The Development of Instructional Media on Physics Subject To Increase The Class Effectiveness

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Abstract - **This research is aimed to develop the instructional media by using adobe flash in the Physics subjects on vocational school in Surabaya. Furthermore, the purpose of this research was to obtain a description of the quality of instructional media are applied to the Physics course, the effectiveness of media-based learning e-learning are applied to the Physics course, and the student response against media developed by researchers. The result of this research and development is a product of instructional media using Adobe Flash Maker. Subjects were studied in the learning media is the magnetic field, the ampere's law, Faraday's law, and the nature of magnetism .**
The method used in this research is the Research and Development (R & D). However, in this research, the method of R&D are modified by researchers into five steps of research and development.
The results showed that the learning media in the Physics was stated percentage of good quality by experts validation to 89.5% of the media so that the media was declared unfit for use as a medium of learning Physics subjects. To study the effectiveness of using the media, the percentage of results obtained matter expert rating is 86%, so it is very effective instructional media used in teaching Physics. As for the response of students to instructional media are obtained a percentage of 90.6%, It showed a positive response or very good, so the instructional media can be used in teaching Physics .

Index Terms – Instructional media, Research and Development Methode, Student Response

I. INTRODUCTION

Education is one of the most important needs in human life. Education itself is one aspect of a dynamic manifestation of human culture, in which human culture as a culture-laden means to development [1]. This development could not be separated from the cultural changes of human life, as well as the use of information and communication technologies (ICTs) in everyday life. Studying is to develop new knowledge, skills, and behaviors that constitute the interaction of individuals with the information and the environment [2]. Environment in this case is not only soft, but also a physical nature, such as highways, television, computers, and so forth. Looking at the definition, it became clear that learning could not be separated from an interaction between the individual and his environment, with a medium of learning is achieved information aimed at the individual.

With the medium of learning, learners can easily understand what the material content of the lesson. This is consistent with the definition of instructional media itself. As noted by Briggs [3] that learning is a means of physical media to deliver content or learning materials, such as books, movies, videos and so on.

In practice, Kemp & Dayton [3] grouped into eight types of media, ie print media, display media, overhead transparancies, audiotape, slides and movie series strips, multi-image presentation, video and film footage of life , as well as computers. While the application of today's technology, that the media

which covers almost all types of media is the implementation of e-learning medium.

Based on the student of The State Vocational School 5 in Surabaya , facilities to support the procurement of media learning has been developed , but the implementation was still not maximized . Learning that delivered still tend to use conventional instructional media such as notes from the blackboard and presentation using Power Point , It was less effective and interactive because there were no moving images . Especially in subjects Physics , which essentially requires understanding not only fixated on the media that had used images (non multimedia) but it was need a subject that required a simulation tool or magnet which can represented the magnetic flux that could not be seen by the human eye significantly . The learning material had presented so tend to be boring and less effective for students to understand the subject matter of the first physics course .

By implementing learning media based to the students are expected to media learning can be directly accessed easily by students anywhere in the form of instructional media applications on a PC or notebook, and can improve the students' understanding of the course Physics I magnetism. Nowadays more and more computer programmers to develop software provider of instructional media application making it. Among them is software Adobe Flash. With software that educators can use to its full potential in the context of preparing lessons that will be taught to students.

Based on the description above , the formulation of the problem that can be taken are: how is the quality of instructional media based on e-learning applied to the course Physics based media expert, how the effectiveness of media that were applied to the Physics course according to matter experts , and how the response of students to intsructional media based that were applied to that course .

A. Instructional Media

Different types of educational experiences exist - from hands-on apprenticeships to role-playing, from demonstrations to reading printed text. Some educators believe that different experiences are more or less effective for achieving different types of instructional outcomes. For example, text with pictures is not as effective as live demonstrations for teaching motor skills. As a rule, educational experiences that involve the learner physically and that give concrete examples are retained longer than abstract experiences such as listening to a lecture. Instructional media help add elements of reality - for instance, including pictures or highly involved computer simulations in a lecture [8].

Multimedia is defined as the combination of various digital media types such as text, images, sound and video, into an integrated multi-sensory interactive application or presentation to convey a message or information to an audience. In other words, multimedia means “an individual or a small group using a computer to interact with information that is represented in several media, by repeatedly selecting what to see and hear next”.[10]

The power of multimedia lies in the fact that it is multi-sensory, stimulating the many senses of the audience. It is also interactive, enabling the end users of the application to control the content and flow of information. This has introduced important changes in the educational system and impact the way we communicate information to the learners

II. METHODE

Research to be carried out are research based instructional media development. The research method used is a kind of method of research and development (research and development (R & D)). The research and development, is a research method used to develop or validate the products are used in education and learning [4]. Media research development is implemented in State Vocational School in Surabaya. The population of this research is State Vocational School in Surabaya The sample was State Vocational School 5 surabaya.

Furthermore, there are four main characteristics of research and development, namely: (1) studying the results of studies related to the product to be developed; (2) developing products findings; (3) testing area that it would be used later; (4) and revising to correct deficiencies found in the field trial stage [5]. By virtue of the characteristics research and development, there are ten steps according to Borg and Gall's research (1983) described as follows: (1) research and data collection; (2) planning; (3) development of a draft product; (4) the initial field trials; (5) revise the test results; (6) the trial court; (7) improvement of product field trial results; (8) the implementation of field trials; (9) improvement of the final product; (10) dissemination and implementation. Having described the research and development steps according to Borg & Gall.

in this study summarized the steps into a five-step procedure of research and development of e-learning media as arranged in Figure 1. below.

For data collection techniques , researchers used an instrument validation sheet and questionnaire responses of students . In the development of this research , there are two kinds of validation sheet . The validation sheet to test the feasibility and effectiveness of e-learning media . For the assessment of the feasibility or quality media , researchers used pieces of validation in which there are aspects of the quality of e-learning media . In this case , the validator or reviewers for quality media is a media expert . As for assessing the effectiveness of the media , researchers used a validation sheet in which there are aspects of the effectiveness of e-learning media . In this case , the validator or an expert reviewers for the effectiveness of media material , due to the achievement of a learning effectively , then the media should be in accordance with the instructional goals of learning . While the use of this questionnaire aims to find out how much the student response to the learning media is applied to students . While the techniques of data analysis, researchers used rating scale. According Sugiyono (2011: 97) rating scale is a numeric rating scale were then interpreted in a qualitative sense. Instrument rating scale with the scale must be able to interpret any given number of alternative answers to each item on the instrument

In the assessment sheet media expert validation to measure the feasibility of the media, researchers used a rating scale with categories of validation as shown in Table 1. Meanwhile, the feasibility of the media to interpret scores can be seen in Table 2.

TABLE 1.
CRITERIA VALIDATION LEARNING MEDIA ASSESSMENT OF E-LEARNING (EXPERT MEDIA)

t criteria	ue

Meanwhile validation of expert assessment sheet material to measure the effectiveness of the media, researchers use category rating scale with validation as shown in Table 3. While to interpret scores of media effectiveness can be seen in Table 4.

TABLE 3.
CRITERIA VALIDATION LEARNING MEDIA ASSESSMENT OF E-LEARNING (EXPERT MEDIA)

t criteria	ue

TABLE 4.
INTERPRETATION EFFECTIVENESS SCORE

	/ Very Not Effective
	t Effective
	ffective Enough
	ective
%	g/ Very Effective

(source Riduwan, 2013: 22)

Furthermore, the assessment of the level of student response to the e-learning media, researchers use category rating scale with an attitude scale as shown in Table 5. Meanwhile to interpret scores student responses to the media can be seen in Table 6.

TABLE 5.
CRITERIA ASSESSMENT QUESTIONNAIRE RESPONSE TO THE MEDIA STUDENT LEARNING E-LEARNING

ent criteria	alue
Disagree	

agree	

(source Sugiyono, 2011: 120)

TABLE 6.
INTERPRETATION STUDENT RESPONSE

0% - 25%	
26% - 50%	ood
51% - 75%	
76% - 100%	

(source Riduwan, 2013: 22)

The quality e-learning media consists of the aspects of ease of operation, integration aspects, aspects of balance, and aspects of media form. Form validation in general to the variable quality of e-learning media, it can be seen the average percentage is 89.5% of media quality. It was mean that e-learning media had a very feasible quality according to expert judgment. Furthermore, the description of the quality of media can also be shown in the graph in Figure 2

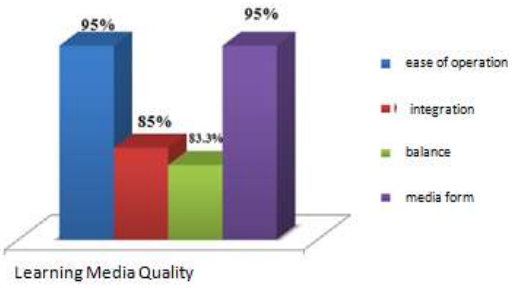

Figure 2. Instructional Media Quality

Effectiveness of e-learning media consists of the format and content of the media that was in compliance with the purpose of learning materials on physics I. From the results of the validation assessment in general to the variable effectiveness of e-learning media, it can be seen the average percentage of media effectiveness was 86%. This shows that e-learning media had very effective interpretation rating scale according to expert assessment . Furthermore, the description of the effectiveness of e-learning media can also be shown in the graph in Figure 3.

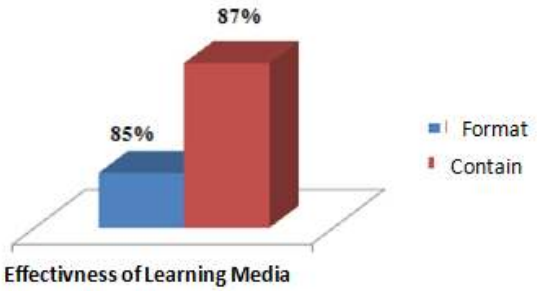

Figure 3. Effectiveness of Instructional Media

As for the results of the percentage of student responses to the media e-learning, an average large student response assessment of some aspects of media, such as media format, media content, media language used, the ease of operation of the media, and student attitudes towards the use of instructional media e-learning. The average percentage of each aspect got response rate of 90.6%. This means that e-learning media are in very good criteria for student response. Furthermore, the description of the results of student responses to the e-learning media can also be shown in the graph in Figure 4

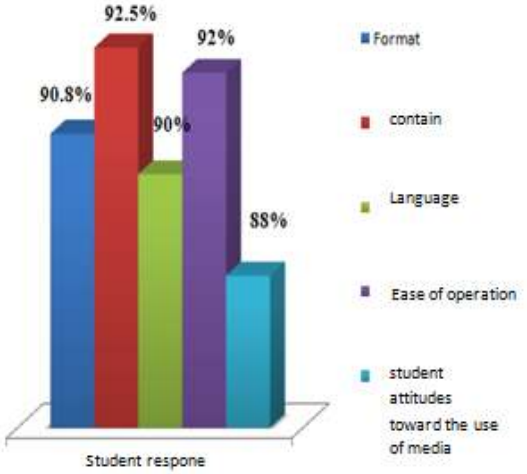

Figure 4. Student Responses Against Instructional Media

III. CONCLUSION

Based on the research problem formulation, there are three conclusions, namely: (1) based on the study conducted by media specialists, instructional media developed by researchers gain medium quality overall percentage of 89.5%, which means that the media has a very good quality and worth to used as a medium of learning Physics on Surabaya State Vocational School ; (2) the results of the validation are performed by experts materials, instructional media developed by researchers obtained a percentage of 86% effectiveness of the media, which means that e-learning media very effectively used in teaching Physics ; (3) Student response to the e-learning medium showed a very good response. This

can be shown by the results obtained from the percentage of student responses at 90.6%.

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