Computer Animation with Adobe Flash Professional Cs6 in Newton’s Law

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Abstract. The purpose of this research is to develop computer-based physics learning media with Adobe Flash Professional CS6 on Newton’s Law of physics subject for senior high school (SMA / MA) class X. Type of research applied is Research and Development with ADDIE development model covering 5 stages: Analysis (Analysis), Design (Design), Development (Production), Implementation (Implementation) and Evaluation (Evaluation). The results of this study were tested toward media experts, media specialists, physics teachers, and students test results with media outcomes that are declared very feasible.

1. Introduction
Newton's Law learning is one of the topics that require a learning medium because in the topic of Newton's Law there are many sub topics which cannot be observed directly by the five senses [1]. One of the examples is the concept of inertia and style depiction acting on an object such as static and kinetic friction [2]. In describing the concepts in conventional learning, such illustrations or drawings are sometimes less clear and hard to imagine that turn out less attractive to students.

The programming of physics education software in Adobe Flash has often been developed [3] because Adobe Flash is easy to learn even for those who do not have prior knowledge in programming languages. In addition, the most intriguing Flash feature is its powerful graphics capabilities that are not available in other standard programming languages [4].

The use of adobe flash media is very effective in learning [3]. This can be seen from the increased motivation when using computer media [5]. Besides, the use of flash media makes it easier for teachers to give understanding of the theory to the students [6].

2. Methods
The type of research applied is the type of Research and Development (R&D). The model used in this development research is the ADDIE model. This model is selected because it is very suitable for developing computer-based learning [7][8].

The design of this study refers to the ADDIE development model which includes 5 stages as follows: 1) analysis; 2) design; 3) development; 4) implementation; and 5) evaluation. Flowchart of Newton's Law learning media can be seen in figure 1.
The applied menu design in this instructional media displays the icon as a button. The design of the selected menu is needed to simplify and attract the sympathy of users to use computer-based physics learning media. The overall menu design in this instructional medium can be seen in Figure 2.

Figure 1. Flowchart of Newton’s Law Computer-Aided Instructional Media

Data analysis technique is done by applying quantitative descriptive analysis technique. It was done by analyzing quantitative data obtained from media expert questionnaire, material expert questionnaire, teacher questionnaire and student questionnaire.

3. Results and discussion
This media was tested to media designers, physics learning experts, physics teachers and student respondents using questionnaires. The test of high school teachers and the test of student respondents were done after the test of media designers and physics learning experts.
There were 20 questionnaires that were divided into five criteria as follows 1) material truth, 2) depth and width of material, 3) language used, 4) media display and 5) implementation. In each criterion there were a number of different question items. On the material criterion, out of the four items of questions given, three of them have been declared very feasible and there is only one item that has feasible criterion. The second assessment of the criteria of depth and width, out of the six items of questions, five items have feasible criteria, and one has a very feasible criterion. In the third assessment of the language criterion, there are two items with very feasible and feasible criteria. The fourth assessment of the media display criteria consists of six question items with four question items that have feasible criteria and two questions have very feasible criteria. The last assessment was on the implementation criteria that consist of two items of questions with reasonable criteria.

Based on the results of questionnaire analysis from media experts, material experts, physics teachers and students, the average score can be obtained as follows.

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\text{Average score} = \frac{87.13\% + 61\% + 91.66\% + 81.59\%}{4} = 80.345\%
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The results of the questionnaire analysis yielded a percentage of 80.345% which is categorized as very feasible. Thus in terms of the developed display and technical learning media, it is feasible to be applied as a medium of physics learning on the topic of Newton's Law for high school. Utilization of computer media is very effective for learning [9][6]. It can also increase students' motivation to follow the learning activity [10].

4. Conclusion
The development of computer-assisted learning media with adobe flash CS6 professional on Newton's Law topic can be done based on the development steps of the analysis of the teaching material needs, designing the framework of learning media program content, creating learning media program, trials on material experts, media experts, physics teachers, and students, then the media revision for widespread use as one of the learning media of physics.

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