



## **APPLICATION OF AUGMENTED REALITY AS A LEARNING MEDIA OF MOLLUSCA GROUP ANIMAL RECOGNITION AND ITS HABITAT BASED ON ANDROID**

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### **Abstract**

Augmented Reality is a technology that is currently developing, this technology can combine the virtual world with the real world. Augmented Reality technology has been developed in many fields. One application of Augmented Reality technology is in the field of education, as a learning medium. Currently, there are still many learning media that use books and blackboards as a means of delivering material so that students feel bored to learn because the material obtained is only in the form of text and two-dimensional images. Submission of material like this is considered less informative and interactive for students so that it has an impact on decreasing student interest in learning. This Mollusca animal application was created to provide an alternative to easy teaching for biology teachers at SMA N 1 Penawar Aji in providing Mollusca animal material to students of class X majoring in Science, by describing an object in three-dimensional form. With this, students will also understand and be more interested in studying Molluscs. And can make it easier for students to learn how the shape of Mollusca animals and their habitats. This application is made using Unity 3D software. The system development method used in making this application uses the MDLC (Multimedia Development Life Cycle) method. The way this application works is that the camera on the android device functions as an input device that will capture the marker, after the marker is detected the three-dimensional object that has been created will be displayed on the screen. The results of the development of this application can provide convenience for teachers in conveying material about Mollusca animals and students can clearly see the shape of Mollusca animals and their habitats

**Keyword:** Augmented Reality, Mollusc Animal, Learning Media, Technology.

## **1. INTRODUCING**

The development of the world of technology is increasingly advanced, has increased and is almost evenly distributed throughout the world fields, especially technological developments in the field of education [1], [2]. Education is very necessary as intermediary messengers, in order to minimize failures during the learning process. At level There are several types of subjects taught in SMA majoring in science, one of which is biology. Biology is a branch of science that studies living things and their environment. A living thing is an organism that can defend itself from various forms environmental changes and can breed to preserve the species [3]. Along with the progress of science sciences and technology, biologists then found a way to classify creatures Life is based on certain characteristics it has which is then known as classification. Classification of living things is a process of grouping living things based on similarities owned traits[4]. In essence, the classification of living things is a method used to grouping living things into certain groups or units called taxon. The purpose of classification living things is to make it easier to know, adapt, and study living things. In the classification system of living things there are many types, one of which is kingdom animal. In the animal kingdom, it is divided into two types based on the presence or absence of a spine, namely: vertebrates (invertebrates) and vertebrates (vertebrates). In invertebrates There are several types of classification, one of which is the Mollusca group of animals. Molluscas in general live in the sea although there are also those who live on land [5]. The body is soft, slimy, and coat,



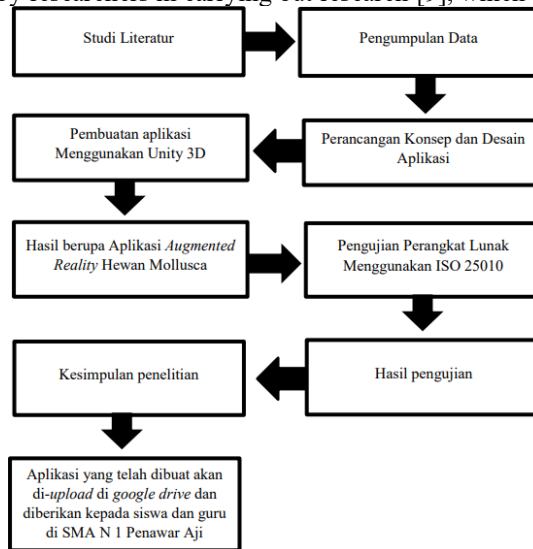
usually protected by a lime shell. Molluscas are the material taught in class X majoring in science at SMA N 1 Penawar Aji. In this lesson, we discuss the body parts of Mollusca animals that are divided into several classes, namely Amphineura, Gastropods, Cephalopoda, Scaphopoda, and Pelecypoda .

At this time the learning methods used in the delivery of Mollusca Animal material are: using books and blackboards. This of course makes students bored in following learning. And the delivery of material like this is considered less informative and interactive for students so that have an impact on decreasing student interest in learning. However, various technologies can be used as a learning support by displaying 3-dimensional visuals of Mollusca animal objects Examples The application of that technology is Augmented Reality [6]. Augmented Reality has been widely developed in learning media. Use of technology Augmented reality in the form of learning media in the delivery of material is expected to provide positive benefits to students [7]. Utilization of Augmented Reality technology is able to make learning activities become more interactive [8]. Based on the problems above, the researcher aims to develop an application that is expected to support SMA N 1 Penawar Aji students to get to know Mollusca Animals and their The habitat. The researchers designed an application of augmented reality as a media" learning introduction to mollusca group animals and their habitat based on android as one of the alternative methods to increase student interest in receiving subject matter.

## 2. RESEARCH METHODS

### 2.1 Research Stages

The research stage is a step taken by researchers in carrying out research [9], which can seen in the following image.



**Figure 1.** Research Stage

### 2.2 Data Collection Technique

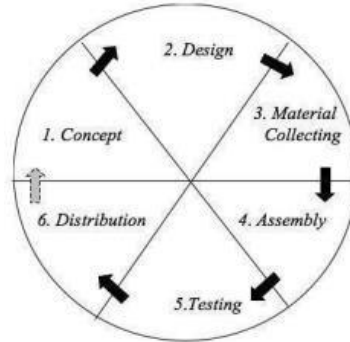
Data collection techniques in this study using interviews, literature study, and observation.

- The interview was conducted by interviewing the biology teacher of class X SMA N 1 Penawar Aji with asked 8 questions related to the research.
- Literature study is carried out by collecting data through related reading sources with the data needed, so that the author can analyze the data to be compiled in support of study.
- Observation is a written observation process directly from human activities or research objects, where the activity is to produce facts [10].



## 2.2 System Development Method

The system development method used in this research is the Multimedia Development Life Cycle (MDLC) [11].



**Figure 2.** Multimedia Development Life Cycle (MDLC)

There are several stages carried out in the Multimedia Development Life Cycle (MDLC) method as follows:

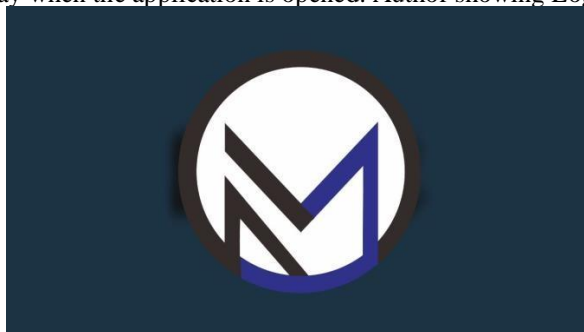
- a. Concept is the stage to determine the purpose of the user (audience identification), application (presentation, interactive, etc.), application objectives, and general specifications.
- b. Design is the stage of creating an overview of the application in the form of ideas, themes and the appearance that will be displayed made.
- c. Collecting Materials is the stage where researchers collect the materials needed in the manufacture of materials application.
- d. Assembly is the stage where all the objects or materials to make the application are created and combined thus generating an application.
- e. Testing is the stage carried out after the assembly process with the aim of finding out whether the application can run properly and properly, also to find errors or errors in the application run the application.
- f. Distribution is the stage that is carried out after the testing process and published so that users can use it [12].

## 3. RESULT AND DISCUSSIONS

In accordance with the storyboard design that has been made, the results and discussion of the implementation interface design is as follows:

### 1. Splashscreen

Splashscreen is the first display when the application is opened. Author showing Logo application.

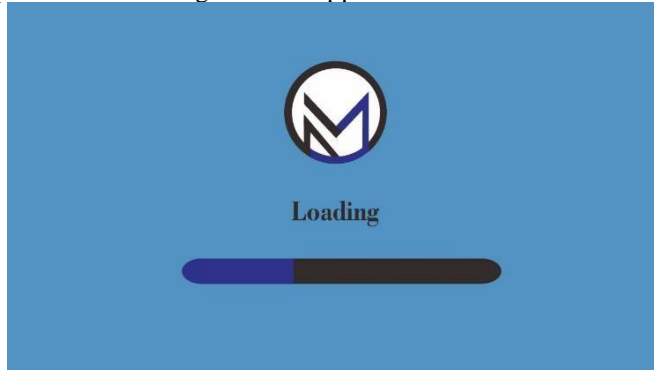


**Figure 3.** Splashscreen



**2. Menu Loading**

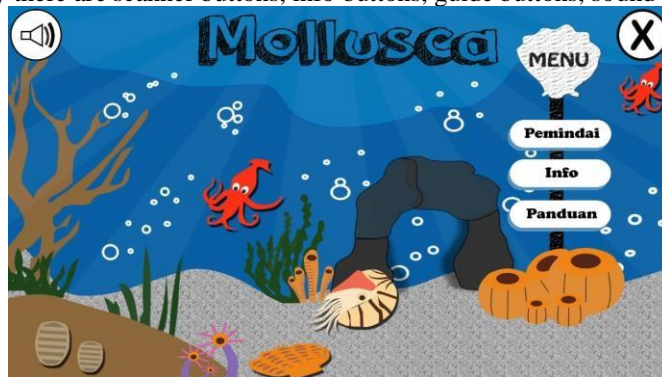
The loading menu will appear before entering the main application menu.



**Figure 4.** Menu Loading

**3. Main Menu**

On the main menu display there are scanner buttons, info buttons, guide buttons, sound buttons and exit button.



**Figure 5.** Main Menu

**4. Scanner Menu**

The scanner menu will appear when click the scanner button on the main menu. In the scanner menu is given 10 choices of Mollusca animals to be scanned. If you have chosen one of the animal names, then adjust the name animal on the button with the name of the animal on the marker.



**Figure 5.** Scanner Menu

When you enter the camera and the marker is detected, a 3D object will appear. The rotation button works for provide movement to 3D objects. In addition, there are zoom in and zoom out buttons to zoom in or zoom out 3D objects. There is an info button to explain information about animals Scanned Mollusca. Then there is a back button to return to the scanner menu and a home button to return to the main menu.

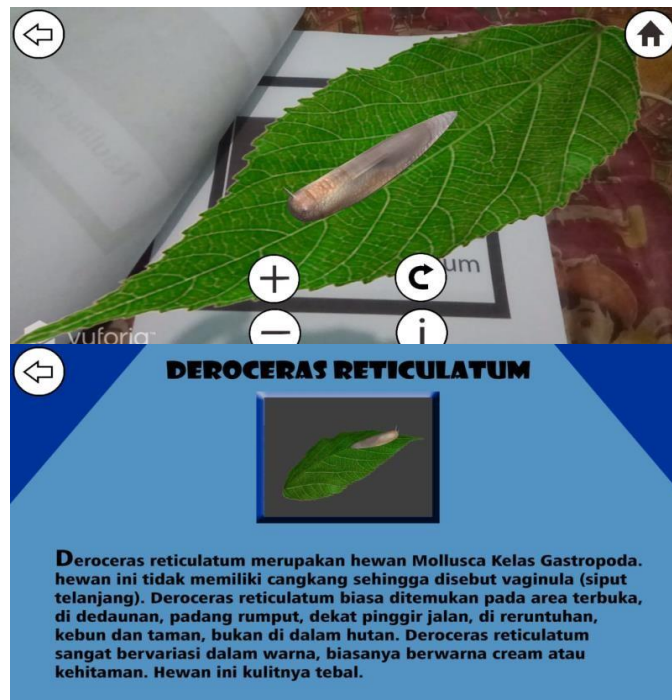


Figure 6. Result Scanner

5. **Menu Info**

This menu will appear when the user presses the "Info" button on the main menu. On this info page contains information about the author in the form of Name, NPM, University, Application Name, and Case Study. As for back button which serves to return to the main menu.



Figure 7. Menu Info

6. **Guide Menu**

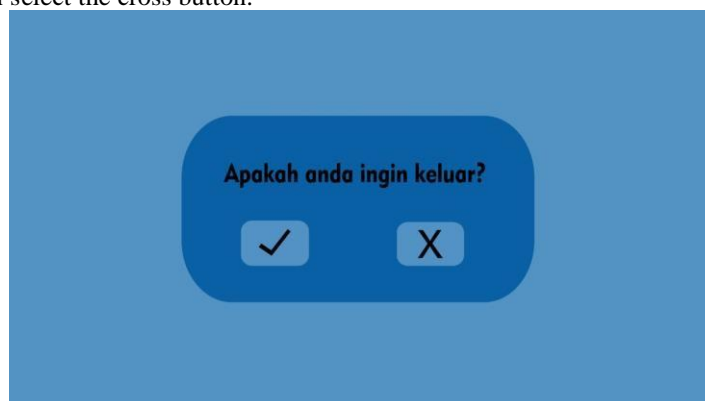
The guide menu will appear when the user presses the Guide button on the main menu. On the guide menu There is a way to use the application navigation buttons. The back button works to return to the main menu while next button to go to the next manual page.



**Figure 8.** Guide Menu

**7. Exit Menu**

The exit menu serves to exit the M.AR application, when selecting the exit button in the main menu then the option will appear whether you want to exit? if you want to exit select the check button, but if you want remains in the M.AR application then select the cross button.



**Figure 9.** Exit Menu

**3.1 Testing**

Tests are carried out to check whether there are errors in the application that has been made, analyze whether there are functions that are not running properly, and analyze whether the components contained in the system run as expected. Tests are carried out using ISO 25010 with two aspects of testing, namely functional (functionality) and user-friendliness (usability) [13].

Based on the results of functional suitability testing that has been carried out with expert lecturers, field of expertise in software engineering the field of computer science expertise, the percentage results are as follows:



Percentage of functional suitability :  $36/36 \times 100\% = 100\%$

Percentage of usability :  $2043/2160 \times 100\% = 95\%$ .

From the results of calculations on usability testing, the percentage is 95% and is classified as very good. Therefore, the M.AR Application has met the usability aspect.

#### 4. CONCLUSION

Based on the results of the discussion, it can be concluded that the research conducted resulted in a Mollusca animal application or named M.AR using augmented reality technology with Media Development Life Cycle (MDLC) method. The development of this application begins with making a design design the application interface and create a navigation structure, then create a three-dimensional design using 3D Studio Max software. Asset creation in Photoshop CS3 and Corel Draw 2018 and process application creation in Unity 3D. Stages of testing using ISO 25010 testing with two characteristics namely functional suitability and usability

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