

Learning Media for Biology Subject Based on Multimedia in Junior High School Level

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Abstract Information is a necessity in this era, so it encourages the advancement of information technology flourish and rapidly, in addition it provides some varieties of ways to catch the users obtaining information and technology. One of the conveniences of that fashion is that students at junior high school can easily access dealing with Biology learning material. Information and technology in the form of multimedia-based software packaged as a media of learning some particulars subjects, in this case they apply to Biology learning. Instructional media provide an overview and understanding to the junior high school students in studying Biology visually, dynamic and interactive. Learning in a visual medium provides visualization interest in studying biology, so students can understand the material SMP comprehensively. An interactive learning media gives the impression that the learning is carried out by two-sided directions, yet the students are invited to participate as creators in studying Biology. Multimedia-based learning media packed into software which capable in presenting the material, in this case is Biology. The material is presented visually and moves dynamically in order to motivate the students in understanding the Biology. The software in multimedia-based learning is purposed to create an autonomous learning system for students. Instructional media built in desktop and run as a single-independent application; therefore, students can run this application even though the internet connection is not available. This instructional media development using object-based method with the waterfall model. This learning media applications built with Adobe Flash Professional CS6 with action script 2.0 for achieving visualization, dynamic, and interactive multimedia-based learning method.

Keywords Learning Media, Visual, Dynamic, Biology, Multimedia

purposes, one of those purposes is for education. Computer devices come with the function to support learning and teaching system. So learning media is increasingly in demand as a tutorial in the learning process that uses computer devices. Computer-based learning media is expected to be part of a teaching and learning process in schools, so computers must be able to be a support tool for the communication process between educators and students in the teaching and learning process, so that these requirements make learning activities well fulfilled[1] [2] [3] [4].

Along with the movement of the times, of course the sophistication of technology such as computers has not become a luxury item anymore. The emergence of computer technology itself has positive and negative sides [5] [6] [7]. The positive side is obtained by using a computer so that children can develop creativity and imagination and train motor nerves. With the advancement of computer technology, the development of learning methods using multimedia-based learning media is felt to be less applied in schools or in multimedia applications about education and entertainment that have been circulating today. For this reason, teaching staff can utilize computer technology according to the needs needed by students [8] [9] [10] [11-21].

Teaching methods in schools so far still apply conventional learning methods. Conventional learning methods are traditional learning methods or also called the lecture method, because from the beginning this method has been used as an oral communication tool between teachers and students in the learning and learning process. In conventional learning methods are usually lectures accompanied by an explanation of learning material. Now it is more useful to use multimedia technology. Interactive multimedia that is currently being developed on the basis that the communication process in learning will be more attractive to students' interests and provide convenience to understand the material because of its interactive presentation. Media elements consisting of text, graphics, photos, animation and sound / music that are presented

1. Introduction

Computers as devices which are used for extensive

interactively in learning media can be interpreted as interactive multimedia media.

The transformation of teaching by using advances in computer technology will be able to assist the task of educators as educators and help grow students' intentions independently, students and help the creativity of students to learn. This must be introduced from the start. With multimedia learning methods students can learn well at home or school about the required subject matter [12] [13] [14].

The teaching pattern has begun to be developed in education in Indonesia. For this reason, this study tries to make a program to help educators in delivering material so that students are more easily understood by multimedia applications through images and sounds that use computer programming languages. As mentioned above, in the field of teaching it is time to use computer technology to facilitate a more dynamic teaching and learning process. Biology subjects are subjects concerning living things, cells, breeding, anatomy and so on. Therefore biology lessons are very important to learn. In the world of education a learning method can be presented using learning aids or often known as learning media. But sometimes the props used are still less attractive because they are less attractive and monotonous [15] [16].

One of the learning methods that can now be developed is by utilizing computer technology as a learning medium. Therefore, by utilizing the ease and completeness of the media available on computers, this software was developed, to help the learning and introduction of the digestive system in humans. Besides that, it also provides an alternative method of learning besides books, such as learning with the help of computers and teachers as instructors, which are expected to be more interesting and interactive compared to ordinary books.

2. Methodology

Learning media are currently being developed. Various software developers have created learning media adopted from physical form learning media into various types of interactive learning media that can be carried out in computers. The interactive learning media currently available are broadly classified using the same parameters, namely using parameters that are less supportive when viewed in terms of performance. For example, there is an incomplete explanation in each material so that the teacher must re-explain the material that has been studied before because many students do not understand. So that the level of difficulty is estimated based on the research of experts in accordance with the level of intelligence of students who use it.

In one learning media there are several types of lessons in the form of educational animation to stimulate students' curiosity and students' interest in learning.

2.1. Formulation of the Problems

The interactive learning media available today are good enough and have a variety of ways to use them. But there are still shortcomings and there are still some problems that often arise, they are:

1. Internal Factors of Learning, from factors there are several that must be studied:

a. Attitudes towards learning

Attitude is the ability to give an assessment of something, which brings itself in accordance with the assessment. An assessment of something gives an attitude of accepting, rejecting or just ignoring it. During the learning process the attitude of students will determine the results of the learning. Students' understanding of learning will lead to a wrong attitude in learning. The attitude of these students will influence it towards the act of learning. Based on the results of research at *SMPN Bintan 2*, there are several forms of learning habits that are often encountered:

- irregular learning
- low durability
- sudden learning preparation
- less complete material record
- always come late

b. Learning Motivation

There is no doubt that encouraging learning has a big role in fostering enthusiasm for students to learn. Because a student despite having high enthusiasm and strong desires, will certainly still be blown by the lazy wind, crushed by reluctance and neglect. So the spirit of this spirit must be maintained continuously. Learning motivation is the mental strength that drives the learning process. Weak motivation or lack of motivation to learn will weaken learning activities. Furthermore, the quality of learning will be low. Therefore learning motivation in students' needs to be strengthened continuously.

c. Learning Concentration

Concentration difficulty is an indicator of learning problems faced by students, because it will be an obstacle in achieving the expected learning outcomes. To help students to be able to concentrate in learning, it certainly takes a long time, in addition to demanding the patience of the teacher.

d. Learning Motivation

In learning activities, the motivation of individuals is manifested in the form of endurance or perseverance in learning, sincerity in listening, doing assignments and so on. Generally less able to study longer, due to lack of seriousness in doing assignments. Therefore, low motivation is a problem in learning that has an impact on the achievement of expected learning outcomes.

e. Managing Teaching Materials

Students experience difficulties in managing materials, meaning that there are learning constraints faced by

students who need teacher assistance. The teacher's assistance should be able to encourage students to have their own ability to continue to manage learning materials, because construction means a process that takes place dynamically.

2. External Learning Factors, which affect the learning process, namely:

a. Teacher

Teachers must develop learning strategies that not only convey information, but also encourage students to learn freely within the boundaries specified as group members.

When in the learning process, the teacher is able to actualize the duties of the teacher well, be able to motivate, guide and provide broad opportunities to gain experience, then students will get strong support to achieve the expected learning outcomes, but if the teacher cannot implement it, students will experience problems that can hinder the achievement of their learning outcomes.

b. Social Environment (Peer Friends)

The social environment can have a positive and negative impact on students. For example, a student named Rudi who is influenced by his peers with the habits of his good colleagues, will have a positive impact and vice versa. On the other hand the social environment can have a positive influence on students. Not a few students who experience an increase in learning outcomes because of the influence of peers who are able to motivate him to learn (Ahmed, Umrani, Qureshi & Sarmad, 2018; Ali & Haseeb, 2019; Haseeb, Abidin, Hye, & Hartani, 2018; Haseeb., 2019; Suryanto, Haseeb, & Hartani, 2018).

c. Facilities and infrastructure

The availability of learning infrastructure and facilities has an impact on the creation of a conducive learning climate. Ease of occurrence for students to get information and sources of learning which in turn can encourage the development of motivation to achieve better learning outcomes. Therefore facilities and infrastructure are an important part of achieving efforts to support the realization of the expected learning process.

3. Result

Based on the analysis that has been carried out, judging

from the analysis of the problems that occur and the progress of information technology at this time it is expected to be able to apply the old system so that all the problems that occur can be immediately addressed properly. That's why an idea arises to make learning media or information delivery media appropriate as a natural science learning tool. So that guidance can be more focused in an effort to find students who have learning difficulties.

Efforts in order to know the success of the assistance that has been given to students and follow-up based on evaluation. This learning media which is a combination of various media such as pictures, sounds, and texts is considered very effective to help students better understand the natural science learning material delivered by the teacher. In this learning media it is also displayed and supported by the display of interesting images in the form of animation so that students do not get bored quickly and feel interested when receiving information provided by this learning media. Besides this learning media can also help the teacher in conveying information or knowledge about natural science.

From the process analysis above, there are several conclusions that can be used in the development of this application, they are:

- a. The need for a learning media that makes students more interested and not boring in learning natural science.
- b. The need for a user friendly learning media that can help teachers deliver natural science and student learning material in natural sciences.
- c. The need for interactive learning about natural science in an interesting and interactive, multimedia-based and portable form that can be used by either the teacher or the student itself.

After entering on this learning media. Next is to choose what kind of learning media material title menu will be displayed. Then the menu will display the available selection of learning media material. Next is choosing the title of the available learning material, namely the title of biology learning material. Then biology learning material will be displayed, namely the excretion system in humans, the reproductive system in humans, the system of coordination and sensory devices in humans, the survival of living things, inheritance and biotechnology. See Figure 1 to see the title of the learning material.

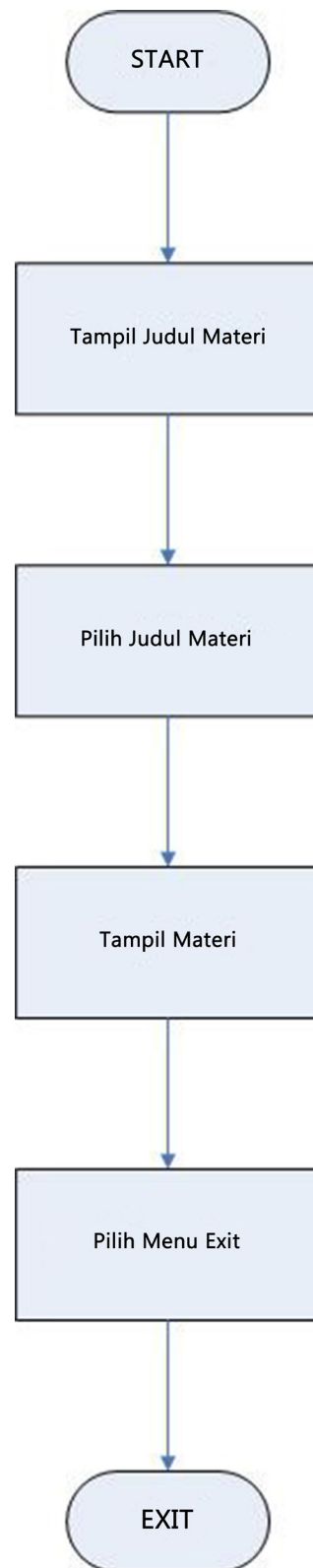


Figure 1. Title of Learning Material

After entering the main menu of learning media, the menu will then display the menu for the choice of biological material. After choosing the title of the material you want to see next, the title of the biology submitter will appear and in each material there are also practice questions related to the material to be displayed. See Figure 2 in the global menu of learning media materials.

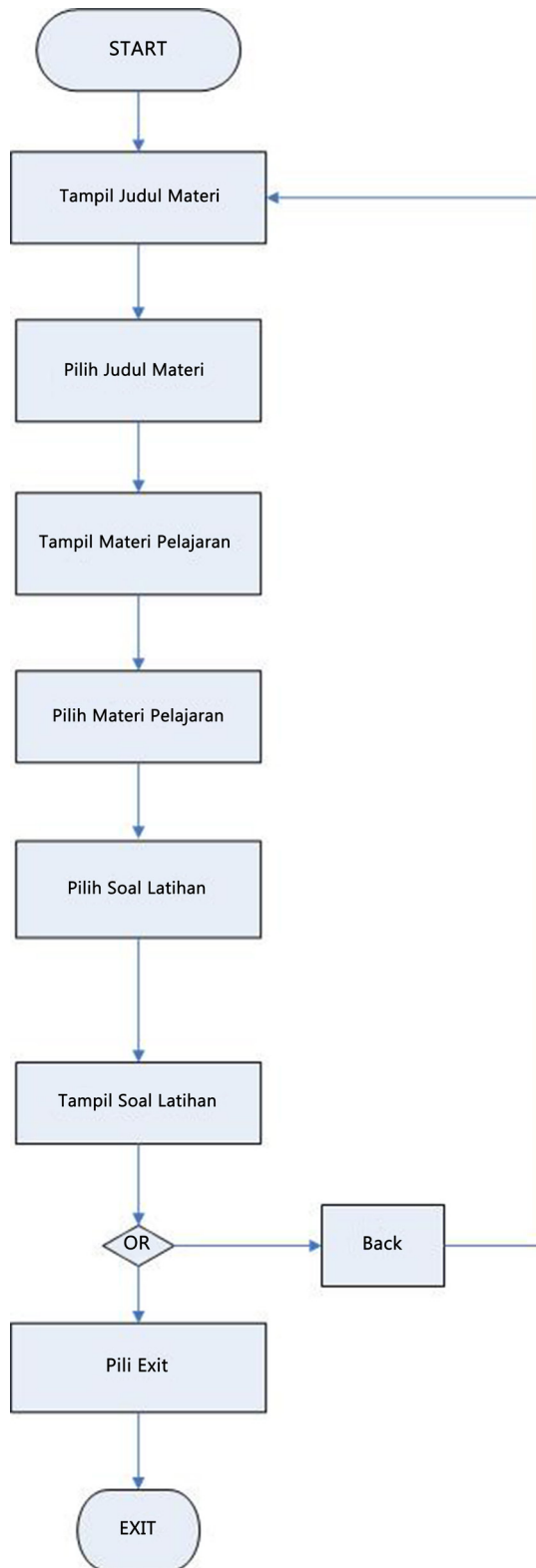


Figure 2. Global Menu Material

Implementation interface of the system built is as follows:

- a. The main page display which is the first page when entering into this learning media there is a page that will connect the user to the next page, namely the sub-material page of Biology learning. On this main page, the user can simply click on the text *"Welcome to the biology learning media for class IX"*, the user will go directly to the next page, see Figure 3.



Figure 3. Menu of Biology Material Interface

- b. The same appearance is also found in other excretory anatomical material and anatomical material of the reproductive system in humans and the anatomical material of the coordination system and sensory organs in humans. In this material, the function and explanation of anatomy can be explained or re-explained by the teacher to the students. Because the explanation contained in this material is only in general and outline so that a description of the teacher is needed to clarify the explanation contained on this page, see Figure 4 below.

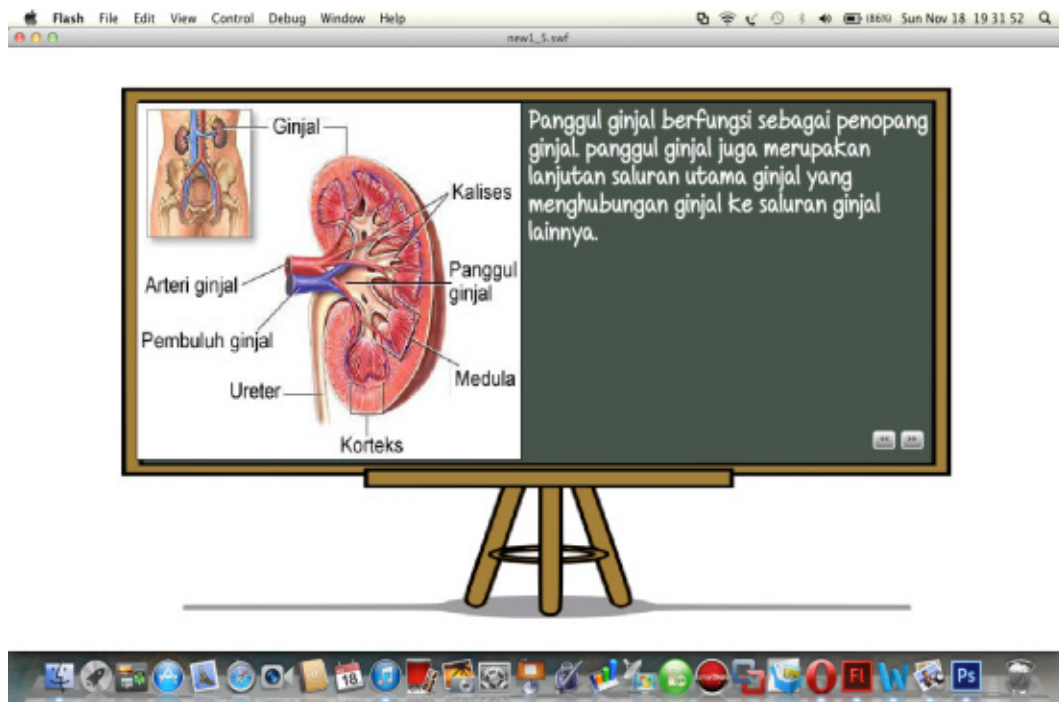


Figure 4. Display for material of Human Excretion

- c. Display for video phase of fetal formation found in reproductive system material in humans. In the video phase of the formation of the fetus there is an explanation of the phases of fetal formation within a few weeks and an explanation of the process of fetal development in the womb. The explanation in the video above is 180 seconds or 3 minutes. There is sound in the video and an explanation in the column next to the video will change according to the phase shown by the video. The teacher or student can repeat the video by sliding the play button on the video. See Figure 5 below.

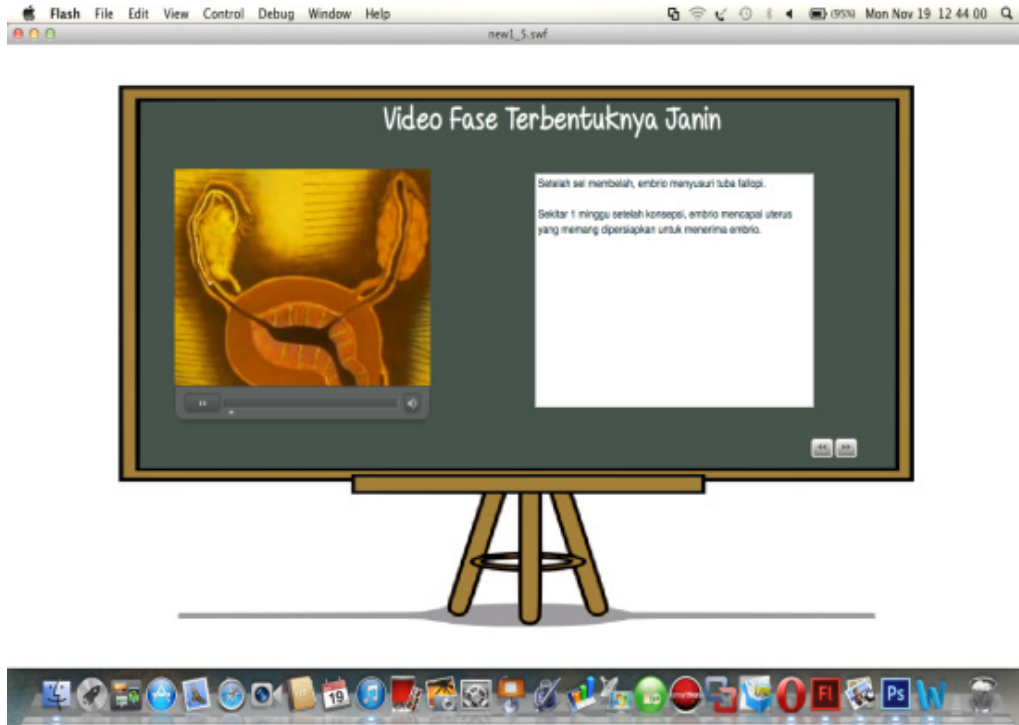


Figure 5. Video for fetus phases

- d. The training page appearance has several practice questions in the form of multiple choice questions related to the material that has been previously presented and displayed. This practice question aims to test students' understanding of the material that has been delivered. These practice questions can be given directly by the teacher to the students, students simply choose one of the answers that is considered correct. The page view will move to the next page. If you have finished working on the practice questions, at the end of the page display there will be a final score of students who have worked on the practice questions. The scoring system in this practice question is found in the action script from the choice of the correct questions, then it will be summed with all the total correct answers. This practice problem still has drawbacks because the teacher must manually record the values obtained by students. If the subject teacher in question wants to add practice questions, you can contact the researcher to add the questions because the practice questions are random and the key is in the action script of the question page. See Figure 6 below.

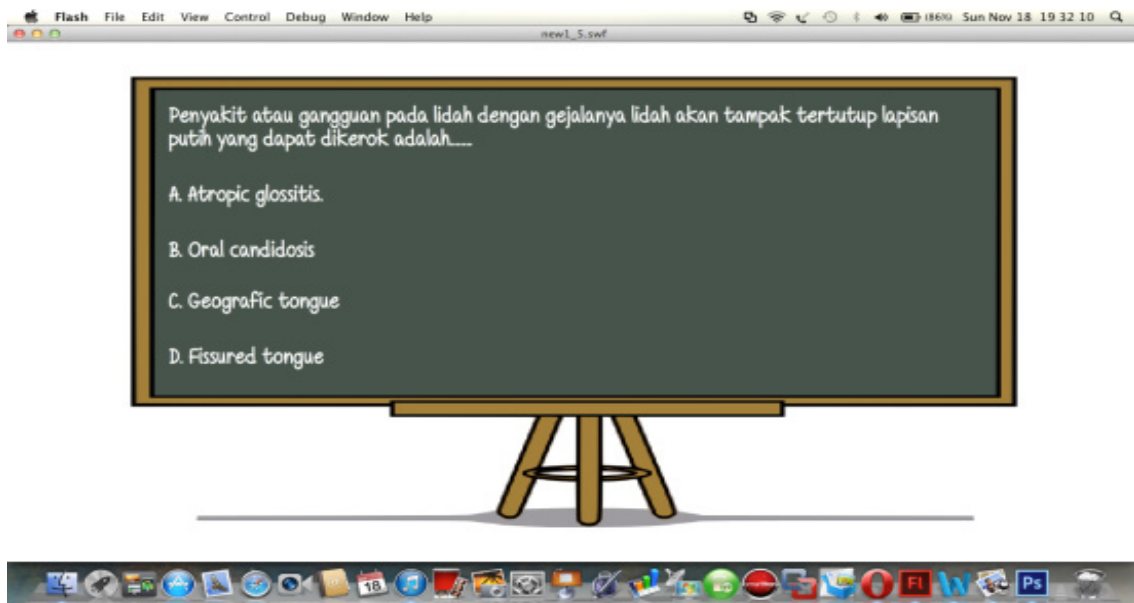


Figure 6. Exercise

4. Conclusions

Learning applications with biological material as natural science are built using animation technology so that students get good understanding of biological material [7]. With this application provides an understanding of biological material visually so students are invited to predict or analyze biological material properly [8].

Learning applications made for natural science material, especially biology, are more animated and interactive so students can respond to the material presented by the application. Likewise, the teachers feel helped in delivering biological material in the learning and teaching process.

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