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The Development of E-Learning Use MOODLE as A Multimedia Learning Medium

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Abstract. The success of a nation lies in the quality of education that can improve the quality of its human resources. We need human resources who can respond to the development of science and technology. There are many supporting factors to enhance the quality of education; one of them is the use of science and technology. One of the technology utilization in education is using E-learning as a learning medium. Using E-learning in vocational schools is very lacking. Therefore, it is necessary to develop an E-learning as a learning medium for a vocational school. This research aims to develop learning medium using Moodle as a development platform. We use Research and Development (R&D) as a development model. This study focusing on phase 4 (Design validation) of R&D model, two experts involved to validating this product. The results of the validation by experts show that the product qualifies for the next level, with a feasibility percentage of 74.33%.

Keywords: MOODLE, R&D, E-Learning

1. Introduction

The world of education is inseparable from the development of science and technology. To balance technological development, the world of education needs human resources who can respond professionally. These human resources must can understand the development of science and technology that requires critical thinking, systematic, logical, creative thinking, and the willingness to collaborate effectively to achieve quality education. Besides professional human resources, the use of information technology in education also requires media or a forum to support learning activities. One of technology use in education is the internet.

The internet can distance learning between educators and students in viewing schedules, sending school assignments, seeing grades, consulting, and even conducting discussions, so students can do it anytime and anywhere without having to meet with educators, and it will impact the form of learning media that will apply. We know the distance learning as e-learning [1] [2]. E-learning allows teachers and students to learn without having to meet physically, and it not restricted by time in conducting learning activities [3] [4] [5]. The development of e-learning can use various platforms [6]. One of them is Moodle (Modular Object-Oriented Dynamic Learning Environment).
Moodle is a brand name for computer systems creating and sharing educational materials online. As open-source software, it produces to support internet-based learning activities and websites that use social construct control pedagogy principles. This application allows users to enter digital classrooms to access learning materials. Besides, Moodle also has facilities to make learning materials, quizzes, electronic journals and others. Educators can observe objectively all student activities through the student record. Through Moodle, a teacher can give different learning form [6] [7]. Moodle can improve student learning outcomes, enhance flexible learning, enhance independent learning, and others [8] [9] [10] [11].

In several studies, the use of e-learning by vocational students and teachers in Indonesia in learning activities is still lacking. This case also happened at SMKN 1 Sikur, especially in the major of multimedia. Limitations that occur during learning include 1) teachers find it challenging to deliver subjects without supporting media, 2) students are not focus, even though learning activities have been running for a while, 3) lack of variation in teaching methods, more lectures, 4) students difficult to understanding the material presented by the teacher because of lack of focus and saturation, 5) the availability of facilities and infrastructure is adequate, but not appropriately used.

2. Method
2.1. Development model
This study using Research and Development (R&D) as a development model. R&D has ten phases; problem & potential, data collection, product design, design validation, design revision and product development, product testing, product revision, implementation, product revision, and product installation [6] [12] [13] [14]. It can show in Figure 1 below:

![Figure 1. Research and Development phases [12]](image)

2.2. Participant
This study focused on phase 4: design validation by expert. In this phase, we involved two experts. The experts will provide an assessment of the product through questionnaire to ensure it meets common guidelines.

2.3. Data Collection
To aim the research purpose, the data of the study divided into three different aspects as a variable on the questionnaire. Three aspects of the experts are Usability, Functionality, and Visual Communication.
2.4. Data Analysis
The data collected from the questionnaire will quantitatively analyzed. Besides descriptive statistics, we submitted the data from the experts to a calculation formula to examine whether the product is eligible. The calculation formula used is the percentage of eligibility [15]:

\[ P = \frac{\sum x}{\sum x_i} \times 100\% \]

Where,
- \( P \) = percentage of eligibility
- \( x \) = total scores of respondents’ answers
- \( x_i \) = total scores of ideal scores per indicator

To determine qualitative criteria, we determine them in the following ways:
- Determine the ideal score (maximum score) = 100%
- Determine the lowest percentage (minimum score) = 0%
- Determine range = 100 - 0
- Determine the interval = 4
- Determine the width of the interval = (score max / number of intervals) = 100/4 = 25

Based on the calculation above, we specify the range of qualitative percentages and criteria in Table 1. below:

| Percentage Range | Interpretation    |
|------------------|-------------------|
| 76% ≤ Score ≤ 100% | Very Eligible     |
| 51% ≤ Score ≤ 75%  | Eligible          |
| 26% < Score ≤ 50%  | Eligible enough   |
| 0% ≤ Score ≤ 25%   | Ineligible        |

3. Result and Discussion
We can see some results of the initial design of the product developed (phase 3) in the following figures below:
The results of the validation by experts show that the product qualifies for the next level, with a feasibility percentage of 74.33%. We can see it in Table 2. below:

| Variabel (aspect) | Number of Indicator | Total score of Indicator | Maximum Score of Indicator | Indicator Percentage (%) | Indicator Average Percentage | Aspect Average Percentage |
|-------------------|---------------------|--------------------------|----------------------------|--------------------------|----------------------------|--------------------------|
| Usability         | 1                   | 7                        | 10                         | 70                       | 73%                        | 74.33%                   |
|                   | 2                   | 8                        | 10                         | 80                       |                            |                          |
|                   | 3                   | 8                        | 10                         | 80                       |                            |                          |
|                   | 4                   | 6                        | 10                         | 60                       |                            |                          |
|                   | 5                   | 8                        | 10                         | 80                       |                            |                          |
|                   | 6                   | 7                        | 10                         | 70                       |                            |                          |
| Functionality     | 7                   | 6                        | 10                         | 60                       | 74%                        |                          |
|                   | 8                   | 8                        | 10                         | 80                       |                            |                          |
|                   | 9                   | 8                        | 10                         | 80                       |                            |                          |
|                   | 10                  | 8                        | 10                         | 80                       |                            |                          |
Experts recommend to: 1) change the colour of the theme to be brighter, 2) increase the size, and type of files that can be upload.

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