The Development of Physics Education Problem Based Learning Web as Physics Learning Media for Vocational High School

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Abstract. Online learning media is an effective learning facility in solving learning problem which is related to limited time. This research is aimed to develop the physics education problem based learning web for Vocational High School. Physics Education problem based learning web consists of 5 main menu for students; competence, material, exercise, evaluation and compiler while for teacher gets additional menu that are student data and student evaluation result. Physics education web can assist teacher and student in online learning and can be accessed anytime and anywhere. The subject of this study is that the development of Physics Education Learning Web for Vocational High Schooler on temperature and heat material. The result of the study is determined by the development of Physics Education web and the implementation of online physics learning.

1. Introduction

Hadriana [1] states that information technology and communication brings huge impact for education. Information technology should be considered as media that can facilitate in achieving the purpose of learning. One of example of information technology is that a website [2]. Hilal [3] states that learning with website concept will change the form of conventional learning become digital learning and can be up to date so that it can attract students attention.

Learning media web-based has impact to the enhancement of students motivation [4], while Yen Ting Lin [5] states that learning using interactive media web-based can enhance the involvement of the students in learning activity. Therefore, this web service can be considered as learning media that can assist to convey material in learning activity.

The advantage of this web as learning media has been proven by Guy [6] that shows how effective learning using web because it can increase the students outcome. Setiyorini [7] shows that learning web-based can support the students ability in collecting the information as learning material, improve the independency, motivation and students outcome. The students should combine the learning web-based with learning approach, one of approach that can improve the independency, motivation and students outcome is that problem based-learning.

According to Aweke [8] learning process that implement problem based learning can improve students motivation and the ability of problem solving in learning physics.

Problem based-learning is initiated from problem. Learning a concept and the principle of problem solving. Problem based-learning expects the students to think critically and anatically, it is also to find
and use the appropriate learning sources [9]. The result of study from Norazah [10] shows that the using ICT problem based-learning can develop the graduates competencies that is innovative in education.

In this study, the display of learning media web consists of competency, material, exercise, and evaluation in accordance with Physics lesson in Vocational High School. This web is aimed to facilitate the physics learning process for teacher and student on temperature and heat material.

2. Methodology
The study is initiated with analyze the problem related to physics learning in vocational high school, then the solution is that the implementation of learning media web problem based-learning. The next stage, the web is designed and adjusted to Physics in Vocational high school. Afterwards, the development of learning media web is began as the design and planning.

This Website is already validated by three experts, the valid web page can be accessed with PC and Android/IOS. The competency and material page can be accessed by anyone without login, the exercise and evaluation page should be accessed by login. At that page, the student is asked to enter the name and password that is their student ID number. Afterwards, the student can access the exercise and evaluation and the result can be directly shown after finishing the questions.

The admin or teacher page can login by entering name and password, after that, the teacher can enter the students data so that students can login to exercise and evaluation. At that page, teacher can insert the material, exercise, evaluation and the result as well.

3. Results and Discussion
In this study, the web can be accessed with PC or android/IOS. The homepage display of the web page is asked the visitor to open the material as shown in Picture 1.

In this homepage, it consists of some main menu; competency, material, exercise, evaluation and compiler. In this homepage, the students is asked to access ‘read the material’ then the student can get the material about temperature and heat with the question example as shown in Picture 2.
The menu of competency, material and compiler can be accessed by the student without login, while exercise and evaluation menu should be login as shown in Picture 3 by entering name and password.

After the students login, they can access exercise and evaluation, afterwards, they can get the result of the test as shown in Picture 4.
Picture 4. Exercise and Evaluation Display

As teacher or admin can access the web by login entering username and password as shown in Picture 5.

Picture 5. Login display as admin

After login as admin, teacher can access the students data, insert the material, add the exercise and evaluation. Teacher also can see the result of the students as shown in Picture 6 as below.
4. Conclusion
The Physics Education problem based-learning media web can be applied as one of learning media that can assist teacher and student during the physics learning process that can be accessed anytime and anywhere.

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