciting and interactive. However, in reality, at school, the availability of instructional media is still limited. This study aims to develop a suitable learning media based on Macromedia flash eight on the arithmetic social subject for grade VII SMP/MTs in learning mathematics. The research includes research and development using Research and Development (R&D) research methods with the following steps: potential and problem, data collection, product design, design validation, design improvement, product testing, product revision, trial use, product revision, and the final product. The research subjects are media experts, subject experts, and students of grade VII State Junior High School 1 Yogyakarta (SMP N 1 Yogyakarta) and State Junior High School 1 Kalasan (SMP N 1 Kalasan). The data are analyzing techniques using qualitative analysis that converted into a form of quantitative value. The data collecting techniques are using interviews, observations, and questionnaires. The product of learning media that has been developed was assessed and validated by three math experts learning media and three math experts learning subject. The assessment of media experts resulted in an outstanding qualitative category. The assessment of subject experts resulted in an outstanding qualitative category, and the student assessment resulted in an excellent qualitative category. Based on those results, it can be concluded that the learning media that has been developed is appropriate for the use of the mathematics learning process.

**Keywords:** Learning Media, Macromedia Flash 8, Research and Development (R&D), Arithmetic Social.

### INTRODUCTION

The development of science and technology (Science and Technology) has brought rapid changes in human civilization. This development has changed the view of humans in finding and getting information more easily. Work that was initially done manually can now be replaced with a machine. One area that has had a significant impact on education. For example, in the field of education, the use of computers has evolved not only as a tool that is only used to assist administrative matters, but it is also possible to be used as an alternative in the selection of new learning media. This kind of thing needs to be responded positively by the teachers, especially mathematics subject teachers so that the computer can be an alternative media that can be used in the learning process.

The development of science and technology is increasingly encouraging renewal efforts to use technological outcomes in the learning process. One use of technology today is that learning is done remotely. Learning is done between students and teachers not face to face directly and requires a learning medium. Learning media that support distance learning, namely CD, E-learning, radio, computers, and television. It is expected that with distance learning, students can study independently anywhere and anytime.

By the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 65 of 2013 concerning Basic and Secondary Education Process Standards, is a criterion regarding the implementation of learning in educational units held interactively, inspirative, fun, challenging, motivating students to participate actively, as well as providing space which is sufficient for the initiative, creativity, and independence by the talents, interests, and physical and psychological

development of students. Thus, each education unit conducts a learning plan, implements the learning process, and evaluates the learning process to improve the efficiency and effectiveness of the achievement of graduate competencies. Thus the teacher is required to be able to develop skills in making instructional media.

Based on the results of interviews of eighth-grade students at SMP N 1 Yogyakarta on November 26, 2016, it can be concluded that students find it difficult to learn mathematics. Mathematics is a lesson that uses many formulas in solving math problems. Based on the interviews of Mrs. Sri Utami as a mathematics teacher at SMP N 1 Yogyakarta and Mr. Suryantoro as a mathematics teacher at SMP N 1 Kalasan concluded that learning media that is often used is LKS, the material in class VII even semester which for students feel difficulties is social arithmetic, especially in the section on the percentage of profit, percentage of loss, and how to determine single interest, tax. This is because the material is related to daily life. The practice questions on the material are usually in the form of great story questions requiring students better to understand the contents of the story in the problem.

Based on observations of learning at SMP N 1 Yogyakarta and SMP N 1 Kalasan on November 26, 2016, it can be concluded that the method used by teachers in teaching is the lecture method, mathematics is a lesson that uses many formulas in solving mathematical problems which, according to some students, become saturated. Lack of student attention to mathematics. This is indicated by the attitude of students sitting in the back seat, not paying attention to the teacher when the teacher explains the material. In the process of teaching and learning, there is still a lack of use of instructional media, and the teacher has not utilized learning media other than worksheets.

Based on the description above, researchers are interested in developing mathematics learning media using Macromedia Flash 8 on social arithmetic material for grade VII SMP / MTs. By using learning media, it is expected to eliminate the students' difficult impression of mathematics and increase student attention so that it can lead to motivation to learn. The learning process is more exciting and interactive so that it can increase student interest in learning in mathematics.

According to Asyhar, Rayandra (2012: 187), Macromedia Flash is one of the application programs used to design animations that are widely used today.

According to Nur Hidayat's research (2013), Macromedia Flash 8 has the advantage of being able to make interactive buttons with a movie, can make animated changes from one form to another, can increase student learning interest in mathematics. Other research conducted by Dwi Kurniawan (2014), Macromedia Flash 8, can make the learning process more interesting, interactive, and able to convey material messages through pictures and videos so that the material delivered is easier to understand. The development research aims to: design mathematics learning media using Macromedia Flash 8 on social arithmetic material for grade VII students of SMP / MTs and find out the appropriateness of mathematics learning media using Macromedia Flash 8 on social arithmetic material for grade VII students of SMP / MTs.

## **RESEARCH METHOD**

This research is a type of development research. This research is focused on the development of Macromedia Flash 8-based mathematics learning media, which is packaged in the form of Compact Disk (CD) for grade VII students of SMP / MTs on social arithmetic materials. Some criteria are determined to produce a good product; researchers use the model of Research and Development (R&D) procedures which consist of several stages, including potential and problems, data collection, product design, design validation, design revisions, product trials, revisions products, usage trials, product revisions, and final products.

The test subjects in the research and development of learning media consisted of validation test subjects and trial subjects. Validation subjects were media expert lecturers at Ahmad Dahlan University Mathematics, ICT teachers at SMP N 1 Yogyakarta, ICT teachers at SMP N 1 Kalasan and material experts by material expert lecturers at Ahmad Dahlan University Mathematics Education, mathematics

subject teachers at SMP N 1 Yogyakarta, mathematics teacher at SMP N 1 Kalasan. The trial subjects were grade VII students of SMP N 1 Yogyakarta and SMP N 1 Kalasan.

The sample selection technique in this study is to use random techniques. Based on the trials carried out for the subject of this research are the respondent's product trials were ten junior high students. While the respondents testing the use are junior high school students in one class. Data analysis techniques using qualitative analysis, which is converted into quantitative values. Data collection techniques, such as interviews, observation, questionnaires.

## RESULTS AND DISCUSSION

Analysis of the Media Expert Questionnaire

**Table 1.** Media Expert Questionnaire Calculation Results

No	Material Expert	Score	Qualitative Category
1.	Syariful Fahmi, M.Pd.	71	Very Good
2.	Bachtiar Yuliardi, S.Pd	69	Very Good
3.	Istiardi, S ST	69	Very Good
	Mean	69,67	Very Good

Based on the table, it can be seen that the average score of the results of the calculation of the media expert questionnaire is 69.67. This shows that the learning media developed are included in the qualitative category very well.

Analysis of Material Expert Questionnaire

**Table 2.** Results of Calculations for Media Expert Questionnaire

No	Material Expert	Score	Qualitative Category
1.	Drs. Uus Kusdinar, M.Pd	58	Very Good
2.	Suryantoro, S.Pd	54	Very Good
3.	Sri Utami, S SI	55	Very Good
	Mean	55,67	Very Good

Based on the table, it can be seen that the average score of the results of the material expert questionnaire is 55.67. This shows that the learning media developed are included in the qualitative category very well.

Analysis of Student Assessment Questionnaire

**Table 3.** Results of the Media Expert Questionnaire Calculation

No	Activity	Mean	Qualitative Category
1	Product Trial	54,75	Very Good
2	Trial Usage	53,61	Good

Based on the table, the average score of the results of the calculation of student assessment questionnaires on product trials is 54.75. This shows that the learning media developed are included in the qualitative category very well. The average score of the results of the calculation of the student assessment questionnaire on the trial use is 53.61. This shows that the learning media developed are included in the good qualitative category.

### 1. Potential and Problems

At this stage, interviews were conducted with mathematics teachers at SMP N 1 Yogyakarta and SMP N 1 Kalasan. Also, researchers made observations in class VII and interviewed several students of class VII in SMP N 1 Yogyakarta and SMP N 1 Kalasan. This aims to determine the learning process carried out by the teacher. Data obtained from the results of observations and interviews are as follows:

- a. Mathematics is still considered challenging by some students.
- b. Lack of student attention to mathematics.
- c. The teacher has not used learning media other than worksheets.

From the potential and problems above, researchers provide alternative solutions in the form of developing learning media based on Macromedia Flash 8 to support mathematics learning in social arithmetic material.

2. Data collection  
The data collection stage is gathering information from various sources related to product development. From the problems obtained from the potential and the problem, then sought a solution. One solution is to develop learning media based on Macromedia Flash 8 on social arithmetic materials for grade VII students of SMP / MTs. After the solution was found, the researchers collected reference books on social arithmetic. Researchers use books in making learning media related to social arithmetic materials.
3. Product Design  
The next step is designing the product to be developed. In designing the product to be developed, the researcher goes through several stages: determining KI and KD, designing instructional media design, making instructional media, and compiling research instruments.
4. Design Validation  
Media experts and material experts validate the learning media. Media experts are lecturers who support multimedia learning and ICT teachers in SMP / MTs, while material experts are expert lecturers in social arithmetic and mathematics teachers in SMP / MTs. Media experts and material experts provide assessments and suggestions for learning media through a questionnaire assessment sheet. If there are comments and suggestions from media experts and material experts, the instructional media is revised according to the suggestions.
5. Design Revision  
The design revision is the first revision after the media expert, and material expert advises learning media. After comments and suggestions from media experts and material experts are corrected, the learning media is ready for product trials.
6. Product Trial  
After the learning media has been repaired, the next step is product testing. Product trials were conducted at SMP N 1 Yogyakarta on July 25, 2017, and SMP N 1 Kalasan on July 26, 2017. Product trials were carried out each by ten students of class VII in the school computer laboratory. In testing the product, the researcher explains the instructional media and instructions for using instructional media. Students look enthusiastic about learning the material in the learning media and actively ask researchers. Next, the researchers distributed an assessment sheet in the form of a questionnaire to determine students' responses to the learning media. Based on the product trial, the input from students of SMP N 1 Yogyakarta is that there is no revision of the learning media. The product trials conducted at SMP N 1 Kalasan result is an improvement in writing that is small in size.
7. Design Revision  
After the product is tested in small groups, the product is revised again. The product revision of the product trial, namely, the improvement of the small size of the writing on the learning media, has been revised.
8. Trial Usage  
The trial run was conducted on August 3, 2017, at SMP N 1 Yogyakarta as many as 34 students in grade VII of SMP. While the trial use at SMP N 1 Kalasan was held on August 6, 2017, as many as 32 students of class VII.
9. Product Revision  
After testing the usage in SMP N 1 Yogyakarta and SMP N 1, Kalasan researchers found no more comments and suggestions to use learning media in the learning process.

#### 10. Final product

After the trial uses the results obtained an average score in SMP N 1 Yogyakarta as much as 54.03 with a good qualitative category and an average score at SMP N 1 Kalasan as much as 53.19 with a good qualitative category. So those mathematics learning media based on Macromedia Flash 8 is declared feasible, then the final product of learning media can be used in the learning process.

### CONCLUSION

This development research resulted in Macromedia Flash 8 based mathematics learning media products on social arithmetic material for grade VII students of SMP / MTs. The development research began with searching for potentials and problems in SMP N 1 Yogyakarta and SMP N 1 Kalasan. After the potentials and problems are known, the next step is to collect various information to find solutions to these problems. The right solution is to develop learning media.

Learning media are developed by making product designs first. After the product design is complete, the next step is to make the product. Media experts and material experts validate the finished product. In the validation process, there are comments and suggestions. The product is revised according to input from media experts and material experts. The next step is the product's trial, which is first tested on 10 grade VII students of SMP / MTs. If there is input from students in the product trial, then the product is revised according to the input. After the revision is complete, the next step is to use the trial.

Based on the calculation results of media experts with an average score of 69.67 has a perfect qualitative category, the results of the calculation of material experts with an average score of 55.67 have a perfect qualitative category, and the results of the calculation of student assessment in the trial use with an average 53,61 has a good qualitative category. So it can be concluded that the mathematics learning media based on Macromedia Flash 8 on social arithmetic material for grade VII SMP / MTs is suitable for use in the mathematics learning process.

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