
THE DEVELOPMENT OF MOBILE LEARNING MEDIA BASED ON ADOBE FLASH CS6 IN STATIC FLUID MATERIAL

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Abstract

This research was motivated by the lack of interesting learning media innovations available for physics lessons, therefore a questionnaire was distributed and it was found that static fluid material is one of materials that is difficult for students to understand. This research aims to find out how to develop, analyze the feasibility and level of effectiveness of the mobile learning media based on adobe flash cs6 in static fluid material. The research was conducted using Research and Development with ADDIE (Analysis, Design, Development, Implementation and Evaluation) models. Respondents in this research were class XI IPA 6 students at SMAN 2 Medan. The product testing consists of small group test and large group test. Small group trials involved 10 students, and large group trials 30 students. The instrument used in this research were expert validation questionnaires, teacher validation questionnaires and determine the effectiveness of learning media by giving posttest question to students. At the validation stage of the result of the media expert assessment, the average percentage is 93,84% with a very decent category and result of material expert assessment get an average percentage 98% with a decent category. The result of the assessment of the physics teacher response 91,53%. The result of the learning media effectiveness test given to small and large groups get an average percentage of 70% and 86,66%. This shows that the media developed is very feasible and effective as learning media in learning activities.

Keywords: Development of learning mobile learning, based on Adobe Flash CS6, Static Fluid

The developed mobile learning media based on Adobe Flash CS6 is expected to: increase the interactivity of the Mobile Learning Media and students so that it can be seen the level of students' abilities when studying independently, the resulting mobile learning media can help students to train and improve critical thinking skills by providing practice and evaluation questions along with answer keys with indicators of critical thinking skills, providing appropriate mobile learning media based on Adobe Flash CS6 needed by teachers and students so as to improve students' critical thinking skills. These characteristics are expected to be added value so that the resulting mobile learning media is feasible, and effective.

Based on problems encountered during observation, the researchers are interested in conducting research "The Development of Mobile Learning Media based on Adobe Flash CS6 in Static Fluid Materials" which aims to determine the level of validity, and effectiveness of Mobile Learning Media based on Adobe Flash CS6 on Static Fluid materials in improving student learning outcomes.

METHOD

Research Methodology

This research was conducted at SMA Negeri 2 Medan. The population in this study were all students of class XI IPA SMA Negeri 2 Medan T.P. 2022/2023. The sample in this study was students of class XI IPA 6 SMA Negeri 2 Medan, and the sample was selected randomly using purposive sampling.

This research uses a type of research and development method (Research and Development). The development model used is the ADDIE model. This development model is divided into Analysis, Design, Development, Implementation, and Evaluation. The instruments used in this study were non-test instruments in the form of material expert validation sheets, media expert validation sheets, response questionnaires for students and educators and test instruments in the form of essay questions. Data analysis techniques used qualitative data analysis techniques that describe the results of product development, namely mobile learning media based on Adobe Flash CS6 in static fluid material.

1. Validation by validator (Validity)

The instrument used a Likert scale of 1-4 with the highest score of 4 and the lowest score of 1. To determine the value of validity by using the formula:

$$P = \frac{\sum f}{N} \times 100 \% \quad (1)$$

Information:

P = Category Presentation

f = Number of answers in the selected category

N = Total score

The results of the assessment scores from each validator are then averaged and converted to questions to determine the validity. The conversion of these scores into assessment questions can be seen in Table 1.

Tabel 1. Mobile Learning Validity Percentage Criteria

Percentage Interval	Criteria
$x \geq 80\%$	Very Valid
$60 \leq x \leq 80\%$	Valid
$20 \leq x \leq 40\%$	Invalid
$0 \leq x \leq 20\%$	Very Invalid

2. Test the Effectiveness of Teaching Materials

Indicators of research development with modules are said to be effective if statistically descriptive student learning objectives are achieved. The Average Profit Index shows this the difference between the small group and large group test. According Widoyoko (2016), to determine the value of validity by using the formula:

$$P = \frac{\sum f}{N} \times 100 \% \quad (2)$$

Information:

P = Category Presentation

f = Number of answers in the selected category

N = Total score

The conversion of these scores into assessment questions can be seen in Table 2.

Table 2. Mobile Learning Effectiveness Percentage Criteria

Interval	Category
$\geq x80\%$	Very Effective
$60 \leq x \leq 80\%$	Effective
$40 \leq x \leq 60\%$	Effective Enough
$20 \leq x \leq 40\%$	Less Effective

RESULT AND DISCUSSION

Result of Research

This research was carried out with the aim of developing an mobile learning media product that can be accessed offline. This type of research is research and development using a ADDIE development model that has five stages which is Analysis, Design, Development, Implementation, and Evaluation. This mobilr learning media is an electronic media based on Adobe Flash CS6 on Static Fluid materials class XI made with the help of the application Adobe Flash CS6 Professional that meets the criteria valid and effective so that the mobile learning media is worthy to be used in learning activities. Activities carried out at the analysis stage are conducting studies introduction to school consisting of 5 steps, namely a) front end analysis; b) student analysis; c) task analysis. At the design stage, the activities carried out are:

1. Selection of Material

The material arranged in the mobile learning media with the help of Adobe Flash CS6 Professional is based on the 2013 curriculum syllabus in accordance with the curriculum used in SMA Negeri 2 Medan. The source material and sample questions used as references in this e-module are taken from several books.

2. Selection of Format

The selected format, starting from the background used in compiling the mobile learning media on fluid static, is used from canva on internet. The font used is Roboto with a font size of 12 pt. The title uses the font Spartan League and the subtitles use the Sunborn font size of 14 pt. In compiling this mobile learning media used tools of Adobe Flash CS6, then converted into a swf and continued by using bluetooth to share the apk. The mobile learning media consists of the following components:

- a). Front cover
- b). Preface
- c). List of contents
- d) KI, KD, indicators
- e) Learning objectives
- f) vidio
- g) Reflections
- h) Summary, glossary, bibliography and author profile.



Figure 1. Cover the front and back of the media

2) Results of Draft 1 mobile learning media

In this activity the researcher arranges student material and activities into the layout design that has been made. Making mobile learning media is done with the help of the Adobe Flash CS6 Professional application.

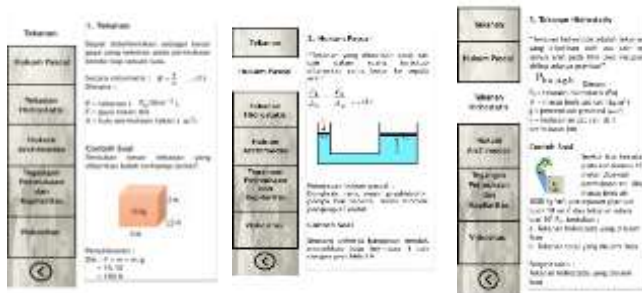


Figure 2. Draft of mobile learning media on fluid static

Activities at the development stage consist of :

1. Validation Results

The validity test was conducted on 2 validators (physics lecturer at Medan State University), including material experts and media experts. The validators who carry out validation in this mobile learning media are Abdul Rais as a media expert and Juniar Hutahaean as a material expert. The results of the mobile learning media validation can be seen in Table 4 and Table 5

Tabel 4. Media Expert Validation Results

Aspect	Percentage	Category
Functionality	90.90%	Very Valid
Reliability	100%	Very Valid
Usability	96.66%	Very Valid
Efficiency	90%	Very Valid
Maintability	93.33%	Very Valid
Probability	100%	Very Valid

Tabel 5. Material Expert Validation Results

Aspect	Percentage	Category
Content	98.18%	Very Valid
Presentation	96%	Very Valid
Graphics Feasibility Aspects	100%	Very valid
Languange Feasibility	100%	Very valid

Suggestion from material expert validator is the concept/principle of the practical work is not quite right, fix it to be more correct. Suggestion from media expert validator is create an equation number in each formula and make a summary of each material in the learning activity.

3. Effectiveness Results

The level of effectiveness of the mobile learning media in question is to see student learning outcomes in the cognitive aspect. At this stage, a small group was carried out to know if there problem when student use the media. The small group and large group were carried out using the same 10 essay questions in class XI MIA 6 SMA Negeri 2 Medan with a total of 30 students. The small group were attend 10 students and large group were attend 30 student in class XI MIA 6. Result from small group there are 7 from 10 student got completed and from large group there are 26 from 30 students got completed the test. Presentation Based on the calculations from small group got 70.00% and large group got 86.66%. This shown the media developed is very effective in learning activities.

Discussion

The implementation of research on The Development of Mobile Learning Media Based on Adobe Flash CS6 in Static Fluid was carried out at SMA Negeri 2 Medan. Those involved in this study were 30 students of class XI MIA 6. This research was conducted in ADDIE model, namely the analySis stage, the design stage, the development stage, the implementation stage and the evaluation stage. This study has 2 objectives, namely (1) To find out the level of validity of media learning based on adobe flash cs6 on fluid static fluid for class XI at SMA Negeri 2 Medan (2) To find out how effective the level of learning effectiveness of the media learning based on adobe flash cs6 on fluid static for class XI at SMA Negeri 2 Medan.

The first objective of this study was to obtain a validation test by a team of experts consisting of media experts and material experts on mobile learning based on adobe flash cs6 on fluid static. The first stage for the validation test is the materi validation test. Based on media experts, the mobile learning that has been developed by researchers can be stated that: 1) the functionality aspect of the content is worth 90.90% (2) the reability aspect is worth 100% (3) the usability 96.66% (4) the efficiency is worth 90% (5) the maintability is worth 93.33% (6) the probability is worth 100%. The average value of the media expert validator's assessment is 93.84% with a very valid category. This means that the developed electronic physics teaching materials have met the presentation, aspects of the mobile learning method so that it can be concluded that the developed electronic physics teaching materials using Adobe Flash CS6 are tested designs.

The second objective of this study was to determine the effectiveness of mobile learnig media based on adobe flash cs6 on the subject matter of fluid static in physics learning that the researchers developed. The use of e-module teaching materials is said to be effective if learning results increase in learning (Widoyoko, 2016). The results of calculating the score test from the knowledge aspect of student learning outcomes has a score of 70.00% from small group and 86.66% from large groupa. From the results of some of these students shows that the media developed is very effective as learning media in learning activities.

CONCLUSION

Based on the results of the research and discussion that have been described, the conclusions obtained in this study are as follows:

1. The development of learning media based on adobe flash cs6 in static fluid material is carried out using the help of the Adobe Flash CS6 apk with the tools in the apk.
2. The development of mobile learning media based on Adobe Flash CS6 in static fluid material, at the validation stage the media got an average percentage of 93.84% in the very feasible category and material validation got an average percentage of 98% in the very feasible category. And the validation results by the physics teacher obtained a percentage of 91.53% in the very appropriate category. This shows that the Adobe Flash CS6 based mobile learning media developed meets the feasibility criteria and can be used in the field for learning activities.
3. The development of mobile learning media based on Adobe Flash CS6 in static fluid material in the effectiveness test getting an average percentage of 70% in the effective category for the small

group test and getting an average percentage result of 86.66% in the very effective category for the large group test. This shows that the result of the effectiveness test of mobile learning media based on adobe flash CS6 got the media criteria and the effectiveness of the media is categorized as very effective.

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