The Validity of Interactive Learning Multimedia on Protista and Fungi Materials for Senior High School

E Wulandari [1*] Azwir Anhar [2]

[1] *Dept. of Biology, Faculty of Mathematics and Science (FMIPA), Universitas Negeri Padang, Padang, Indonesia*
[2] *Dept. of Biology Education, Faculty of Education and Teaching Training. UIN STS, Jambi*
[*]*Corresponding author. Email: endahwulan863@gmail.com*

ABSTRACT

The difficulties faced by the students in studying protista and fungi materials based on the result of the interview were in understanding the life cycle, finding and observing the species objects. This type of research was a design and development by using the Plomp model. This study was aimed at finding an interactive learning multimedia on the protista and fungi materials that was valid. The multimedia validation results were in the very valid category.Thus, it can be concluded that the multimedia interactive learning on protista and fungi materials that has been developed is very valid.

Keywords: *fungi, interactive multimedia learning, protista, validity*

1. INTRODUCTION

The problems faced in studying Protisa and Fungi materials based on the preliminary studies that have been carried out in three senior high schools /MA are students' difficulties in understanding the life cycle and finding and observing objects through the aid of a microscope on observation activities. This is due to the limited object species found in the environment of students[7].

In line with the results of the study[8] also showed that the students have a high level of difficulty understanding and describing the reproductive way / life cycle of fungi. Based on this, a solution is needed that can help the students and the teachers in overcoming the limitations of the object to be observed by presenting media in learning[7].

The media functions as a tool in displaying abstract images of Protisa and Fungiinto real and animated reproduction / life cycles on Protisa and Fungimaterials. This is in line with the opinion[21] that the media has a role to help facilitate student learning and help ease teaching when presenting an abstract concept or a concept that will be realized in a concrete or tangible form.

The media that researchers will present as the solution is multimedia. Multimedia includes a combination of text, audio, still images, animation, video, and interactivity content [22][23].Multimedia can be used to transform abstract concepts into more concrete ones, display objects such as microorganisms that are invisible to the human eye, and multimedia is able to overcome the limitations of space, time and energy in displaying complex processes, so Biology can be taught by teachers and understood by the students easily [14].Through this interactive multimedia, abstract concepts can be presented more clearly in learning to make it easier for students to understand the learning material[26].

The above statement is in line with the results of the study[21] the use of interactive multimedia in learning makes the message conveyed in the material more tangible because it is presented in plain view and can stimulate various senses so that there is interaction between the senses of students. Learning can succeed well if students are invited to utilize all of the senses. The more sensory devices used to receive and process information, the more likely the information is understood and understood and can be retained in memory[21].This is in line with the opinion [24] that the more senses used by students, the better retention / memory of studentsin learning as described in the Dale' experience cone.

The use of multimedia will stimulate some sensory organs of students, so that students' understanding of Biology becomes more perfect[22][23]. Students who are taught through multimedia have a high understanding of Biological concepts. Thus multimedia proves to be a superior instructional or teaching strategy. Multimedia can also be used for practice, problem solving, understanding science, concepts, and abstract simulations in science. Multimedia takes into account the learning styles of different students. Multimedia is able to build students' knowledge actively, work in groups and use multi-senses. Multimedia provides opportunities for students to be able to learn anywhere and anytime (flexibility)[22][23].

Validity requires that the instrument be reliable[21]. The first aspect of determining the quality of learning products is validity or validity[9]. Validity determines the quality of interactive multimedia that is developed. Before the product is used, of course, in terms of its validity, it was firstly viewed based on certain criteria[3]. To find out whether the interactive learning multimedia developed has been valid or there are still things that need to be improved, then an evaluation can be done

based on components that include the appropriateness of content, linguistics, offerings, and graphics.
Components of content eligibility include conformity with IC, basic competency, conformity with child development, conformity with the needs of teaching materials, the truth of the substance of learning material, benefits for adding insight and conformity with moral values, and social values. The linguistic component includes readability, clarity of information, conformity with good and correct Indonesian language rules and effective and efficient use of language (clear and concise). The components of the presentation include the clarity of objectives (indicators) to be achieved, the order of the presentation, the provision of motivation, attractiveness, interaction (providing stimulus and response) and completeness of information. The graphics component includes the use of fonts; type and size, layout or layout, illustrations, images, photographs and display design[5][6]. This study was aimed at finding an interactive learning multimedia on the protista and fungi materials that was valid.

2. MATERIALS AND METHODS

This type of study was a design and development research. This study used a Plomp development design model[6]. Multimedia validation tests were conducted on 5 validators covering aspects of content worthiness, linguistic content, presentation and graphics. Formative evaluation was in the form of a validation sheet. The data collection instruments in the form of questionnaires. Validity analysis uses validity data. The data analysis begins by providing a scoring for each item. The scoring was based on a Likert scale with the provisions as in Table 1.

Table 1. The categories and item grain of likert validity Scale[27]

Score	Category
4	Very agree (SS)
3	Agree (S)
2	Disagree (TS)
1	Very Disagree (STS)

Then, the results of the scoring are tabulated and the percentage is searched using the following formula.

$$\text{Validity} = \frac{score\,obtained}{score\,maximum}\ x\ 100\%$$

Based on the score of the validity obtained, the assessment criteria for the validity of interactive learning multimedia were determined with the provisions as in Table 2.

Table 2. Categories of validity of interactive learning multimedia[20].

Validity Score (%)	Category
0-20	Invalid
21-40	Less Valid
41-60	PrettyValid
61-80	Valid
81-100	Very Valid

3. RESULT AND DISCUSSION

3.1. Result

The results of the validity of interactive learning multimedia can be seen in Table 3.

Table 3. Results of Validity of Developed Interactive Learning Multimedia

No	Assessment Components	Validation Value(%)	Category
1.	Content Feasibility	80	Valid
2.	Linguistic	86,66	Very Valid
3.	Presentation	85	VeryValid
4.	Grafting	88,33	Very Valid
Mean		85	Very Valid

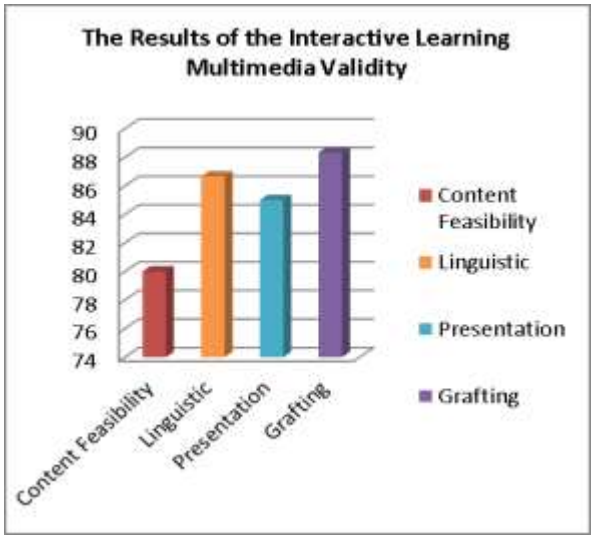

Figure 1. The Results of Validity of Interactive Learning Multimedia Developed

3.2. Discussion

Based on Table 1.and Figure 1. It can be seen that the results of multimedia interactive learning validation on the Protista and Fungi materials by five validator lecturers on each aspect assessed. The aspect of the feasibility of the content obtained 80%, linguistic obtained 86.66%, presentation obtained 85%, grafting obtained 88.33%. The mean was 85% with a very valid category. The interactive learning multimedia was said to be very valid because it has fulfilled all four aspects, namely the appropriateness of content, linguistics, offerings and graphics.

Rating on the aspect of content eligibility, obtained 80% with a valid category. Valid categories were obtained because multimedia was appropriate with the learning indicators. The difficult concepts that have been visualized in the form of animation, animation can be useful to overcome the problems of students. This is consistent with the opinion[10].that animation has the ability to be able to expose something complex or complex to be explained, able to explain a material that is clearly not visible to the eye. Animation has advantages as a means to provide understanding to students of the material provided and attract the attention of students and increase motivation.

The results of interactive learning multimedia validation on linguistic aspects obtained 86.66% with a very valid category. Interactive learning multimedia fulfilled linguistic aspects because it used Indonesian language norms that are good and right. As well as already using a clear sentence structure and using the correct vocabulary. One of the criteria for multimedia teaching materials according to[4] is that narration or language must be clear and easily understood by students, the use of terms needs to be adjusted to the use of media so that learning can be effective. This is supported by the statement [5][6] that all teaching materials must pay attention to the linguistic component in accordance with aspects of language eligibility, so that the accuracy of sentence structure and systematic arrangement of material will facilitate students in understanding learning.

The results of interactive learning multimedia validation on the aspect of the presentation obtained 85% with a very valid category. Interactive learning multimedia fulfilled the presentation aspect because the presentation of the material in multimedia wassequential, already interactive. Besides multimedia can increase students' interest and motivation in learning and have complete information. Interactive media can increase motivation and effectiveness of learning outcomes for its users in accordance with the results of research[15] where multimedia can increase understanding, motivation, attendance and satisfaction of students. The use of interactive multimedia in learning has its advantages with the presence of animation, graphics, sound images and graphics, increasing student understanding in learning. The process of gaining knowledge becomes more efficient when students experience an event through observation of an existing simulation in multimedia[1]

The results of interactive learning multimedia validation in the aspect of graphic were 88.33% with a very valid category. Interactive learning multimedia meets the graphic aspect because it already uses the type of writing and font size that can be read. The appropriate use of color combinations and the pictures / photos that are made are appropriate to the material, have the right size so that it's easy and clear to see. This is appropriate with the characteristics that need to be considered in developing interactive media according to [25] the media should use interesting variations, that is, an attractive appearance by multiplying images and objects that are in accordance with the demands of the material will increase students' interest in the subject matter, not making it saturated or even fun. Furthermore [17] also said that the presentation of the pictures is needed to support and clarify the contents of the material, clarifying the description of the material to be delivered so as to make students interested in learning it.

Multimedia displays animations appropriate with the explanation of the material, has a size that is easy to see, the movement is not too fast and attractive colors. The introductory sound is appropriate with the materials, uses good and correct Indonesian, and is easy to understand. The accompaniment music / instruments are appropriate with the characteristics of students thereby increasing student motivation and creating a pleasant atmosphere in learning. The multimedia that is made is technically good and there are instructions for use that serve to facilitate students in using interactive learning multimedia and the media already have an attractive appearance. The results of the study [18] showed that learning by using interactive multimedia can improve students' achievement and resentation. The above statement is supported by research results [12]. Multimedia is proven to be able to overcome the barriers of space and time and can be used anytime and anywhere as a medium to educate students on various sciences.Clearly, it saves time, money, and energy[13].

4. CONCLUSION

The interactive learning multimedia on Protisata and Fungi materials developed is very valid.

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