THE DEVELOPMENT OF INSTRUCTIONAL MEDIA BASE ON E-LEARNING TO INCREASE THE CLASS EFFECTIVENESS IN VOCATIONAL HIGH SCHOOL

by Puput Wanarti

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Hapsari Peni[1], *Puput Wanarti*[2], *Euis Ismayati*[3], *Yuni Yamasari*[4]
Elctrical Engineering Department, Unesa, Surabaya
hapsaripeni@unesa.ac.id
puput_wr@yahoo.com
euisheru@gmail.com
yamasari2000@yahoo.com

ABSTRAC: *Education is one of the most important requirements on thuman life. Education itself is one aspect of dynamics human culture, as well as the use of information and communication technology (ICT) can not be separated from cultural changes of human life in everyday life. In achieving a balance of education and technology collaboration, necessarythe transformation of an aspect of learning in education today, as well aswith the development of media-based instructional and communication technologyinformation. By implementing a media-based on e-learning to students, it is expected that e-learning is directly accessible by students anywhere in the form of learning media applications on a PC and notebooks. In addition, e-learning will be built with responsive web deasign. It will be mobile and can be accessed by mobile devices (and ultimately to enhance students' understanding on Physics Subjects. This media is mobile learning with the adoption of responsive web design techniques developed by the modern web markup language HTML5 and style formatting pages with CSS3 by utilizing supporting features pages in both languages. The instructional media validated by media experts, media based on e-learning developed have good quality, very decent and very effective for use as instructional media to learn physics onVocational School. student response to this instructional mediashowed a positive response. Based on this it can be concluded that the e-learning media is best used asphysics learning media in Vocational School in Surabaya.*
Keywords : Instructional Media, E-Learning, responsive web design, student response

I. INTRODUCTION

According Smaldino[8] learning is to develop new knowledge, skills, and behaviors which is the interaction of individuals with the information and the environment. Environment in this case is not only soft skills, but also be hard skills, such as highways, televisions, computers, and so forth. According to the definition. Learning can not be separated from an interaction between the individual and the environment. Information will achieved completely by the help of Instructional media.

Even though e-learning is relatively new, its concept has been around for decades. E-learning was the training method applied in the internet or a company's intranet system. It began in the early 1980s with the use of CD-ROMs to teach technical skills. Nowadays e-learning is used widely in the education and corporate world. The application of e-learning through Information and Communication Technology (ICT) is also vital in the planning of a nation's economy in the k-economy perspective. K-economy emphasizes in the application of knowledge and aptitude and not by looking at physical product such as agricultural and industrial goods per say. In other words, keconomy is based on highly knowledgeable workforce, which includes adaptation of new values and efficiency in place of traditional ones. Services are directly brought to consumers thus cheaper, more flexible and convenient[3] .Apart from using Local Area Networking (LAN) and Wide Area Networking (WAN) in

transmitting content and interaction, e-learning also utilizes electronic media such as the interactive internet, intranet, audio and video tapes, the television and CD-ROM. Teaching could be done synchronously and asynchronously by utilizing texts, animation, simulation and audio-visual material. But an important part is that elearning must also provide adequate channel for discussions and professional support on-line. Learnframe[6].According to Rossernberg[7], defines e-learning as "the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance". Rosenberg also states that different organizations define elearning in various ways and this is usually a reflection of the organization's e-learning direction. However, Rosenberg emphasizes that e-learning is much more than online training or computer based training. It also encompasses knowledge management and electronic performance support.

The focus of e-learning is the learners. They are given the freedom to learn independently, according to their pace and time, therefore giving more autonomy and responsibility to the learners. This could bring to a more interactive and active leaner. Learners will have to plan and prepare thoroughly by searching materials and information regarding a topic with their own initiative. It allows self-learning to happen, revisiting difficult topics repeatedly and most of all allowing learning to happen without embarrassing oneself in front of their colleagues. Questions could be posted on-line[5]

Based on preliminary studies on students in voctional high school in Surabaya, facility to support the provision of e-learning has indeed been developed, but the implementation is still not optimal. Knowledge is delivered still tend to use conventional learning media such as notes from the blackboard and media presentation software such as PowerPoint. The utilization of information technology is still less effective and interactive because there are no moving images.

By implementing instructional media based on e-learning,it can be easily accessed by students anywhere in the form of instructional media applications on a PC or notebook. In addition, e-learning built using responsive web techniques that can also be accessed by mobile devices (such as smartphones) and ultimately to improve the understanding of students in the Physics lessons about magnetism

II. METHOD

This research employed a research and development approach, and it was intended to develop the e-learning media for Vocational Competency Basics learning in vocational high schools..The method to be used is the type of research and development methods (research and development (R & D)). The development model employed in this research was the result of the integration of multimedia development modeled by Alessi& Trollip [1]. This research and development had produced: (1) e-learning media using responsive web design as its base for Vocational Competency Basics learning, (2) tutorial book on how to use e-learning media for the teacher and the student, (3) Vocational Competency Basics learning instrument set.

The subjects of the experimentation were the students in Grade X, majoring in Civil Engineering, Building Drawings Program. The subjects of group experimentation were students in State Vocational

High School Number 5 of Surabaya. The data of the research were gathered through primary and supporting instruments. The former was the assessment sheet (questionnaire) for the hybrid-learning product. The questionnaires used were: (1) the questionnaire for the media experts encompassing three aspects namely the aspects of display design, interaction design, and information design; (2) the questionnaire for the material experts including two aspects, namely pedagogical and content correctness; (3) the questionnaire for students and teacher as a product users, in order to get the formative evaluation of the product that had been developed. Their validity and reliability on this research and the development of the e-learning media development were reached in two ways: logical theoretical validity and reliability, obtained by asking for the expert supervisors', material experts', and media experts' justification (criticism, suggestion, and revision) on the hints and instrument items that had been composed by the researchers. Those instruments were questionnaire, note sheet, observation guide, and interview guide; The data gathered in this research were: (1) the data of the need analysis of vocational competency basics material and the criteria of hybrid e-learning media; (2) the validation of the material experts' appraisal; (3) the validation of the media experts' appraisal; (4) the data of student responses upon applying the e-learning product; The types of the compiled data were the quantitative data using scoring scale as the main data.

III. RESULT

The result of this research is e-learning media web design using responsive web design. The technique that used for responsive wb design was flexible grid layout, flexible images, and media queries. E-learning media built with responsive web design suported using modern web markup language and CSS3 page style format. The result of e-learning media using responsive web design showed bellow

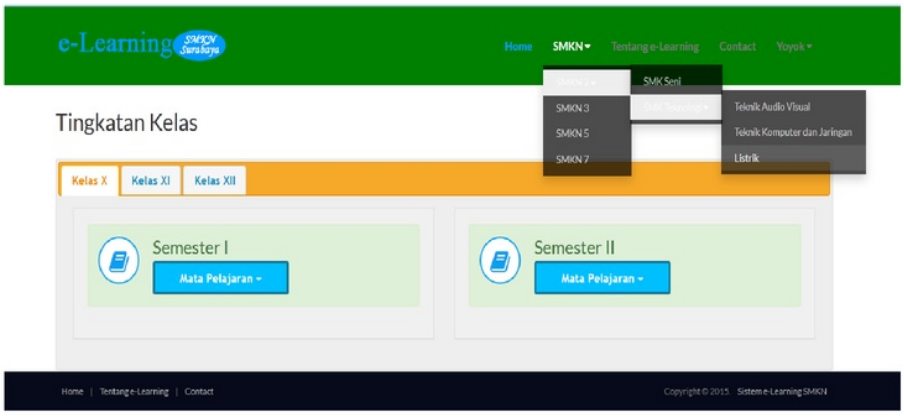

Fig 1. E-learning media on Personal computer

Fig 2. E-learning media on Smart Phone using responsive web design technique.

This study aims to produce instructional media e-learning in the subjects of Physics at SMK Negeri Surabaya. Prior tested by a student of SMK Negeri 5 Surabaya, media validated by media experts and matterial experts. Three aspect developed through media validation; (1) ease of operation, (2) integration of media, (3) balance of media, (4) form of media. The result 96,25% show that intepretation of media experts is "very valid" for the first aspect. The table that describe validity aspect show bellow

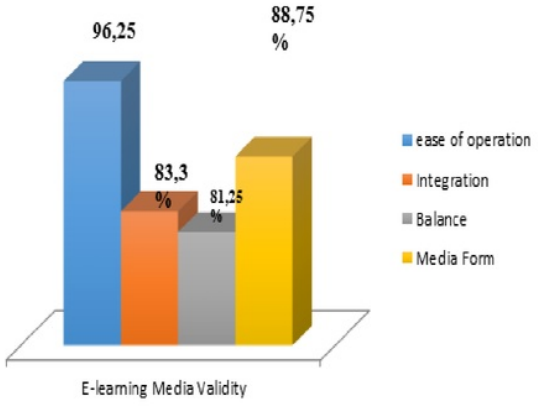

Fig3. E - Learning media Validity Diagram

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 3

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 Figure4.

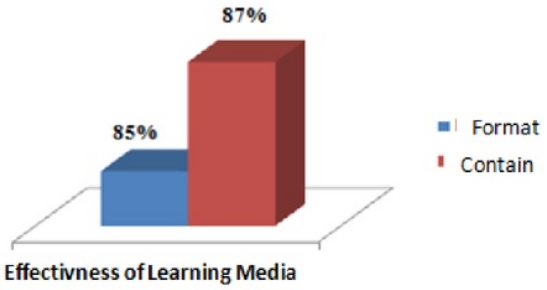

Fig4.. Effectivenessof Instructional Media

As forthe results ofthe percentage ofstudentresponsesto themediae-learning, anaveragelargestudent responseassessmentof some aspectsof media, such as media format, media content, medialanguage used, the ease ofoperation ofthe media, andstudentattitudestowardsthe useof instructional mediae-learning. The averagepercentageof eachaspectgot response rate of90.6%. This meansthate-learningmediaare inverygoodcriteriaforstudentresponse. Furthermore, the description ofthe results ofstudentresponsesto thee-learningmediacan also beshown inthe graphin Figure6

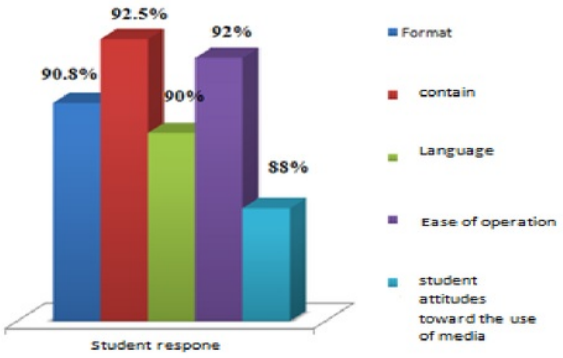

Fig5. Student Responses Against Instructional Media

IV. 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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