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Interactive Multimedia Design To Recognize Properties Of Objects Using The ADDIE Method

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ABSTRACT

Natural Sciences is a compulsory subject at SDN 24 Dauh Puri which is theoretical subject, but teachers are required to provide real examples to easily understand. While material properties of objects are difficult to practice, and teachers only provide explanations without examples. This causes students become less understanding and bored with the material properties of objects. So we need to design an interactive multimedia using ADDIE method that serves to visualize the material properties of objects with examples so that students can understand more easily. The results of the system test questionnaire showed that 90.63% of students liked this learning media, 91.64% of students liked the pictures on this learning media, 91.13% of students liked the color in this learning media, 82.53% of students said they could use the media. In this learning, 96% of students know the nature of air, 100% of students know what objects are soluble in water, 97% of students know how the shape changes due to the combustion process, 100% of students know what materials are not easily broken, 100% of students know the nature of the material. of wood, and 87% of students know the raw materials for making paper.

1. Introduction

Elementary school (SD) as a place to gain knowledge plays a very important role in building the nation's young character. At the elementary school level, students are considered to be able to be independent and dare to socialize with their environment without being monitored and accompanied by their parents again [1]. Because of this, elementary school becomes a place for students to find their character in playing, making friends, and learning. Learning is the main goal in elementary school. In the learning process teachers are required to be able to create an interesting, effective and educative teaching and learning process in order to achieve the objectives of the optimal teaching and learning process as expected. In addition, the interaction of teachers with students, students with students and the media used in the teaching and learning process as well as the subject matter are things that are no less important in supporting the achievement of these goals.

In elementary school education, especially at SDN 24 Dauh Puri, natural science subjects are compulsory subjects to be studied, these subjects have been taught from grade 1 even though it is only an initial introduction. This shows how important natural science subjects are in elementary school. Natural science subjects are a science which contains scientific theories of knowledge about nature and is closely related to human life.[1]. Although natural science subjects are theoretical subjects, in the teaching and learning process teachers are required to be able to provide real examples to students so that students can more easily understand the materials in natural science subjects, while for some materials on natural science subjects, it will be difficult to give examples to students with the practicum method because it is constrained by the long process to see the results of the practicum and the lack of teaching aids, especially at SDN 24

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Dauh Puri. Material properties of objects is one of the natural science subject matter that is difficult to practice, so that so far the teacher only provides explanations with the lecture method or direct exposure assisted by textbooks and student worksheets (LKS), the teacher also provides examples only with objects that are around the classroom without actually practicing this material in detail. This causes students to be less understanding and tend to get bored with the material. This can be seen from the learning outcomes of 3rd grade students at SDN 24 Dauh Puri which the author obtained from the 3rd grade homeroom teacher that the grade 3 students' grades in semester 1 only reached an average value of 77 for natural science subjects. Meanwhile, especially for the material raised in this study, namely the material properties of objects, on the daily test of grade 3 students, only 25% got a score above 70 and the rest were still below the number 70.

This explains that students still do not understand natural science subjects, especially the material properties of objects. So for these reasons, an interactive multimedia-based learning media is needed to assist teachers in explaining and conveying material properties of objects without having to do practicum which takes a long time to see the results of the practicum. Interactive multimedia is a medium that can be used in various fields of study at various levels of education. This media is interactive which means it can carry out two-way communication or have reciprocity from humans or users to interactive multimedia and from interactive multimedia to humans or users[2][3].

In addition to being interactive, this media is also multimedia in which there are complete multimedia elements including sound, animation, text, and graphics. In this form, it is believed that the subject matter will be more interesting to learn. The use of animation techniques is able to make the subject matter more clear and real[4]. Based on the description above, the authors are interested in conducting research on "Designing Learning Media for Recognizing the Properties of Objects Based on Interactive Multimedia (Case Study: SDN 24 Dauh Puri)". Multimedia comes from two words, namely the word multi and the word media. Multi has many meanings and media can be interpreted as a tool to convey something or display something such as text, images, graphics, sound, music, and so on. According to Munir, interactive is two-way communication or more of the components of communication [5].

The communication component in interactive (computer-based) multimedia is the relationship between humans (as users / users of products and computers (software / applications / products) in certain file formats, usually in the form of CDs). So that the expected product/CD/application can have a two-way or reciprocal relationship between the software/application and its users. Interactive multimedia as a result of the development of information technology provides an opportunity to be engineered and developed into a learning resource that is able to meet the needs of students and at the same time develop various aspects of learning[6][7]. The development model used in the design of learning media for the introduction of the properties of this object is ADDIE. The selection of this model is based on several considerations. First, the ADDIE model is presented in a simple and systematic way. The stages in this model are very simple when compared to other design models[8]. Its simple and systematically structured nature makes the ADDIE model very easy to learn by developers [9]. Second, the ADDIE model is relevant in developing an interactive multimedia design[10][11]. Third, the research results show that development using the ADDIE model produces quality products and learning. In designing learning media using.

2. Research Methods

The development model used in the design of this learning media is ADDIE. This model is one of the systematic learning design models. The level of learning material design and development, systematic as a procedural aspect of the systems approach has been manifested in many methodological practices for the design of text development, audiovisual materials and computer-based learning materials. As stated by Adnyana [7][12] that interactive multimedia developed with the ADDIE model has proven useful and can improve student learning outcomes. The ADDIE model consists of 5 (five) steps, namely: (1) analysis, (2) design, (3) development, (4) implementation and (5) evaluation[13].

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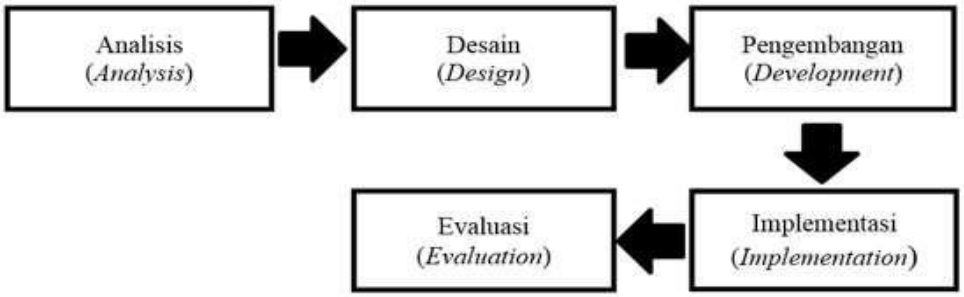

Figure 1. ADDIE Flowchart

3. Result and Discussion

3.1 Analyze

At the initial stage, a descriptive analysis was carried out, namely an analysis of the characteristics of science subjects. This activity is carried out to find out the needs of science subjects which are used as objects of development. Natural science subjects are a science which contains scientific theories of knowledge about nature and is closely related to human life [8]. Although natural science subjects are theoretical subjects, in the teaching and learning process teachers are required to be able to provide real examples to students. In delivering science subject matter, teachers are still very conventional, namely the lecture method or direct exposure that seems less attractive. This causes students to become less understanding and tend to be bored with the material so that it requires innovation in the delivery of the material[15].

3.2 Design

At this stage, there are 2 stages, namely the design and the character design process. At this design stage, the author discusses the steps in making learning media. Introduction to the properties of interactive multimedia-based objects, starting from preparing equipment for interactive multimedia creation, designing the display to the animation and scripting process in Adobe Flash CS3. The equipment in the design of making this interactive multimedia, the equipment prepared is a laptop, CorelDraw X7 software to create character designs in this interactive multimedia and Adobe Flash CS3 for making animations and filling out scripts. At the character design stage, using CorelDraw X7 software. In the CorelDraw X7 software used by the author in designing learning media for the introduction of the properties of these objects, there are many tools that can be used to design a character. To design the character, the author uses the pen tool which is one of the tools that can be used to create curved objects. The next process is making the background. To create a background, the first thing to do is determine the size, here the author uses a size of 1024px x 768px according to the size of the computer monitor screen. After that, coloring is done on the background and the arrangement of the elements in it such as objects, text, and so on so that it becomes a unified whole. In making learning media to recognize the properties of objects based on interactive multimedia, navigation buttons are needed which will later be used to connect one page to another.

3.3 Development

At this stage of development, interactive multimedia is made from learning media for the introduction of the properties of objects. In designing learning media for the introduction of the properties of objects, the author uses Adobe Flash CS3 Professional software. To make it look more attractive, some objects will be animated. Animation will use the Motion Tween technique, the use of motion tween is felt to make animation easier than using the frame by frame technique, but under certain conditions the frame by frame technique is more needed, especially for animations that require fine details such as animation of people walking or animation of broken glass. 9]. To make this learning media more interactive, buttons are needed that will be used to interact with other pages on this learning media. Furthermore, coding or Action Script serves to give commands to interactive multimedia so that it can run and function as desired, and the last stage is to enter backsound. Sound is one of the most important assets in interactive multimedia. In addition to using the

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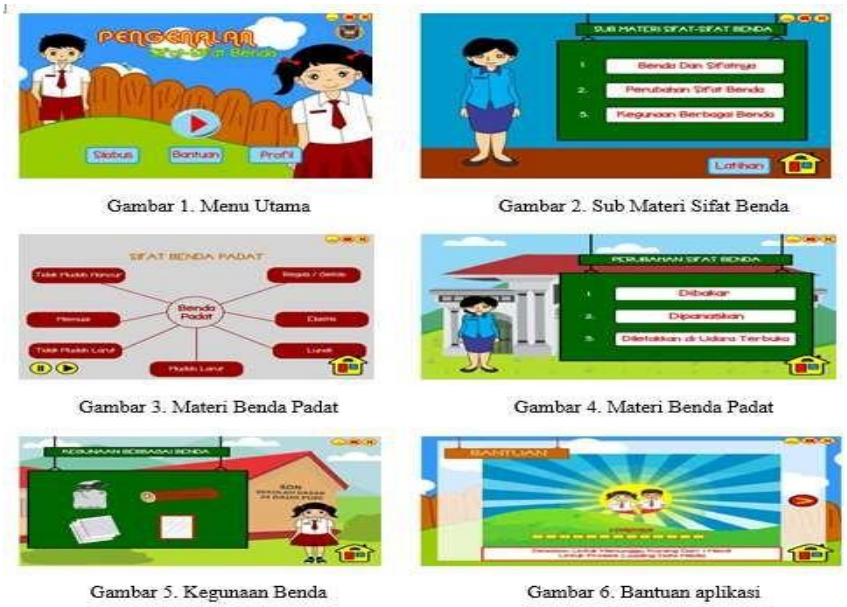
dubbing technique (narrative sound), the author also includes backsound and sound effects that function to make interactive multimedia or animation more lively and interesting.

3.4 Implementation

The implementation stage is testing the learning media to students. In testing this learning media, the author conducted a test using a questionnaire or questionnaire regarding student responses to this learning media. The number of respondents needed for the sample is 79 students with an age range of 9-10 years who will be taken from class A and class B by asking questions consisting of 7 questions regarding the visual appearance of the designed application, students' understanding of the material and comfort. students in using this application. Based on the slovin formula used by the author in determining the number of samples, it produces 79 students who will be used as respondents or samples in this learning media test. Testing of learning media is done by displaying the results of learning media that have been finished to grade 3 students using an LCD projector in front of the class, after this the students who are respondents are asked to fill out an application testing questionnaire with 10 questions related to the display of the designed learning media, students' ability to use learning media and students' understanding of the material presented. Based on the results of the questionnaire, the authors get the results that 90.63% of students like learning media for the introduction of the properties of these objects, 91.64% of students like pictures on learning media to recognize the properties of these objects, 91.13% of students like colors in media. learning the introduction of the properties of these objects, 82.53% of students said they could use learning media to recognize the properties of these objects, 96% of students already knew the nature of air, 100% of students already knew what objects were soluble in water, 97% of students already know how the shape changes due to the combustion process, 100% of students already know what materials are not easily broken, 100% of students already know the nature of wood, and 87% of students already know the raw materials for making paper. The following is an interactive display of multimedia learning to recognize the properties of objects.



Gambar 1. Menu Utama | Gambar 2. Sub Materi Sifat Benda

Gambar 3. Materi Benda Padat | Gambar 4. Materi Benda Padat

Gambar 5. Kegunaan Benda | Gambar 6. Bantuan aplikasi

Figure 2. Interactive Multimedia Applications

3.5 Evaluation

It can be concluded from the results of the questionnaire that the learning media for the introduction of the properties of these objects has an attractive visual appearance, both in terms of character depiction, coloring, and animation. Learning media for recognizing the properties of objects is also easy for students to use. In addition, the learning media for the introduction of the properties of these objects has been able to explain each material well and can be understood by students.

4. Conclusion

The conclusions that can be drawn from this research are as follows From the results of the system test questionnaire to the teacher, it can be seen that the learning media for the introduction of the properties of objects is very helpful for teachers at SDN 24 Dauh Puri in conveying material on the properties of objects without having to do practicum and can be an alternative for students in studying science subjects. so that students are more interested and enthusiastic in learning.

From the results of the system testing questionnaire to students, it can be concluded that 90.63% of students like this learning media, 91.64% of students like the picture on this learning media, 91.13% of students like the color in this learning media, 82.53% students stated that they could use this learning media, 96% of students knew the nature of air, 100% of students knew what objects were dissolved in water, 97% of students knew how to change shape due to the combustion process, 100% of students knew what materials were not easily broken, 100% of students know the nature of wood, and 87% of students know the raw material for making paper. From the test results, it can be concluded that the learning media for the introduction of the properties of these objects has an attractive visual appearance, both in terms of character depiction, coloring, and animation. Learning media for recognizing the properties of objects is also easy for students to use. In addition, the learning media for the introduction of the properties of these objects has been able to explain each material well and can be understood by students.

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