

## Validity and Practicality of Problem-Based Electronic Learning Media

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**Abstract:** This study aims to obtain valid and practical results on problem-based electronic learning media for use in teaching. It is designed to be able to improve students' understanding and activities in order to reach learning outcomes. Research and Development (R and D) methods with 4-D development procedures (define, design, develop, and disseminate) were used. Data analysis techniques included descriptive analysis to describe the validity and practicality of problem-based electronic learning media. The results obtained from this development research concluded: (1) the validity of problem-based electronic learning media is valid in media and material aspects (2) the practicality of problem-based electronic learning media according to teacher and student responses are considered to be very practical. Based on the findings of this study, it was concluded that problem-based electronic learning media was declared as valid and practical, and should be used as teaching material.

**Keywords:** Electronic learning media, practicality, validity

### INTRODUCTION

Students tend to have a better understanding of technological developments due to their age, hence why it is important to the development of education and teaching standards. Furthermore learning is an interaction that occurs between students and teachers to achieve knowledge-based goals, it must be well equipped to maximise the outcomes.

Learning media is a very important resource in teaching as it aids students' understanding of the material. Issues that arise during learning include lack of motivation or understanding, especially when the information can be quite dense and teacher-student contact is limited (Garjita et al. 2017). The materials used are generally for displaying slides, and other than that are considered pointless until they are explained by the teacher, which cuts down on how much material is taught per class (Paska et al. 2017). In order to adjust to the new curriculum, teachers must be proactive in implementing media in class, therefore students can use technology to become more independent in their studies (Yuniarti et al. 2014). Current learning medias used are powerpoints and teaching materials downloaded from the internet, student motivation is still limited because learning languages is guided by the material given by the teacher (Sudarma et al. 2017).

This is in line with what researchers found, where lack of innovation in the learning process lead to students taking less initiative. A form of media that can increase student activity is using problem-based learning models, where students can apply real-world problems to a condition in order to develop critical thinking skills and obtain knowledge on the subject matter (Rusman 2010). Solutions offered by previous researchers to overcome these problems include the implementation of instructional media in the form of e-modules. Its advantages come from its interactive nature and easy navigation, with displaying/loading images, audio, video and animation as well as formative tests/quizzes that allow immediate automatic feedback. The Problem Based Learning module (Garjita et al. 2017), coupled with electronic media, provide more interesting presentation, engaging students to take an active role in learning independently (Sudarma et al. 2017).

Problem-based electronic learning media is expected to influence the learning process where initially passive students become more active. It can make abstract material more concrete, and provide assignments that encourage students to better understand the lesson, both in and out of the classroom. Based on this description, the author is interested in conducting research on the Development of Problem Based Electronic Learning Media.

## METHOD

The model used for conducting this thesis is research and development. Development is used to produce products through an evaluation of the needs, and testing their effectiveness in order to release the product into the target community (Sugiyono 2012). Based on existing definitions, it can be concluded that development research is a series of processes that produce products supported by science.

Problem-based electronic learning media uses a 4-D (four-D) development model. It was chosen because of its simple and systematic procedure, with expert judgment and testing based on the assessment, suggestions, and input of an expert. The development process consists of four stages: (1) Define; (2) design; (3) develop; (4) disseminate (Trianto 2017).

## Validity Analysis

The data obtained was analyzed using the Aiken's V validity coefficient, formulated based on the expert's assessment of the number of people on an item regarding the extent to which the item could represent a measure (Azwar 2014).

$$V = \sum s / [n(c - 1)]$$

Information:

V = index of validity

s = r - lo

lo = lowest validity rating

c = highest validity rating

r = number given by a researcher

n = number of assessors

The results of the Aiken's V validity coefficient determine that, of the items assessed,  $\geq 0.66$  is categorized as valid, and  $< 0.66$  is invalid. In this case, the numbers obtained can be used in research if they have met the valid instrument requirements.

## Practicality Analysis

The results of the study were acquired through questionnaires and problem-based electronic learning media. Students and teachers are asked to determine the practicalities of the model being studied. The practicality value was calculated with the following formula.

$$NA = \frac{S}{M} \times 100\%$$

Information:

NA = final score

S = a score obtained

M = maximum score

The results were grouped according to the level of practicality as shown in Table 1:

Table 1 Categories of Practicality of Learning Media

No	Achievement Level (%)	Category
1	81-100	Very practical
2	61-80	Practical
3	41-60	Pretty practical
4	21-40	Less practical
5	0-20	Not practical

## RESULT AND DISCUSSION

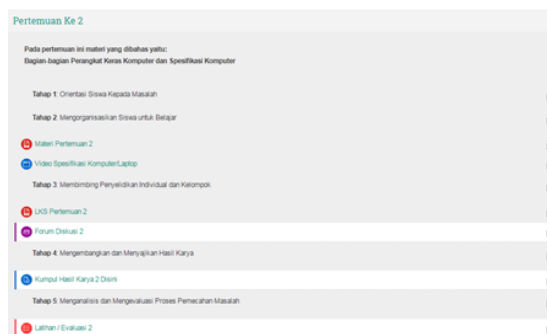
The results of the research conclude that a problem-based electronic learning media is a valid and practical tool for learning. The results can be seen in Figure 1, Figure 2, and Figure 3.

Figure 1. Early View of Learning Media



This is the main page. There are content and courses consisting of 18 meetings, which can be retrieved by teachers and students. Courses can be accessed if the user has logged in and registered for the course.

Figure 2. Display of Course Content



The course includes content and learning materials that can be accessed and downloaded by teachers or students. The content has been properly arranged so students can choose according to the sequence of material available.

Figure 3. Display of Student Worksheets



The display of this worksheet is prepared by directing students into problem-based learning. These worksheet consist of basic competencies, indicators and learning objectives, instructions for students, orientation to the problem and finding problems consisting of narratives that stimulate the student. They can write the answers found, then determine the solution to the problem and use the last column to write a conclusion.

The stages of problem-based learning are arranged into meetings, starting from stage one up to stage five as can be seen in Table 2.

Table 2. The Stages of Problem-Based Learning in E-

Stages	Teacher's Actions	Activity or Resource
1 Student orientation to	The teacher explains the purpose of learning and what	File & Page

	problems	problem-based learning is.	
2	Organizing students to learn	The teacher helps students define and organize learning assignments, in e-learning students are directed to study existing learning material and videos	
3	Guiding individual and group investigations	The teacher encourages students to gather appropriate information and directs students to complete student worksheets and solve problems found in discussion forums by commenting on existing problems.	Page & Forum
4	Develop and present the work	The teacher helps students plan and prepare reports on the work made from completing existing student worksheets. The results of the work are based on the groups that have been determined, the group can be seen in the gathering menu of the work here.	Assignment
5	Analyze and evaluate the problem solving process	The teacher evaluates the work that has been made by students, by assessing the exercises and evaluation.	Assignment & Quiz

### Learning Media

The media that has been designed is tested for its validity, carried out by three media and three material experts. Parts of the media validated are the didactic, construction and technical aspects. Validated material aspects are the quality of the material and learning. The results obtained are valid values for the design of instructional media, which are summarized as shown in Table 3.

Table 3. Results of Problem-Based Electronic Learning Media Validation

No.	Validator	Assessment	Category
1.	Validator 1	0,93	Valid
2.	Validator 2	0,84	Valid
3.	Validator 3	0,86	Valid

Table 2 shows the results of validation from media experts on problem-based electronic learning media. The results suggest that the media has a validity value of  $0.93 \geq 0.66$  given by the 1st validator, the second is  $0.84 \geq 0.66$ , and the third is  $0.86 \geq 0.66$ . The problem-based electronic learning media obviously belongs to the valid category.

Validation was carried out by material experts the quality of the material put out and the quality of learning produced. In implementing its validity, material experts review the material based on a problem, then the validator gives a value to the material contained in the problem-based electronic learning media. The results of the evaluation of each aspect given by the validator is then analyzed using Aiken's V statistical formula. The results obtained are valid values for the product design produced. The results of the validation recapitulation are summarized from the aspects of the learning media material assessed as shown in Table 4.

Table 4. Material Validation Data on Problem-Based Electronic Learning Media

No	Validator	Assessment	Category
1	Validator 1	0,87	Valid
2	Validator 2	0,82	Valid
3	Validator 3	0,86	Valid

Based on the above, the results of problem-based electronic learning media material validation has a validity value of  $0.87 \geq 0.66$  given by the first validator,  $0.82 \geq 0.66$  given by the second validator, and  $0.86 \geq 0.66$  which given by the 3rd validator - the material on problem-based electronic learning media belongs to the valid category.

The media has been declared valid, and a practical test is conducted to both teachers and students to find out the performance, including any obstacles. The results obtained are summarized as shown in Table 5.

Table 5. Results of Teacher and Student Responses

No	Respondents	Achievement Rate (%)
1	Teacher	95,11

2	Students	84,24
Average		89,67
Aspects Category		Very Practical

The results of the analysis of teacher and student responses based on Table 5 obtained an average of 89.67%. It can therefore be concluded that problem-based electronic learning media is declared practical.

That learning media should meet the requirements of being visible, interesting, and accurate, it should also be read easily and attractively designed so as to motivate students in accordance with the characteristics of learning materials (Nana & Ahmad 2013).

The practicality test results of learning media were stated to be very practical. In accordance with the opinions of Nana & Ahmad 2013, learning media must have the value of practicality and equality so that it can be used easily.

## CONCLUSIONS

This study produces electronic learning media in the form of websites that can help tackle problem-based tasks in the lesson. It is stated by experts as a valid learning media and expressed by teachers and students as a practical form of learning.

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