

A Need Analysis of Developing Interactive Learning Multimedia on Protista and Fungi Materials for Grade X Senior High School

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Abstract - This study was aimed at revealing, analysing and explaining or describing the reality on the need in developing interactive learning multimedia on Protista and Fungi materials. This type of research was a descriptive research using a qualitative approach. Based on the results of the data analysis that has been done and the results of preliminary research it could be stated that students had difficulties in finding and observing protista objects, direct observation of microscopic and macroscopic fungi, understanding reproductive fungi both sexually and asexually. Then, there was no any interactive multimedia learning on protista and fungi materials.

Keywords - Need analysis, Development, Interactive Learning Multimedia, Protista, Fungi.

I. INTRODUCTION

One of efforts to improve the quality of education in Indonesia is done by improving the curriculum because the curriculum is able to influence student competencies in learning. In the 2013 Curriculum, learning in all subjects must contribute to the formation of knowledge, attitudes and skills, thus students who have competencies on knowledge, spiritual attitudes, social attitudes and skills will be formed (*PP 32 Tahun 2013*). The development of student competencies can be through Biology learning, which consists of products and processes.

Biology is able to cultivate attitudes and values on students through learning. Studying Biology will increase the knowledge, skills, attitudes, values, faith and responsibilities of students as citizens to the environment of society and the nation. Biology has the object of study in the form of living things that are microscopic and macroscopic. Macroscopic living things can be seen directly with the sensory organs while microscopic living things are seen with the aid of a

microscope through direct observation with lab work. Practicum becomes a mean of introducing material and equipment which was originally considered abstract to be more real so students better understand the concepts of Biology learning material (Susantini, 2012).

In Biology learning material for grade X there is a Basic Competence (KD) 3.5 which is applying the principle of classification to classify Protista based on the general characteristics of the class and its roles in life through careful and systematic observation and KD 4.5, which is planning and observing characteristics and the roles of Protista in life and present the results of observations in the form of models / charts / images. Furthermore, KD 3.6 is applying the classification principle to classify fungi based on their reproductive characteristics and methods through careful and systematic observation and KD 4.6 is presenting data on observations of the characteristics and roles of fungi in life and the environment in the form of written reports.

Biological learning for Protista and fungi materials based on KD about the aspects of knowledge and skills directs students to make observations in learning, so students are able to classify protista and fungi based on the observations including, general characteristics, ways of reproduction and roles in good life both beneficial and harmful. This KD also requires students to apply the classification principle in classifying protista and fungi based on observed concepts. In accordance with Devi's opinion (2015), protista are included in the material in Biology learning which can be conveyed well through observation activities. The results of the Zunitasari study, et al. (2016) showed that practicum activities on protista material were not carried out properly. This caused students to have difficulties in observing and recognizing protista objects. These difficulties happen because students are not accustomed in observing protista objects directly or through the media. Furthermore, the students' difficulties occur because the objects in protista material have a broad scope, there are similarities between one object with another object so that students have a difficulty in distinguishing it and they do not really understanding the parts that exist on the protista .

Based on the background of the problem discussed, it can be concluded that this study aims to determine the problems and considerations in designing and developing products in the form of an interactive multimedia learning. Describing KI and KD on grade X Biology learning in the 2013 curriculum. It also explains the concepts needed to determine the content and submersion of protist and fungal material.

II. THEORITICAL REVIEW

Media plays a role to help facilitate learning of students and help ease teaching when presenting an abstract concept or a concept that is manifested in concrete or tangible forms (Pujiono et al., 2015).

The use of media can improve learning processes and results because it will affect the level of thinking of students. The level of human thinking follows the stages of development starting from concrete thinking to abstract thinking, starting from simple thinking to complex thinking. The use of teaching media is closely related to the stage of thinking because through the media teaching complex things can be simplified (Sudjana and Rivai, 2011).

Multimedia includes a combination of text, audio, still images, animation, video, and interactivity content (Satyaprakasha et al., 2014). Multimedia can be used to transform abstract concepts into more concrete ones, display objects such as microorganisms that are not visible to the

human eye, and multimedia can overcome the limitations of space, time and energy in displaying complex processes, so that Biology can be taught by teachers and understood by participants students easily (Nugraini et al., 2015). Through this interactive multimedia, abstract concepts can be presented more clearly in learning to make it easier for students to understand learning materials (Widayat et al., 2014).

Some of the reasons that reinforce learning must be supported by interactive multimedia, the message conveyed in the material feels more real because it is presented in plain view. Stimulate various senses so that interactions between senses occur. Visualization in the form of text, images, audio, video and animation will be more able to be remembered and captured by students. Learning is more practical and controlled and save time, cost and energy (Munir, 2012).

III. RESEARCH METHODS

This type of research was a descriptive research using a qualitative approach that was a way to reveal, analyze and explain or describe reality as it is. Some steps of his research were:

1. Analysis of Problems and Needs

At this stage, information was collected about the problems found in Biology learning and determined the characteristics of interactive multimedia learning needed by teachers and students as a tool in learning. Information collection was done through interviews with teachers and students using interview guideline sheets. The results of the analysis of problems and needs were taken into consideration in designing and developing products in the form of interactive learning multimedia.

2. Curriculum Analysis

The analysis was carried out on KI and KD in Biology learning for grade X in the 2013 curriculum. This analysis produced achievement indicators that were appropriate with the learning objectives so that the formulation of the material learned was obtained. The results of the formulation of material carried out in KD 3.5 and 3.6. Activities carried out included analyzing documents using a checklist. The results of this analysis served as guidelines in the development of interactive learning multimedia products.

3. Concept Analysis

Concept analysis aims to determine the content and submissions needed in the development of interactive learning multimedia. This analysis was carried out to identify, detail, and systematically compile concepts that

were needed and used as references in the development of interactive learning multimedia. The steps taken were identifying important concepts found in protista and fungi materials. In the concept analysis the researcher drew on the main concepts that was elaborated in sub-material systematically and linked a concept with other relevant concepts of protist and fungal material.

The data collected through instruments were then analyzed using certain analytical techniques. The analysis technique used in this study was a descriptive statistical analysis. The descriptive statistics were statistics to describe or illustrate objects that were examined through samples or populations. The descriptive statistics can be done without analyzing and making conclusions that apply in general (Sugiyono, 2014).

IV. RESULTS AND DISCUSSION

1. Analysis of Problems and Needs

a. Problem analysis

Based on the results of interviews with Biology teachers and students grade X on the three senior high schools: SMAN 1 2X11 Enam Lingkung on May 5, 2017, SMA INS Kayu Tanam on April 28, 2017, and MAN 1 Padang Pariman on May 8, 2017, It can be concluded that there were obstacles in learning Biology on protista and fungi materials. Firstly, on the protista materials the students have difficulties in finding and observing animal like protista objects through the aid of microscopes in practical activities, this was due to the object of protista species found in limited student environments. The limitations of species objects caused the students have difficulties in finding objects of the species because the students do not necessarily got the object to be observed from the practicum material taken and brought by students in the surrounding environment. Thus, it made the students had difficulties in making observations about the characteristics and presenting the results of observations.

Secondly, on fungi materials the students had difficulties in making direct observations for microscopic and macroscopic fungi. Microscopic fungi were difficult to observe because of the lack of ability of the students to observe and use a microscope. For fungi that were macroscopic due to the limitations of fungi objects found in the environment of students. The limitations of the fungi object caused the students had difficulties in making observations about the characteristics and presenting the results of observations. Thirdly, the students had difficulties in understanding fungi reproduction both sexually and asexually. On fungi reproduction, each fungi division had a

different reproduction, so it was difficult for the students in distinguishing the reproduction from each fungi division.

Fourthly, the media used in the school was in the form of powerpoint which displayed a few images, separated videos and there was no animation for difficult concepts. The media was not equipped with the instructions for using it, the students could not respond or access something according to their wishes so that the media were less effective when the students used it individually.

b. Needs Analysis

Based on this, a solution was needed that can help students and teachers in overcoming the limitations of the objects to be observed and the weaknesses of existing media by presenting media with other variations in learning. The media functioned as a tool in displaying images of protista and fungi objects that were abstracted into reality and reproductive animation / life cycles in protista and fungi material. This was in line with the opinion of Pujiono et al. (2015) says that media plays a role to help facilitate learning of students and help ease teaching when presenting an abstract concept or a concept that will be realized in a concrete or tangible form.

Based on the results of the interactive learning multimedia needs analysis with 60 students, it was found that 100% of the students stated that they liked to learn by listening to sound, 98% of the students said they liked learning by looking at pictures and information, 93% of the students like to learn by looking at moving images, 95% of the students stated that they enjoyed learning by watching videos, 95% of the students said they liked to learn by looking at animation, 100% of the students liked to learn by using media (tools) in the form of sound, images, videos and animation, 88% of the students liked to learn material from one competency learned was contained in one media as a whole, 90% of the students like to learn by using media that could interact with it, 83% of the students wanted to have learning media that can be used for independent learning, 88% of the students liked to use a learning media that provided opportunities to the students to choose the material to be studied, 98% of the students liked if the learning media had practice exercises to test the understanding of the material, 96% of the students liked to do the exercises which after clicking the answer, it showed the response in the form of wrong or correct answers chosen, 95% of the students liked when the students and the teacher finished answering all the exercises about the score they knew, 100% of the students liked it if the learning media had instructions for using it so that it was easy to use.

Based on the results of the need analysis of multimedia also known the colors that students liked. The results of this analysis were that 35% said they liked black, 33% of the students liked light blue, 25% of students liked red, 16% of the students liked the orange color, 28% of the students liked the gray color, 11% of the students like purple, 48% of students like green, 5% of students like dark blue, 21% of the students like pink, 18% of the students like yellow, 46% of the students like bright blue and 10% of the participants students like chocolate.

Moreover it was about the type of writing that students liked. The results of this analysis were 33% stating that they liked the type of Times New Roman, 16% of the students liked the type of writing Cambria (Headings), 13% of the students liked the type of writing Comic Sans MS, 1.6% of the students liked the writing type OCR A Extended, 13% of the students liked the type of writing Tempus Sans ITC, 5% of students liked Agency FB writing types, 10% of the students liked the type of writing Arial Rounded MT Bold, 6% of the students liked the type of Berlin Sans FB writing, 10% of the students liked the type written by Lucida Sans, 3% of the students liked the type of writing Curlz MT.

2. Curriculum Analysis

Curriculum analysis was carried out to find out the Core Competencies (KI) and Basic Competencies (KD) that have been determined in the 2013 curriculum content standards. The results of KI and KD analysis were translated into indicators of learning achievement that students would achieve through interactive multimedia learning for grade X high school students. The results of the analysis were firstly, requiring the ability of the students to be able to apply the principle of classification to classify protista based on the general characteristics of the class and its roles in life through careful and systematic observation.

Secondly, it requires the ability of the students to be able to plan and carry out observations about the characteristics and roles of protista in life and demand the ability of students to be able to present observations in the form of models / charts / images. Thirdly, it required the ability of students to be able to apply the principle of classification to classify fungi based on their reproductive characteristics and methods through careful and systematic observation. Fourthly, it required the ability of the students to be able to present observational data on the characteristics and roles of fungi in life and the environment in the form of written reports.

3. Concept Analysis

Concept analysis aims to identify, detail and formulate the main concepts that will be presented in the study of material in multimedia. Based on the indicators and learning objectives that have been developed, researchers defined the main concepts of protista and fungi materials. The main concepts in protist material were the characteristics of animal-like protista, the characteristics of plant-like protista, the characteristics of fungi-like protista, the role of animal-like protista, the roles of plant-like protista and the role of fungi-like protista. while the main concepts of fungi material were the characteristics of the zygomycota division, the characteristics of the ascomycota division, the divisions of the basidiomycota, the reproduction of the zygomycota division, the reproduction of the ascomycota division, the reproduction of the basidiomycota division, the characteristics and reproduction of the deuteromycota division.

V. CONCLUSION

Based on the results of the data analysis that has been done and from the results of preliminary research it can be stated that: On protista materials the students have difficulties in finding and observing protista objects. On fungi materials the students have difficulties in making direct observations for microscopic and macroscopic fungi and understanding fungi reproduction both sexually and asexually. The media used in the school is in the form of powerpoint which displays a few images, separate videos and there is no animation for difficult concepts. Clearly, there is no any interactive multimedia learning in protista and fungi materials.

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