Development of E-Learning Based Blogs on Global Warming Subject

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Abstract. The purpose of this study is to determine the feasibility of learning media with a blog in e-learning based and to identify students' responses to this media on the subject of global warming. The schools are located in Bandar Lampung, at SMAN 12 Bandar Lampung, SMAN 5 Bandar Lampung, and SMA Al Ahzar 3 Bandar Lampung. The research subjects were students of class XI SMA and questionnaire method is as data collection instruments, which was validated by the expert judgment method including material experts, media experts, and informatics experts. This type of data uses qualitative and quantitative data. The method in this study is the method of research and development according to Borg and Gall, which is only limited to 7 steps because can answer the problem. Based on data from expert judgment calculation and media feasibility response according to students, this media has quality of 85.25% (very feasible) according to material experts, 86% (very feasible) according to media experts, and 89% (very feasible) according to informatics experts, while the response of students to the attractiveness of learning media has very interesting interpretation criteria with a score of 94.8% in small group trials and 94.9% in field trials.

1. Introduction

The increasingly rapid development of Science and Technology (IPTEK), as well as the development of the globalization era, requires technology to use the internet to facilitate various human activities, especially in education. The realization of Science and Technology (IPTEK) must be prepared in all components both in behavioral orientation, systems, and attitudes in utilizing ICT, and ways of thinking [1]. People potentially utilize natural wealth, if the potential and availability of various lands are utilized and able to develop His command. The success of natural use is the result of technology [2]. As for in Indonesia, according to data released by Indonesian Internet Service Users Association (APJII) the growth of internet users in 2016, especially Indonesia at 132.7 million people based on the overall population of 256.2 million people, while the 2017 APJII survey results 143.26 million people from a total population of 262 million people [3].

This shows that internet users had increased as seen from the results of the APJII survey from 2016 to 2017 increasing to 9.66 million. It can be understood that the use of Indonesian internet access is still getting a good response. Learning to use Web-Based Learning (WEB) is an environmental condition related to Information and Communication Technology (ICT) so that it can freely determine how and what learning is desired [4]. The learning process includes activities such as; observations, and demonstration and others not only by receiving material from educators [5]. One of the media that utilizes ICT is e-learning based media [6]. Students in learning are indirectly forced to play a more active role by finding their own innovation and method based e-learning [7].

One of the WEB is a blog. Blogs include the criteria of educational media because it is very flexible to access anytime and anywhere [8]. Today blogs are used also as media for da'wah such as religious...
sermons [9]. Blogs can also be used in class to train language skills and develop students' abilities [10]. Information obtained via blogs can be broad so fast to facilitate teaching and learning without limited time and space [11]. Blog users are collectively predicted by user involvement, satisfaction, and enjoyment that is felt in using a blog [12].

However, the facts show that the challenges in using ICT with E-learning come to their respective styles, diverse cultural, pedagogic in e-learning, ICT technology which is still minimal, training technical and time management in using ICT [13-15]. This study is different from other researches done before because the learning media in the form of using E-learning based blogs contain learning material in the form of files from experts or from educators into the viewing software such as Kvisoft FlipBook Maker. In addition, content supported with computers into blogs such as games, tutorials, using discussion groups, simulations using Phet Simulations, solving problems with everyday cases, practices, and exercises using online practice questions are all easily accessed and downloaded via a blog in the form of images and videos promoting, learning to use audio, visual and a combination of both audio-physical.

Observations at SMAN 12 Bandar Lampung, SMAN 5 Bandar Lampung, and Al-Azhar 3 High School 3 Bandar Lampung, have shown that there are several problems such as the underutilization of wifi facilities in schools, the lack of variation in learning media, the less optimal use of electronic devices such as smartphones, computers, and also lack of learning media, and teachers who still use printed books that take time, so that the impact is less than the maximum learning of students due to limited time. Therefore, modern education should explore and exploit the potential of learning media with internet access to increase variability in the media. As a result, it does not rely more on teachers or textbooks. Researchers consider it is necessary to develop media, interest, and feasibility with the title Development of Blog Learning Media Based on E-learning on Global Warming Subject in Senior High School.

2. Research Methods

This study uses research and development methods. These methods are used to produce certain products and test the effectiveness of these products. Borg and Gall put forward the steps in research and development including 1) potential and problems, 2) data collection, 3) product design, 4) design validation, 5) design revisions, 6) product trials, 7) product revisions, 8) usage test, 9) product revision, 10) mass production [16]

In this study the researcher, however, limited the steps to the seventh step because it only tested the attractiveness of the media created so that up to the seventh step had the outcome the problem. The research subjects were students of Bandar Lampung Senior High School class XI with a total of 103 students. Instrument data collection in the form of questionnaires were given to material experts, media experts, informatics experts to test the feasibility of learning media in the form of e-learning-based blogs. The equation used to determine the feasibility of learning media in the form of e-learning based blogs is:

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

\[P = \text{Percentage}\]
\[\sum x = \text{Total of respondents' answer}\]
\[x_i = \text{Total ideal score in item}\]

the conversion of score assessment can be seen in the following table [14]:
Thus, the type of data produced is qualitative data from product feasibility data in the form of responses and suggestions provided by the validator and quantitative data from the product feasibility score by processing the formulation of numbers at the development stage analyzed with criteria for assessment category criteria to determine product feasibility.

3. Result and Discussion

3.1 Result

The results of the development carried out in this study is to produce learning media in the form of e-learning-based blogs, with global warming subject in senior high school.

1. Results of potential and problems
   The result is that inefficiency of internet facilities, smartphones, and computers in schools. Also, there has been yet learning media in the form of e-learning-based blogs on global warming subject.

2. Data Collection Results
   Data collection was obtained from interviews, questionnaires, and documentation.

3. Product Design Results
   Display of product design results
   Display of learning media products in the form of e-learning based blogs as follows:
a. Design Validation Results

According to the validation of expert and interesting assessments on student responses, the steps in developing learning media in the form of e-learning based blogs developed by researchers can be seen in the following. An assessment of the expert validator of the material is presented in the following:

Based on the validation results of the material expert, the average rating achieved was very feasible. The validation percentage in the Feasibility aspect is 84% with the interpretation category Very feasible. In terms of language, coverage reaches 82.50% with the interpretation category Very feasible, and the aspect of the Display reaches 83% in the category Very feasible and 90% achieved in aspects of ease of use with criteria very feasible. The validation results of expert material all aspects that were rated totaled 280 with 85% so that they got a very feasible category.

However, the assessment of the media expert validator is presented in the following:

Based on the validation results of a media expert, the average rating achieved was very feasible. The percentage of validation in the Ease of use aspect is 88% with the interpretation category Very feasible, and the aspect of the Display reaches the...
percentage of 84% with the interpretation category Very feasible. The aspects 83% with the category Very feasible and 86% is achieved in the aspect of Design with Very feasible criteria. The validation results of the media expert in all aspects are valued at a total of 280 with 85% so that it gets a very feasible category.

While the assessment of the informatics expert validator is presented in the following:

Graph 3. Graph of expert validator of the informatics

Based on the validation results of the informatics expert, assessment achieved was very feasible. The percentage of validation in the aspect of the layout is 83% with the interpretation category is very feasible, and the aspect of the menu (icon) reaches the 87% with the interpretation category is very feasible. The aspect of ease of use is 100% with the category very feasible. The aspect of supporting software reaches 85% with the category Very feasible, on the data processing aspect the percentage is 90% with the category Very feasible. The Interactive aspect is 83% with the category Very feasible, and 90% is achieved in the aspect of Online learning with Very feasible criteria. The informatics expert validation results in all aspects that are valued at a total of 280 with a percentage of 85% so that they get a very feasible category. Therefore, it can be concluded that the learning media in the form of e-learning-based blogs are good and ready to be used as learning media in schools. The product design is then validated through the assessment of material experts, media experts, and informatics experts.

b. Design Revision

After researchers have known the product weaknesses according to the three experts, the product is repaired.

c. Product trial

The trial results were carried out in two stages, small group trials and field trials. Small group trials Based on 4 aspects of assessment reached 95.3%. The aspect of the response to E-learning blog media comes to 95%, material suitability aspect 94.8%, media aspects meet students’ learning 94.4%. As in the graph below.
Based on 4 aspects of evaluation in the form of e-learning aspects, the assessment reached 95%. The aspect of the response to e-learning blog media reaches 95.2%, material suitability aspects 94.3%, media aspects meet the learning needs of students 95%. As in the graph below.

The comparison of the results of the trial between small-scale trials and field tests can be seen in the graph below:

Graph 4. Graph of Small group trials

Graph 5. Graph of field trials

Graph 6. Graph of comparison of the results of the trial between small-scale trials and field
According to the graphs, small group test reached 94.8% and field test of 94.9%. This shows that the small group trial has received a very good attractiveness response, so there is no need for revision. Followed by a field trial, there is a 0.1% increase which is clearly indicated by the difference in the number of respondents involved in the two tests above. The above mentioned means the response of students to the learning media in the form of e-learning-based blogs on global warming subjects in senior high school which is included in the criteria of very high attractiveness.

3.2 Discussion

The initial steps taken in producing learning media, including determining ideas, analyzing the material to be displayed, determining the web system that will be made such as (content home, bus, problem-solving, discussion, questions online, games, downloading, about me and supporting software in the form of K-visoft flipbook maker, PhET simulation and practice questions). The product is expected to be used by teachers in learning activities and students can more easily understand the concept of learning well.

Products that have been developed are then validated by several experts before being tested in the field. Validation was assessed by 2 material experts, 2 media experts and 2 informatics experts. This research and development of learning media were to produce media in the form of an e-learning-based blog on global warming subjects on senior high school, knowing the quality of learning media according to material experts, media, and informatics, as well as knowing the response to the attractiveness of the products developed.

The success indicators of developing this learning media are seen using 1-5 Likert scales which are then adjusted to the range of feasibility and interest values. The use of online questionnaires is easy to access and direct more flexible learning without using paper.

Learning media products such as e-learning-based blogs on Global warming subjects in senior high school has 85% media quality (very feasible) according to material experts, 85% (very feasible) according to media experts, 88% (very feasible) according to informatics experts, whereas the response of students to the attractiveness of the learning media in e-learning-based blogs on Global warming subjects in senior high school is stated to have very interesting interpretation criteria with a score of 94.8% in small group trials and 94.9% in field trials.

It is different from research before since the learning media in e-learning-based blogs on Global warming subjects in senior high school contains learning the material with files from experts or from teachers who are inserted into the viewing software such as Kvisoft FlipBook Maker. In addition, the content supported by computers into blogs such as games, tutorials using discussion groups, simulations using Phet Simulations, solving problems with everyday cases, and practices and exercises using online training questions are all easily accessed and downloaded via blog in the form of pictures and videos that prioritize learning to use audio, visual and a combination of both audio-physical.

The following is the initial display of the blog page created by researchers that can be accessed through https://fisikamaknyuzzz.blogspot.com/.

![Figure 2. The first display of the blog](image-url)
Figure 3. The material page

Figure 4. Problem-solving page

Figure 5. Online question page

Figure 6. Discussion page
4. Conclusions And Recommendations

4.1 Conclusion
Based on the results of research and development, the following conclusions are obtained:
1. Learning media products in e-learning-based blogs on Global warming subjects in senior high school have 85% media quality (very feasible) according to material experts, 85% (very feasible) according to media experts, 88% (very feasible) according to informatics experts
2. The response of students to the attractiveness of the learning media in e-learning-based blogs on Global warming subjects in senior high school was stated to have very interesting interpretation criteria with a score of 94.8% in small group trials and 94.9% in field trials.

4.2 Recommendation
Based on the conclusions above, some suggestions can be stated as follows:
1. For who wants to continue the research, they should develop learning media of e-learning-based blogs using a variety of interesting software that can be owned by students offline that can be accessed through blogs.
2. For researchers should create a blog account or other types of websites and SEO friendly should be easy to find in search engines like Google and others.

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