Practicality of E-Learning as Learning Media in Digital Simulation Subjects at Vocational School in Padang

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Abstract. This development research produces learning media in the form of E-Learning which is applied to digital simulation subjects at Vocational School in Padang. This E-Learning could improved student learning outcomes on digital simulation subjects. Research and Development (R and D) was used as research methods with Four-D development procedures (Define, Design, Develop, and Disseminate). The type of data that used in this research was primary data. This research used descriptive data analysis techniques by describing the practicality of E-Learning as learning media. The results obtained from this research was the results of the practicality test E-Learning as learning media which are based on the responses of teachers and students in digital simulation learning. The practicality test result shows that E-Learning as learning media has high practical value. Based on the result of the research it can be concluded that E-Learning as learning media is practical for use by teachers and students.

1. Introduction
Learning media could be in the form of print out media or media that utilize information and communication technology. The learning process is also a communication process and takes a place within system, so that it can be said that learning media is very important in the learning process [6]. From the statement it was concluded that learning media is an integral component of the learning system. Learning media can also be said as everything that is used to delivered the messages and can stimulate thoughts, feelings, attention, and urge of students so that it can encourage the occurrence of a deliberate, purposeful, and controlled in the learning process.

In learning activities, a teacher should used learning media such as modules, jobsheets, models, or others which can help students understand the learning course easily and provide concrete experiences [2]. Teaching media or learning media also began to develop in accordance with current technological developments. In several schools the teachers delivered the learning course by utilizing technology such as Microsoft Office, for example Microsoft Power Point. By using this media, the delivery of learning course could be more effective, efficient and interesting. However, this media has certain disadvantages, such as if the teacher was too focused on explaining the course using Microsoft Power Point could cause interactions between students and teachers would be reduced.

Based on the results of observations at vocational school in Padang, there are facilities and infrastructure that can support the learning process on digital simulation subjects in order to be a better. The facilities and infrastructure were practicum classrooms as well as the existence of computer
facilities equipped with internet, and also infocus. However, even though the facilities and infrastructure are quite good and adequate, the learning media which teachers used still using conventional learning media, such as the use of Microsoft Office Power Point media, print out media (modules and jobsheets). Print out media can cause problems for students, such as the frequent losses of print out media which teachers provided, making it difficult for the learning process. Also, the learning media that are currently used makes students feel bored and lazy, causing student loses interest in these subjects. This could be seen by the number of students who do not focus on learning activities, so that the percentage level of learning outcomes becomes low.

Based on the description of these problems, the E-Learning as learning media is expected to be able to overcome this problem, as well as improving the quality of student learning outcomes in digital simulation subjects. E-Learning as learning media was developed using the Four-D (4D) development procedure proposed by [13], which consists of four stages: Define, Design, Develop, and Dissemination. The 4D development procedure was chosen because this development procedure is the basis for developing learning devices, which is also the development of learning media, and the implementation stages in this development model are divided in detail and systematically, so that it fits the needs in the field.

This research focuses on Digital Simulation subject at Vocational School, the subject was choosen because it is a general course at Vocational School. The contents of Digital Simulation subject such as computer and its program, also included internet things. This courses could be uploaded into an E-Learning, and then let the students became independent by learning by themselves. The research also limited only to knowing how much the value of practicality of the E-Learning as learning media for vocational school. The purpose of this research was to 1) produce an E-Learning as learning media for vocational school at Padang, 2) increase student learning interests, 3) examine E-Learning in terms of practicality for vocational school at Padang.

2. Fundamental Theories
2.1. Learning Media
Learning media is one of the important elements in learning that can enhance the learning process, so that ultimately it is expected to improve learning outcomes [12]. Learning media has two main functions, such as media as a tool and media as a source of learning for students [3]. As a tool, learning media can be used to simplify the process of delivering information, accelerate understanding, increase students attention to the teaching courses. This statement is in accordance with the opinion of [11] in the theory of the Cone Experience. This media helps delivered abstract material that will appear to be real, such as by utilizing videos, animations, and other interactive techniques. As a learning resource for students, the learning media developed could be distributed or given access rights to students, so that with the help of these media, students can learn independently and use this media as a source of learning. The interface design of learning media is closely related to the condition of the interface itself. It should be noted that several things are the main principles of interface design. The design process is carried out by observing human characteristics and computer characteristics. The design principle can be seen in the following points:
- User Compatibility
- Task Compatibility
- Consistency
- Familiarity
- Simplicity

2.2. Utilization of Internet in Learning Media
The unique characteristics of the internet and their potential applications could be implemented in education [7]:
"The unique characteristic of the internet stem from its nature as a global information system. The internet has its root in connecting people to share ideas and information and connecting people with sites that store information. These are the reason for existence and tremedous growth."
The learning process could not be separated from utilization of the internet. This is adjusted to the development of technology and information in various parts of the world. For this reason, in the learning process, educators must be able to apply the internet as a media in learning [1].

2.3 E-Learning
E-learning refers to the use of internet technology or a series of solutions that could improved knowledge and skills. In this view, the definition of e-learning is emphasized on the utilization of internet technology [8]. E-learning basically has two types, synchronous and asynchronous [4]. From those two types of E-Learning, the development of E-Learning as a learning media is more suitable by using the type of Synchronous type, because the teacher and students were in the class together, and the teacher guides students using E-Learning to facilitate the learning process.

3. Research Methods
Research and Development (R & D) was used as research methods. The purposes of research and development were be able to produced certain products, including the process of examining the practicality of the product. The development model that used in this research was the Four D (4D) model. 4D model consists of 4 stages of development which is Define, Design, Develop, and Disseminate [9]. The E-Learning was produced for students of vocational school at Padang, in this matter, the samples was taken from Muhammadiyah 1 Vocational School which contains of 62 students of class XI.

Based on the flowchart above, the E-Learning was developed using the 4D model which explained as:
1. Define
   The first stage is the define stage which contains steps for background analysis and problem identification. Analysis and observation process included 1) observation of learning equipment which provided by school, 2) analysis of digital simulation courses, and 3) analysis of students characteristic.

2. Design
   The second stage is the design stage which contains designing learning media and the preparation of products prototypes.

3. Develop
   The third stage is develop which contains product validation which is the stage to produce product development which is carried out through two steps, expert appraisal followed with revision, and
developmental testing. To examine the practicality of the E-Learning, the technique which used to collected the data was in the form of a questionnaire with Likert scales. The questionnaire was derived from General Evaluation Guidelines for Educational Software by Forcier [10]. The questionnaire was validated by the experts before handing out for the teachers and students.

4. Disseminate
The fourth stage is the dissemination stage which is carried out to promote development products so that the products could be accepted by users, both individuals, groups, or systems.

4. Results and Discussion

4.1 E-Learning Design and Interface
- Login Page
  This page contains login form, each user could login into E-Learning with their username and password.
- Main Menu Page
  This main menu will appeared if the user login succeed. This page contains of the course overview, administration menu, navigation, and important information for student.
- Learning Course Page
  The learning course page was used to display all of the courses subject which student take. This page also could contains exercises for each subject, quizzes, and this page also could be used to collect the homework from the student. Each student could open only the course of subject which they take on.
- Grading Page
  The grading page was used to observed student’s activities which included how much they were login into the E-Learning, which course they did and also for checking their homework. The results of exercises or exam automatically could be seen as graphic or chart.

4.2 Examine of Practicality
To simplify the analysis of practicality data, the statements of respondents are converted into numbers, with the following conditions:
1 = Strongly Disagree
2 = Disagree
3 = Agree
4 = Strongly Agree

The conversion of the numbers then entered into the calculation formula as follows [5]:

Practicality = \[ \frac{\sum \text{Score each item}}{\text{Score Maximum}} \times 100\% \] ...............................................................................(1)

| Number | Achievement level (%) | Category          |
|--------|------------------------|-------------------|
| 1      | 81-100                 | Very practical    |
| 2      | 61-80                  | Practical         |
| 3      | 41-60                  | Practical enough  |
| 4      | 21-40                  | Less practical    |
| 5      | 0-20                   | Not practical     |

The examined results of the practicality E-Learning as learning media based on the teacher responses shows the total practicality value which contains the contents qualities, technical qualities, and learning qualities. The average of the practicality values states that the practicality of E-Learning is categorized as "Very Practical" with an average value of 88.66%.

The chart of practicality values from E-Learning based on teacher responses:
The examined results of the practicality E-Learning based on the responses of students shows the total value the total practicality value which contains the contents qualities, technical qualities, and learning qualities. The average of the practicality values states that the practicality of E-Learning is categorized as "Very Practical" with an average value of 81.19%. The chart of practicality values from E-Learning based on students responses:

![ practicality values chart]

**Figure 2.** Teacher’s Responses Assessment Chart

5. **Conclusion**

Based on the fundamental theories and supported by data analysis, the results of this research can be summarized as follows: Overall the examined of practicality value E-Learning as learning media is 88.66% based on the teacher and 81.19% based on the students, so that the practicality value could be interpreted as Very Practical to use.

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