9th International Seminar of Research Month 2024
Volume 2025
http://dx.doi.org/10.11594/nstp.2025.47122

NST Proceedings
OPEN ACCESS

Conference Paper

Website-based Interactive Learning Animation Design for Grade 11 Biology Subject Degistive System

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ABSTRACT

In the learning process, Biology is often faced with material that is difficult to visualize because basically, Biology lessons need visuals that explain the material, especially on the digestive system material because this process is in the body contained in the body. Learning media is also needed, but if only in the form of a video, it is less effective because of the lack of visual clarity delivered. In this case, the researcher develops research that has been made previously (Fariz, 2021) entitled "Interactive Learning Animation Based on 11th Grade Biology Website Respiratory System". In this development, researchers will add to the advantages of previous researchers by developing a visual level of animation and interaction system that is expected to be attractive to increase student interest in learning which can be accessed via the website so that it can be used anywhere and anytime.

Keywords: Animation, website, Biology learning

Introduction

Biology is the study of everything about living things. Biology makes living things the object and humans the subject. In everyday life, humans experience phenomena or symptoms of life that are then attached to the heart, in the mind, and remembered in memory. Thus, the formation of what is called "knowledge by experience" (Syamsurizal, 2005).

The digestive system is one of the 11th grade biology materials that discuss the process of digestion in humans, disorders or diseases of the food digestive system, the digestive system in animals, food digestion tools, food substances and their functions. In other words, digestive system material is about how the body processes the food we eat, from the mouth to the disposal of the remains. This includes organs such as the mouth, stomach, and intestines, as well as chemical and mechanical digestive processes. It also discusses the importance of a healthy diet and digestive health problems (Suwarno, 2009).

In the Biology learning process, students are often faced with material that cannot be visualized directly so students sometimes have difficulty in understanding, especially in the digestive system material because the process occurs in the human body (Mukti & Nurcahyo, 2017). Based on the results of research (Cimer, 2012) regarding difficulties and ways to improve Biology learning (in the view of students), many students suggest using visual learning media (Daud & Rahmadana, 2015). According to research conducted by (Udi and Liss, 2020), interactive learning media can improve student learning outcomes better than non-interactive learning media. In addition, interesting learning media that motivate students to learn independently are website media connected to the internet network that can attract attention and keep students awake in paying attention and are easy to access via the internet (Daud & Rahmadana, 2015).

Animation is the process of recording and playing back a series of moving images. Animation is often used because animation itself has an element of interest that can help people who have low memory ability. Therefore, animation as a learning media can improve students in lessons

How to cite:
Setiawan, F. H., Yurisma, D. Y., & Martono, S. (2025). Website-based Interactive Learning Animation Design for Grade 11 Biology Subject Degistive System . *9th International Seminar of Research Month 2024*. NST Proceedings. pages 801-804. doi: 10.11594/nstp.2025.47122

that require visuals. Interactive learning animations can attract attention, and can make the learning atmosphere varied and more fun (Titin & Resti, 2021). The most important characteristic of interactive learning media is that students not only pay attention to the material presented, but students are forced to interact during the lesson.

In this case, the researcher develops research that has been made previously by Fariz (2021) entitled "Interactive Learning Animation Based on 11th Grade Biology Website Respiratory System".

Figure 1. Website of previous researchers (Source: biolandclass.com)

In this development, researchers will add the advantages of previous researchers by developing a visual level of animation and interaction system that is expected to be attractive to increase student interest in learning which can be accessed via the web so that it can be used anywhere and anytime. In addition, it is hoped that it can assist teachers in providing visualization of the material given to students, which can help students understand the material and provide convenience in the teaching and learning process.

Material and Methods

Data Collection Methods

Making this final project, researchers conducted various ways to collect data. Some of the methods used by related researchers such as observation, interviews, and literature studies.

Observation

Observation is an observation activity, paying attention to an object that aims to understand and obtain information. This data collection technique is useful for collecting various behavioral data or social interactions (Tutik, 2017). In this study. Researchers used this collection technique on SMAN 16 students to find out the learning media used by high school students today.

Interview

Interview is a data collection method that is carried out by interacting with sources. Interviews can be conducted in various ways, both directly and indirectly with sources. In simple terms, it can be said that an interview is a process of interaction between the interviewer and the source of information through direct communication or can be said to be a face-to-face conversation between the interviewer and the source of information. The results of the information obtained will be quite better if done properly and correctly because the interviewer can ask the source again for incomplete answers (Makbul, 2021). In this research, the researcher conducted an interview session with a high school Biology teacher at SMAN 16 Surabaya regarding the learning media currently used. And interviews with 5 students to find out the effectiveness of the learning media currently used. The following is the conclusion of the responses of the five respondents based on the Digestive System material they have learned:

- All respondents had been taught Digestive System material before.
- All respondents found it difficult to memorize and understand the Digestive System material.
- All respondents were taught using learning media in the form of PPT and video by the teacher.
- All respondents revealed that the material presented was sometimes unclear about the visuals. So, it is difficult to understand and memorize.
- All respondents agreed that using interactive web-based animated learning media can facilitate understanding of the material.

From this it can be concluded that Biology students and teachers need interesting learning media with that Biology students and teachers think that the ideas that researchers propose can help in the learning process because interactive animation can help in memorizing the material. In addition, because it is in the form of a website, the material can be accessed at any time with the internet easily.

Work design method

The method used in this research is the multimedia development life cycle (MDLC) method. This method has six stages, namely:

Concept

The concept stage in the multimedia development life cycle is the stage where researchers determine the concept. The making of this website-based interactive learning animation for Biology class 11 aims to facilitate student learning in understanding the material and facilitate the teacher in the teaching process.

Design

The design stage is the stage where making a theme, idea, design display that will be made into an interactive learning animation website later. At this stage, researchers create storyboards to describe the layout of the website, asset sketches, website mockups using Adobe Illustrator and Adobe XD software, which then the assets will be animated using After Effect software.

Content

At this stage, information on materials obtained from the results of literature studies on digestive system material, discussions with Biology teachers, and collection of materials consisting of animations and images.

Literature Study

After conducting the data collection stage, continued with the literature study. At this stage, there is again a process of collecting information about the material to be raised, namely the Digestive System. This material was obtained from the Biology Textbook for SMA-MA Class 11 Independent Curriculum, published by the Ministry of Education, Culture, Research and Technology. In addition, other information was also obtained from related journals.

Assembly

The assembly stage is carried out after all objects or materials are made. Start making a website that matches the storyboard using wordpress, and use the h5p plugin.

Testing

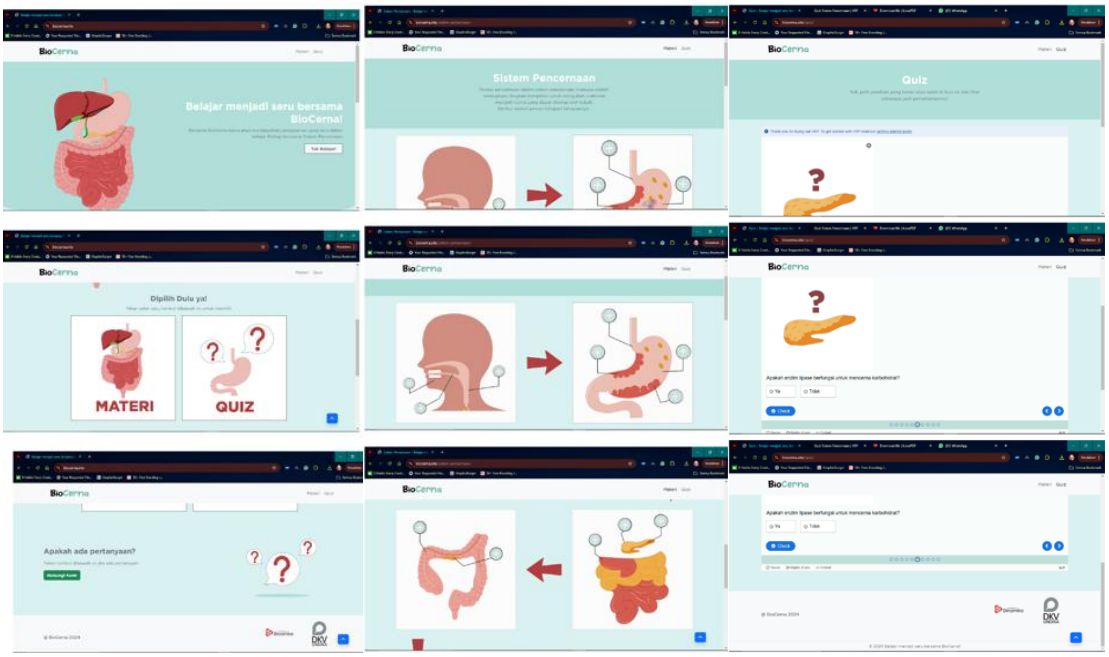
After the assembly stage is complete, the material that has been made on the website will be tested using the Participatory Design method, namely to the same respondents as the interview process, namely five 11th grade high school students from SMAN 16 Surabaya. A review is also conducted to the teacher, expert illustrator, and animator to see whether the material and

animation on the website are feasible and run well or not. This test will be carried out using the Black Box method, which is testing to find out whether all software functions have run properly in accordance with their functional requirements.

Results and Discussion

BioCerna website

This BioCerna interactive learning animation website contains material on the Biology of the Digestive System on the page there are two options, namely "Material" where the material is presented with an interactive animation where if you press the '+' button, it will display a pop out explanation of the material while the 'Quiz' option will display a quiz. Button will display a pop out explanation of the material while the "Quiz" option will display a quiz with true or false choices which will be displayed on the page. With true or false choices which will train students' understanding of the material.



Source: biocerna.site

Figure 2. Homepage and pages of BioCerna website

Conclusion

After the learning website was completed, the website was tested with a biology teacher and 5 high school students. The result is that the website is considered to be able to improve the learning process of students and can facilitate teaching Biology teachers.

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