The Development of Electronic Flash Worksheet Based on Adobe Flash Cs6 on Fraction Numbers in the Seventh Grade of Junior High School

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Abstract. This study aims to determine the quality and response of students from the use of Adobe Flash CS6-based Electronic Worksheet on fractions for the seventh-grade students of the junior high school. This research is a type of research and development, which is based on the Borg and Gall model. Data collection instruments used were questionnaires and tests. Data collection technique used was a questionnaire with a Likert scale. Data analysis techniques using quantitative descriptive data analysis. The results of this study are the feasibility according to media experts and material experts, as well as knowing the response of students from the development of instructional media in the form of the Electronic worksheet on fraction material. The results of the assessment of material experts and media experts obtained the criteria of Valid with an average value of material experts by 74% and media experts by 93%. Student responses toward the learning media obtained the criteria of very interesting with an average score of 3.46 and the electronic worksheet said to be an effective teaching material that can be used in the learning process.

Keywords: Adobe Flash, worksheet Elektronik, Pecahan.

1. Introduction

Education is very important for each individual both for personal interests and in his position as a citizen [1]. The application of education science is related to the development of knowledge and technology but still in line with the goals of national education and the educational goals of the 2013 curriculum [2]. National education goals include cognitive and psychomotor aspects and affective aspects. Likewise, the objectives in the 2013 curriculum are due to the development of spiritual and social attitudes, curiosity, creativity, and cooperation carried out in a balanced manner with the development of intellectual and psychomotor abilities [3].

Activities that become routines where educators explain the material and students receive material.[4] During the learning process, of course, students need interesting teaching materials as a tool that is used as a source of learning information,[5] so that learning materials are needed with interesting innovations so that students are enthusiastic and happy to learn. One of them is by developing learning media, one of which is mobile math which can be interesting to participate and be enthusiastic about learning activities.[6]The purpose of this study was to describe the suitability of interactive media based on Adobe Flash CS6 Professional and the influence of the application of interactive media in the 2013 thematic curriculum learning process.[7]Adobe flash can be used in various studies that depend on response times despite limitations.[8]

The results of previous studies developed electronic worksheet in financial accounting subjects for class XI.[9]In addition, other research developed electronic mathematics worksheet with Discovery Learning approach for junior high school students [10]. Then other research developed an electronic smart worksheet to increase the interest in learning high school students [11]. Subsequent research developed worksheets with image media on accounting lessons for class X students of Vocational High Schools [12]. Then the next research develops worksheet in the subjects of engineering mechanics with a contextual approach for students of class X SMK [16]. Subsequent research develops inquiry-based worksheets for understanding the science concept of fifth-grade students [17]. It can be concluded from the discussion above that in this study e-learning can be developed with various innovations as teaching materials for students.

Based on the previous research described above, in this study, the researchers are interested in conducting a study that is developing electronic data based on adobe flash Cs6 on fractions of seventh grade of. Adobe Flash Professional CS6 is animated graphics software that can create graphics objects and manipulate them so that we can directly create design objects without having to use supporting graphics software such as Illustrator or...
Photoshop. Adobe Flash can be used as a support for developing learning media that is electronic or web-based [18].

Students' skills in fraction material are still lacking at the beginner level, students still have difficulty in understanding fraction material and solving problems related to fractions. Therefore in this study researchers developed electronic data on fraction numbers [19]. This research will be different from the previous research where this research not only develops Adobe Flash CS 6 software, but this combination also combines with the Illustrator software to complete the evaluation section where students do not need a notebook to do the exercise questions, because Adobe Flash is a lot of applications animations so students are not bored with ordinary printed books that have no animation so students learn while knowing.

2. Research Methods
This type of research is research and development. In this research and development using the Research and Development method [20]. This research and development use the (R & D) Research and Development method, by utilizing computer learning media as a learning medium, the purpose of which is to produce a learning media in the form of interactive media, which contains learning tutorials and evaluation questions. In this study, interactive learning media were developed. The subjects of the trial in this study were students of seventh grade of SMP PGRI 06 Bandar Lampung. Development is carried out on mathematics subjects with the subject fractions.

This research refers to Borg and Gall Model, this model includes: 1) Potential and problems, 2) Data collection, 3) Product Design 4) Design validation, 5) Design Revision, 6) Product Testing, 7) Product Revision, 8) Test Field Implementation, 9) Final Product Improvement, 10) Dimensions and Implementation, from the Borg and Gall model then developed [21].

This step can be adjusted to the needs, researchers. Thus the steps for using Research and Development (R&D) are limited as follows:

3. Results and Discussion
This study resulted in a product in the form of developing electronic worksheet based on adobe flash Cs 6 on fraction for the seventh-grade students of the junior high school, this research was developed using research and development procedures (Borg and Gall) [21]. The results of each stage are first; the potential and problems of the initial observations obtained results that in the teaching and learning process have not utilized school facilities such as wifi, projectors, and computer labs which can be used as additional means of learning resources, besides the fact that not all students meet KKM standards, especially in friction material.

The next stage is data collection, collecting reference sources such as mathematical journals relating to the development of Adobe Flash CS6-based electronic worksheet for the seventh-grade students of junior high school on fraction material.
After the data is collected, continue to design the learning media products. Product design for developing interactive learning media with Adobe Flash software for the seventh-grade students of junior high school on fractions material consisting of competencies, materials, practice questions, writers, literature, and evaluation. Continued design validation, validation was carried out by material experts and media experts:

a. Expert material validation

Validation of material experts aims to examine the completeness of the material, the truth of the material, and systematics of the material carried out in 2 stages. The results obtained that the learning media is feasible and ready to use with the criteria of "feasible" can be seen in Table 1.

| Table 1 Results of Material Experts |
|------------------------------------|
| Average Score | Criteria | Description |
| 78%          | Feasible | Not Revised  |

b. Media Expert Validation

Validation of media experts aims to examine the attractiveness and presentation of the learning media, carried out in two stages. The results are obtained that the learning media is feasible and ready to use with the criteria of "Good", can be seen in Table 2.

| Table 2 Results of Media Experts |
|----------------------------------|
| Average Score | Criteria  | Description |
| 93%            | Very feasible | No Revision |

After the product design was validated through the assessment of material experts, and media experts, researchers revised the product design developed based on these expert inputs.

a. Revisi Expert Material

The following is the view that must be corrected after getting a suggestion from the validator:

![Figure 2 Before Material Revision](image)

Following is the display after fixing it with the validator:

![Figure 3 After Material Revision](image)
b. Revision of Media Experts The following is the view that must be corrected after getting a suggestion from the validator:

![Figure 4 Before Media Revision](image)

Following are the validator's corrected display:

![Figure 5 After Media Revision](image)

Furthermore, after the design improvements have been made and declared valid, product trials are carried out. The results of trials related to attractiveness were carried out through two stages, namely small group test and experience field testing an increase in the average score on its aspect, the comparison of the results of the trial can also be seen in Table 3.

### Table 3 Small Scale Trials

| Number of Feasibility | Score Average | Feasibility Score | Criteria       |
|-----------------------|---------------|-------------------|----------------|
| 749                   | 55.39         | 3.69              | Very interesting |

Table 3 above shows the results of the small group trial which was tested for 10 students with the acquisition of 3.69 with the criteria of "very interesting". From the acquisition, the media is declared good to use so that there is no revision and can proceed to large group trials. Large group test tables can be seen below:

### Table 4 Large-Scale Tests

| Number of Feasibility | Score Average | Feasibility Score | Criteria       |
|-----------------------|---------------|-------------------|----------------|
| 1,469                 | 114.48        | 2.46              | Very interesting |
Table 4 above shows the results of a large group trial which was tested to 24 students that obtained the score of 3.46 with the criteria of very interesting. Very interesting here shows that the interactive learning media developed are suitable for use and proven valid, practical and effective.

After conducting small group trials and testing large groups to determine the attractiveness of developing electronic worksheet based on Adobe Flash cs6 for the seventh-grade students of junior high school on fraction material, the product was said to be of good attractiveness so it was not retested. Furthermore, electronic ads based on Adobe Flash CS6 can be used as one of the learning media for students and educators in junior high schools in seventh grade of fractions.

This research is the same as previous studies developing electronic worksheet in financial accounting subjects for class XI [9]. In addition, other researches developed electronic mathematics worksheet with Discovery Learning approach for junior high school students [10]. Then other researches developed an electronic smart worksheet to increase the interest in learning high school students [11-15]. Subsequent research developed worksheets with image media on accounting lessons for class X students of Vocational High Schools [12]. Then the next research develops worksheet in the subjects of engineering mechanics with a contextual approach for students of class X SMK [16]. Subsequent research develops inquiry-based worksheets for understanding the science concept of fifth-grade students [17]. The development of Adobe Flash CS 6 based Electronic Worksheets on the 7th grade junior high school material that has been developed by researchers has a difference with the research conducted by the researchers above which was drawn from the conclusion that the development of Adobe Flash-based electronic worksheet 6 is an application that contains many animations so that students are not bored with ordinary books, ordinary printed books that have no animation so students can learn while knowing, so that an atmosphere is active in the learning process. The hope for further research can develop E-worksheet by using Adobe Flash CS6 with a different design and combined with other supporting software that is different from the one already.

4. Conclusions and Suggestions
The conclusions obtained from this research and development are AdobeFlash CS 6-based Electronic worksheet Development on the 7th-grade fraction material developed by Borg and Gall which was modified by Sugiyono as feasible by material experts and media experts. Judging from the students' responses to interactive learning media developed, they obtained the criteria of 'Good'. Based on the above conclusions, the authors suggest that other researchers be able to develop Abode Flash CS 6-based Electronic worksheet on the fractions for the seventh-grade students of the junior high school in other material and are expected to other researchers so that other media can be developed with the frictional material.

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