Validity of module based on project based learning in media biology subject

D Susanti1*, V Fitriani1, and L Y Sari1

1Program Studi Pendidikan Biologi Sekolah Tinggi Keguruan dan Ilmu Pendidikan, Jl.Gunung Pangilun, Padang 25125, Indonesia

*Corresponding author’s email: dianasusantimdp@yahoo.co.id

Abstract. Media biology subject pushed the students to produce the media that used in learning process, but no one the student used the learning material. It made the student not creative to make the designed or created the media. To solved this problem, it need to develop the learning material based on project based learning, because in media biology subject the students must designed or created the media that used in learning. Module was helped the students learned independently. It made student learned to design and create the good media that used in learning process. The purpose of this researched were to produce module based on project based learning in media biology that valid. Models and procedure of development was developed with four-D model, this researched was develop phase. Developed phase to validation the module was done in STKIP PGRI West Sumatera. The data came from the lecturer as validator. Data was obtained to determine module derived from validation sheet. Validity average of module was 97.34% and the category is very valid. Based on the result, it can be concluded that the module based on project based learning in media biology subject is very valid.

1. Introduction

Biology learning media subject require creative students to design and create learning media that accordance with the characteristics of the material and learning objectives that exist at the junior and senior high school level. Biology material for junior and senior high school is material that guides students to think critically, understand concepts, structures, mechanism in living things. Among the biological material of junior and senior high schools taught in schools concerning plants, animals and microorganisms. If the material is detailed, discuss the concepts starting from the understanding of each phylum, traits, reproduction, respiratory, digestive, excretory, disease and technological mechanisms that are in accordance with the material and its relation to the community environment. The material can sometimes not be understood directly by students, teachers need the media to increase students’ understanding when teaching in the class.

The lectures biology media have been taught so far, there are still many students who are less creative in creating/designing biology learning media, besides that sometimes they are not yet suitable to choose the media learning objectives they will choose. On the other hand, the media created and produced during lectures sometimes does not match the predetermined learning goals. For that they need teaching materials that support them in understanding the concept of learning media and designing / creating various types of media. Though learning media is an important component in the learning process [1].
To solve these problems, a learning module based on Project Based Learning is designed. The learning module is chosen as a learning media developed because students are expected to learn independently using learning modules [2]. The selection of project-based learning models that are matched in the preparation of learning modules because each stage in project-based learning can make students become creative in learning [3]. Project-based learning involves students in investigating problems and ending up in real products [4]. In this project-based learning students are actively involved and are expected to have independence in designing a learning activity and obtaining a real product or project [5]. According to project-based learning has tremendous potential to create a more engaging and meaningful learning experience for adult learners, such as those studying at college or training to enter workforce [6]. The purpose of this study is to produce valid project based learning media learning module.

The researched about the module based on project based learning has been done by Maiasputri with the title “the validity of the development of project-based oriented learning modules on evolution and biotechnology materials” and The results of the validation of biology learning modules based on project based learning developed is very valid [7]. The research about Development of Project-Based Learning Science Module to Improve Critical Thinking Skills of Junior High school students and the results of the validation of science learning modules is very valid [8]. The research about develop E-Module based on Project Based Learning in simulation digital subject with the result very valid [9]. Reference [10] also develop E-Module based on Project Based Learning in web program subject and the result is still very valid. The research about Developing Project Based Learning Module of CNC Milling Mechanical Technique on Mechanical engineering Departement Vocation High School in Surakarta and the result is very valid [11]. According the results, it can be seen that the Module based on project based learning is need to develop.

2. Experimental Method
This research is development research using a 4D model [12]. This research is limited to the develop stage, which is to determine the validity level of module. The instrument used is a questionnaire analysis of validitas module, modified from Zahara with two options [13]. The option are yes or no. The Indicator of instruments are the characteristic of module, the element of quality, language and the stage of PjBL. Questionnaire filled by four validators. The validators is expert in their field. The first validator is media biology subject expert. The second validator is media subject expert. The third validator is expert in strategy in biology learning. The fourth validator is language expert. The data analysis technique used a percentage formula. [14]. The percentage formula is:

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\text{The value of validity} = \frac{\text{total score the get}}{\text{the sum of hight score}} \times 100\%
\]

The criteria of validity used the Riduwan and Akdon [15] as in Table 1.

| Percentage (%) | Criteria          |
|---------------|-------------------|
| 81 – 100      | Not valid         |
| 61 – 80       | Less valid        |
| 41 – 60       | Enough valid      |
| 21 – 40       | Valid             |
| 1 – 20        | Very valid        |
3. Result and Discussion

Based on the data analysis on the practical guiding validity test questionnaire by media experts, the material, strategy and design of the students and the language obtained an average value of 97.34% with very valid criteria. Can be seen in Table 2.

Table 2. Value of Validation of Module Based on Project Based Learning.

| No | Aspect                        | Validator Value | The validation value | Criteria  |
|----|-------------------------------|-----------------|----------------------|-----------|
|    |                               | I   | II  | III | IV  |                     |           |
| 1  | The characteristic of modul   | 81.81| 100 | 100 | 100 | 500                 | 95.98%    | Very valid |
| 2  | The element of quality        | 83.33| 100 | 100 | 100 | 450                 | 96.53%    | Very valid |
| 3  | Language                      | 80  | 100 | 100 | 100 | 380                 | 96.88%    | Very valid |
| 4  | The stage of PjBL             | 100 | 100 | 100 | 100 | 500                 | 100%      | Very valid |
|    | Total                         |     |     |     |     |                     | 389.39%   |           |
|    | Average                       |     |     |     |     |                     | 97.34%    | Very valid |

Aspects assessed in the module validity based on project based learning include: module characteristics, quality elements, language and the stages of project based learning. Evaluation of module validity based on these four aspects can be used as a way to assess whether a product is feasible or not.

The characteristic aspects of the module on practical guidance, it was obtained an average of 95.98% with very valid criteria. This showed that the material presented in the practical guide is in accordance with the learning objectives to be achieved. The material studied and learned in modules is communication, learning media, classification of educational media according to experts, photography and video shooting, designing and presenting and displaying junior / high school biology learning media, the substance of the module in accordance with curriculum references and research results. Preparation of teaching materials based on the results of testing, it will obtain accurate, up-to-date and ongoing information and data [16]. The subject matter of this biology learning media, trains students to make learning media. For example students make original learning media, preservation, models and multimedia. Original media that is made is usually found in plant structure material. Usually students bring parts of the plants directly in learning. For material related to animals such as the world of animals, both vertebrates and invertebrates, in lectures learning media students make aquarians, terrariums, insecticides and others. One example of the results of the original media made by students in accordance with the curriculum can be seen in Figure 1 below.
While examples of artificial media designed from original media such as models or cross sections can be seen in Figure 2 below.

Aspects of quality elements in the module obtained an average of 96.53% with very valid criteria. The overall module design is very good and interesting, both in terms of the shape and size of the letters, the drawing of the images presented in accordance with the material. The various color combinations on the display have been adjusted to the preferences of the students. The module attraction to the overall appearance of the module, the color, the font size and the clarity of the instructions [17]. This is in accordance with The opinion of Mahmoud if students can focus on learning, this is proven to improve learning outcomes [18].

Based on the result about the language aspects of the module obtained an average of 80% with valid criteria. This showed that the module already has the form and size of letters that are easy to read, the information presented is clear, the language used in the module is in accordance with the rules of Indonesian language that is correct and good, and in terms of readability and clarity of information does not cause doubt. In writing a module try to make the sentence used should be concise, simple, limited to the things that matter only. The concept is clearly illustrated, the writing is clear, simple and easy to read [19]. The effective sentences are clear, concise, and straightforward sentences so students can easily
understand them [20]. In addition, effective sentences are sentences that are not ambiguous and do not obscure meaning. The less effective sentences will make students confused in understanding the storyline in the modul [21].

From the result the aspects of the stages of project based learning in the module obtained an average of 100% with very valid criteria. This shows that this module based on project based learning makes it easier for students to carry out the process. In the module based on project based learning, this is evaluated by all validators because it trains students to conduct investigations theoretically and through experimental activities. Students are also trained to work together in groups and exchange thoughts in carrying out an activity. The development of a project-based learning oriented module is one of the activities that can extend and deepen the material applicatively [22]. The project-based learning model is one model based on constructivism that supports the involvement of learners in problem-solving situations [23]. Learners in project-based learning are directly involved in the real-life environment in solving problems, so the knowledge gained is more permanent [24].

4. Conclusion
From the results of the research it could be concluded that the module based on project based learning was declared very valid by material experts, media and language validators with an average value of 97.34%. Thus the module based can be stated to be very valid from several aspects, like the characteristics of the module, elements of quality, language, and stages of the project based learning process.

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