

Development of Interactive Video Media Based on Discovery Learning Model on Food Digestive System Class XI to Increase Student Learning Outcomes

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Abstrak:

Tujuan penelitian ini adalah mengembangkan dan mendeskripsikan media video interaktif berbasis model *discovery learning* pada sistem pencernaan makanan kelas XI untuk meningkatkan hasil belajar peserta didik yang valid, praktis, dan efektif. Jenis penelitian yang digunakan dalam penelitian ini adalah model pengembangan ADDIE, yaitu (1) Analisis, (2) Desain, (3) Pengembangan, (4) Implementasi, (5) Evaluasi. Tahap uji coba terbatas dilakukan di kelas XII MIPA 4 dan tahap uji coba lapangan dilakukan di kelas XI MIPA 1 SMA Negeri 5 Bandar Lampung. Hasil penelitian menunjukkan bahwa produk pengembangan media video interaktif berbasis model *discovery learning* pada sistem pencernaan makanan kelas XI mendapat skor rata-rata 90% (sangat valid), ahli media 91% (sangat valid). Untuk angket kepraktisan, skor rata-rata untuk tes terbatas respon peserta didik mendapat skor rata-rata 93,25% (sangat praktis) dan tes lapangan angket respon peserta didik mendapat skor rata-rata 92,40% (sangat praktis). Pada tahap uji coba lapangan, hasil belajar memperoleh skor rata-rata 0,71% (sangat efektif). Dapat disimpulkan bahwa pengembangan media video interaktif berbasis model *discovery learning* pada sistem pencernaan makanan kelas XI untuk meningkatkan hasil belajar peserta didik layak digunakan dalam pembelajaran.

Kata Kunci : Media Video Interaktif, Model Discovery Learning, Hasil Belajar Peserta Didik

Abstract:

The purpose of this study was to develop and describe interactive video media based on discovery learning models in the food digestive system of class XI to improve student learning outcomes that were valid, practical, and effective. The type of research used in this study is the ADDIE development model, namely (1) Analysis, (2) Design, (3) Development, (4) Implementation, (5) Evaluation. The limited trial phase was carried out in class XII MIPA 4 and the field trial phase was carried out in class XI MIPA 1 SMA Negeri 5 Bandar Lampung. The results showed that the product of developing interactive video media based on the discovery learning model in the food digestive system of class XI got an average score of 90% (very valid), media experts 91% (very valid). For the practicality questionnaire, the average score for the limited test students' responses got an average score of 93.25% (very practical) and the field test student response questionnaires got an average score of 92.40% (very practical). At the field trial stage, the learning outcomes got an average score of 0.71% (very effective). It can be concluded that the development of interactive video media based on the discovery learning model on the food digestive system for class XI to improve student learning outcomes is feasible to use in learning.

Keywords : Interactive Video Media, Discovery Learning Model, Student Learning Outcomes

Introduction

Education in learning is a process of changing the attitudes and behavior of a person or group of people in an effort to mature humans through teaching and training efforts that are in accordance with the educational procedures themselves. Through education, children can develop aspects of knowledge (cognitive), attitudes (affective), and skills (psychomotor).. (Andriyani & Suniasih, 2021; Hisby & Kosasih, 2020; Winoto & Prasetyo, 2020).

Education is an effort to shape the character of students to become better individuals in Law no. 20 of 2003 concerning the National Education System Chapter 1 Article 1 Paragraph 1 states that: "Education is a conscious and planned effort to create a learning

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atmosphere and learning process, so that students actively develop their potential to have religious spiritual strength, personality self-control, intelligence, noble character, and skills needed by himself, society, nation and state (Dediknas Law No. 20 of 2003). Education can be obtained from formal, non-formal, and informal education. Education is a process that cannot be abandoned by humans. In a knowledge transfer process, many things are needed, including teachers and teaching aids during the learning process. Education can also be a good vehicle for a country to build the human resources needed for every student to be able to develop themselves according to their potential (Chaerudin, 2019:1). This is certainly a challenge for the government to continue to improve and develop the quality of education for the better. The success of an education can be through a fun learning process (Estiani et al., 2015; Sudiarta & Sadra, 2016). Learning is also expected to improve learning outcomes. Learning itself does not only include mastery of subject matter, but includes habits, pleasures, interests, talents, adjustment to the environment, skills, desires and aspirations. (Sugiartini et al., 2019; Widayanti et al., 2020). Learning outcomes are the results of an assessment of the ability of students who are determined in the form of numbers after undergoing the learning process (Sahiu, S., & Wijaya, 2017). The use of numbers on certain test results is intended to determine the absorption of students after receiving the subject matter (Bungsu et al., 2018; Wali et al., 2020).

However, the current reality is that the components that can improve the quality of education have not been fully fulfilled in every school (Pertiwi et al., 2019; Widiatmika et al., 2017). This results in low student learning outcomes. A less pleasant and less meaningful learning atmosphere can affect student learning outcomes. In addition, student learning outcomes in the affective and psychomotor domains are still included in the poor category (Lidyawati et al., 2017; Muthoharoh et al., 2017). In the implementation of learning in schools, there are still teachers who use conventional methods in the process of teaching and learning activities, namely delivering material only by the lecture method in front of the class (Sadikin & Hamidah, 2020; Wahyono et al., 2020). The conventional learning process can make students less interested and less motivated to learn (Mustaqim & Wijayanti, 2019; Widiana, 2016). The problems that have been revealed from several studies also occur in SMA Negeri 5 Bandar Lampung. Based on the results of observations and interviews that researchers have conducted at SMA Negeri 5 Bandar Lampung, information is obtained that the learning outcomes of class XI MIPA students in Biology are still less than optimal, where this is indicated by the large number of student scores who have not reached the criteria for completeness. minimum (KKM). The lack of student learning outcomes is influenced by several factors, the first is the factor of facilities and infrastructure that have not been used optimally. SMA Negeri 5 Bandar Lampung has adequate facilities for learning such as LCD and projectors, and a computer laboratory. Facilities and infrastructure that are quite complete can actually be used by teachers to facilitate the learning process, such as the use of learning media. But in reality the facilities provided are not utilized optimally by the teacher. The second factor is that for some students, Biology learning is an unattractive learning because the learning is still conventional. Teachers in the learning process still use conventional methods, where the delivery process of teachers in the classroom is mostly still using the lecture method and taking notes on the blackboard. Teachers rely on textbooks available at schools to deliver subject matter in class without using learning media as a support. This happens because the teacher is not yet fluent or does not have the ability to create their own learning media. In addition, teachers also do not have much time to be creative in creating learning media, because the teacher's time outside of school is more busy with making lesson plans and others.

Technological developments show that the advancement of the digital era has expanded the learning process and allowed a higher level of student interaction to make

learning more meaningful and overcome deficiencies in rote learning. Integrating technology in the learning process is very important in today's digital era so that educators not only have content components and pedagogical knowledge but also have the ability to integrate these two components with technology (Agustini, et al., 2019). Technology provides changes in education, providing new innovations in the teaching and learning process. One of the technologies is learning media, with the increasing variety of learning media following the development of today's technology, educators get a variety of optional (choices) in the process of implementing teaching and learning programs both in the classroom and outside the classroom. The use of learning media in the teaching and learning process can generate new desires and interests, generate motivation for learning activities, and even bring psychological influences on students (Arsyad, 2019).

In learning activities, learning media is needed to support the process of teaching and learning activities in the classroom. Media is an intermediary to convey messages (Dewi & Handayani, 2021; Suryana & Hijriani, 2021). With the learning media, students can be motivated and show interest in understanding the material presented by the teacher. One of the media that can be used is learning media in the form of video. Learning videos can make it easier for students to understand the material, so that it can increase students' interest in learning (Heo & Toomey, 2020; Tegeh et al., 2019; Yusnia, 2019). Video is one of the media that contains audio and visual elements. Through video media, students will be able to understand subject matter that is still abstract because of the nature of videos that can convey concrete messages (Andriyani & Suniasih, 2021; Soucy et al., 2016; Taqiya et al., 2019).

Video learning as a medium that acts as an introduction to information from the teacher to the child. The word video comes from an English abbreviation, namely visual and audio (Limbong, Tonni & Simarmata; 2020). The word Vi stands for visual which means image, the word Deo stands for audio which means sound. With audio visuals, children can see real actions from what is contained in the media, this is able to stimulate children's learning motivation (Putu, Sudarma, & Yuda, 2019). Furthermore, the advantage of using audio-visual in learning is that the message or material conveyed is easy to understand, understand and store in memory so that it will have a significant effect on learning outcomes in children's cognitive, affective, and psychomotor domains (Pradilasari, 2019). Besides that, it can overcome the limitations of distance and time, and can be repeated to improve understanding. In its use, video is a collection of several components that function as sending sound and moving images (Asmoro, 2019).

The use of learning video media can stimulate children's motivation to learn. It is also stated that (Rismark, Marit & Selvberg, 2019) studies show that video can also function well as a means to encourage learners. Because there is a child's curiosity about the video that is displayed so that it can increase children's understanding of the material provided (Kirana, 2016). Learning videos are also packaged in an attractive way using interactive multimedia displays that have been designed so that the appearance can fulfill its function, namely by informing a message that is equipped with a controller that can be operated by the user (children). Interactive multimedia-based learning videos are media that can involve children's experiences directly by involving all senses. This will stimulate and increase the motivation of students in learning. The findings of previous studies stated that video media can be used in the learning process (Indahini et al., 2018; Krishna et al., 2015; Novita & Pratama, 2019). The influence of video media on student learning outcomes (Busyaeri et al., 2016; Jatmiko et al., 2017). Research findings (Fauziah, Wahyuningsih & Hafidah, 2020) state that children's language development by using learning videos to improve listening and speaking skills in receiving and expressing their language, as evidenced by children's enthusiasm to convey material content and listening skills from the initial results that originally got the result of 62.25 then increased to 81.45 with the level of validity of the

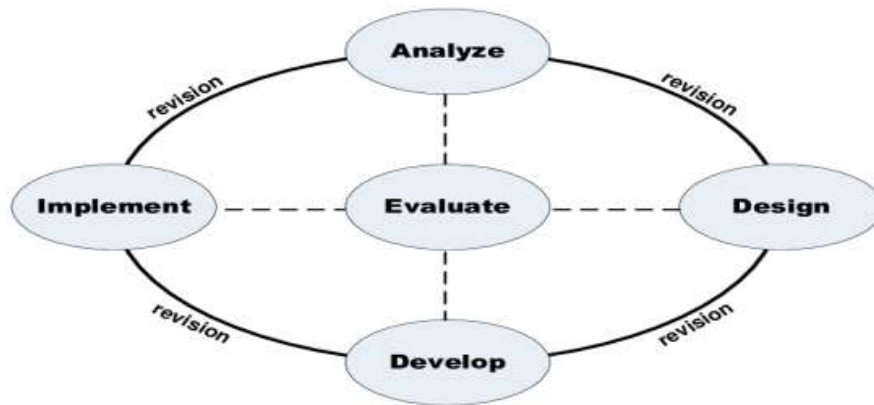
learning video media of 85%. Other research was also carried out (Putra, 2015) the results of the study were seen in the presentation of attractive media images and animations, making it easier for children to remember the material, children seemed enthusiastic about participating in learning using interactive multimedia learning. Furthermore, research also conducted by (Suseno, Putri et al., 2020) interactive multimedia-based video learning media was declared valid based on expert assessments both in terms of media and material substance. In its application, more than 70% of students received positive responses who participated in the learning process. Interactive learning multimedia is very effective for children's learning, because it has various features or special menus to be accessed by users, to be able to bring up information in the form of audio and visual, animation, text, and other features. This is in line with research conducted by (Karimah, 2020).

In addition, teaching and learning activities also require a learning model to suit the learning objectives that have been set by the teacher. With various kinds of learning models, it is hoped that teachers can use them in teaching and learning activities in the classroom (Meyer et al., 2019; Nurhayati et al., 2018). Associated with the use of the existing model because it has a considerable influence on improving student learning outcomes. So the researchers conducted research with the discovery learning model because the students' own discoveries sometimes gave different perceptions. The research was conducted using meta-analysis research that collected data from various other studies and then concluded whether the discovery learning model could improve student learning outcomes. The Discovery learning model is a learning theory defined as a learning process that occurs when students are not presented with lessons in their final form, but are expected to organize themselves (Durajad; 2008). The discovery learning model is a learning that involves students in problem solving for the development of knowledge and skills (Effendi; 2012).

Therefore, teachers must be willing to innovate with learning media and learning models that can support the process of learning activities. From the research that has been done, there is a relationship between video learning media and the learning outcomes of elementary school students. Therefore, this study aims to analyze the effect of developing and describing interactive video media based on the discovery learning model on the food digestive system for class XI to improve student learning outcomes. Interactive video media based on the discovery learning model is expected to facilitate and increase interest and motivation to learn so as to improve student learning outcomes.

Method

The type of research used is research and development. Research and development is a research method used to produce certain products and test the effectiveness of these methods (Maria, Rusilowati, 2019). This method was chosen because the researcher wanted to produce a product in the form of interactive multimedia-based learning videos to improve children's listening skills. Researchers conduct research and development with the ADDIE model that has been developed by (Rusdi, 2018). ADDIE is a model that is easy to use and can be applied in curricula that teach knowledge, skills or attitudes. The research procedure in research and development using the ADDIE model has five stages that must be carried out, including: analyze, design, development, implementation, evaluation. The following is the design stage of the ADDIE model.



Gambar 1. Tahapan Model ADDIE (Rusdi, 2018)

The ADDIE development model is a guideline in building training tools and infrastructure that is effective, dynamic and supports the performance of the training itself. The purpose of using this method and model is to produce a product that is developed and then tested for feasibility in order to find out the effectiveness of interactive video media based on the discovery learning model. This product is expected to improve student learning outcomes.

The research subjects consisted of the subject of the product development process and the subject of product development trials. The subjects of the product development process were two design experts, three materials experts and two media experts. The subjects in this study were ICT teachers and Biology subjects and students at SMA Negeri 5 Bandar Lampung. The subject of the product development trial was 1 class, namely class XI MIPA 1 which applied interactive video based on the discovery learning model to the food digestion system material to improve student learning outcomes carried out by researchers. The research design used in the research product trial was a pre-experimental design with the type of One-Group Pretest-Posttest Design. According to Creswell (2019) that the One-Group Pretest-Posttest Design type includes one group that is observed at the pre-test stage which is then treated and at the end of the post-test. In the experimental model in this study, a group was given a pretest (O1) and then given treatment (treatment) by applying an interactive video based on discovery learning models on the food digestive system material (X) and then giving a final test (Posttest) (O2).

Data collection techniques used in the development of this media are various instruments. The instrument to be implemented has been validated by the instrument validator. The steps in compiling a validation sheet are: (1) determining the aspects to be assessed, (2) describing developmental aspects in the form of indicators, (3) compiling statement items based on indicators, (4) consulting the validation sheet with supervisors, (5) provide validation sheets to the validator, (6) analyze the results of the validation. Research instruments are guidelines or tools used in data collection to collect data obtained by researchers. This study uses an instrument to measure the validity, feasibility, and effectiveness of the development of interactive video based on the discovery learning model developed by the researcher. This development uses research instruments in the form of questionnaires/questionnaires, test questions, and documentation.

Results and Discussion

In this development research, several results will be described, namely the presentation of data and data analysis, revision of product development, and discussion of product development.

1. Data Presentation and Data Analysis

The product feasibility test was carried out in two stages, namely the validity test stage and the practicality test stage. The validity test stage was carried out by two media and material experts and two SMA Negeri 5 Bandar Lampung teachers as learning media practitioners. These experts and practitioners are people who have experience in product development and high school teaching experience. The practicality test was carried out by the teacher through the analysis of the observation sheet in the form of a questionnaire. After the product is declared feasible, then proceed to the effectiveness test phase in order to determine the level of comparison of the data on cognitive learning outcomes of students through learning before and after using interactive video based on discovery learning models. The following are the results of research on the development of interactive videos based on discovery learning models, namely the percentage of obtaining validation results obtained from experts, namely material experts with an average percentage value of 90% or can be categorized as very valid, while the average value of the percentage of media experts is 91%. categorized as very valid. While the gains obtained are based on the results of practicality tests obtained from the results of practitioners' responses to students. The results of the responses of students of class XII MIPA 4 SMA Negeri 5 Bandar Lampung get a percentage value of 93.25% with a very practical score criterion, while the results of the responses of students in class XI MIPA 1 SMA Negeri 5 Bandar Lampung get a percentage value of 92.30% with a score criterion very practical, so these results strongly support the development of interactive videos based on discovery learning models that will be used by students as infrastructure in the learning process.

2. Product Development Revision

Product revision at this stage is to perfect the product that has been made. Revisions are made with references obtained from the input of the validators. At this stage the researcher only made a few revisions, namely in terms of the background on the media.

3. Product Development Discussion

In this study, the model used by the researcher refers to the development model proposed by Borg and Gall, namely the ADDIE model (Analysis-Design-Develop-Implement-Evaluate) which is one of the more generic learning design models. The ADDIE development model is a research method used to produce certain products and test the validity, practicality and effectiveness of these products with several stages, namely, analysis, design, development, implementation and evaluation. This development research uses the ADDIE model developed by Reiser (2001) and Molenda (2003) to produce learning media products in the form of interactive videos based on discovery learning models. There are new findings found in the field as evidenced by the fact that it is clear that using media in the learning process can help teachers in the process of delivering material to students, so that all materials are more easily understood by students, and the learning process is more interesting, and fun for students. This is in line with the opinion of Rosyid, Sad'diyah and Septiana (2019: 8). The use of learning media can not only simplify and streamline the learning process, but also can make the learning process more interesting (Sanjaya, 2009:162).

The following are the results of research on the development of interactive videos based on discovery learning models, namely the percentage of obtaining validation results obtained from experts, namely material experts with an average percentage value of 90% or can be categorized as very valid, while the average value of the percentage of media experts is 91%. categorized as very valid. While the gains obtained are based on the results of practicality tests obtained from the results of practitioners' responses to students. The results of the responses of students of class XII MIPA 4 SMA Negeri 5 Bandar Lampung get a percentage value of 93.25% with a very practical score criterion, while the results of the responses of students XI MIPA 1 SMA Negeri 5 Bandar Lampung get a percentage value of 92.30% with a very high score criterion. practical, so these results strongly support the development of interactive videos based on discovery learning models that will be used by students as infrastructure in the learning process.

Conclusion

This research and development produces learning media products in the form of interactive videos based on discovery learning models. The development model used in this study is the ADDIE model (analysis, design, development, implementation & evaluation). The material discussed in the development of interactive videos based on discovery learning models is the food digestion system for class XI MIPA. Interactive video media based on the discovery learning model will be directly applied by the teacher. The results of the assessment by material experts regarding the completeness or quality of the material in the interactive video based on the discovery learning model obtained a validator value with an average value of 90%. It can be said that the interactive video based on the discovery learning model is in the very valid category. The results of the assessment by media experts regarding the quality of interactive video based on discovery learning models obtained values from the validator results with an average value of 91%. It can be said that interactive videos based on discovery learning models are in the very valid category. While the gains obtained are based on the results of the practicality test obtained from the results of the student responses of SMA Negeri 5 Bandar Lampung by getting a percentage value of 93.25% with very practical score criteria and the results of the responses of students at SMA Negeri 5 Bandar Lampung getting a percentage value of 92.30 % with very practical score criteria. With the results obtained by the value of interactive video based on the discovery learning model, it can be said that the media developed by researchers can help students in the learning process.

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