Learning Media Design Based on Augmented Reality Introduction to Rare Plants

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Abstract—This research is motivated by the lack of technology-based learning media, namely Augmented Reality, the use of Augmented Reality can be used as an interactive and interesting learning media solution. By utilizing Augmented Reality technology, the introduction of rare plants that were originally presented in the form of images can be added with 3-dimensional information that is displayed virtually which will later use a smartphone device, so that the learning process is more interesting. The purpose of this research is to design learning media based on Augmented Reality in recognizing rare plants, this is because Augmented Reality is an application that can use a database in the form of 3-dimensional animation that affects students in learning activities. The media contained in Augmented Reality is a combination of real illustrations in the technological process.

Keywords— Learning Media, Augmented Reality, Rare Plants

I. INTRODUCTION

Learning media has something important in learning activities. Users of learning media can help educators in delivering learning material to students because learning media is an important component in determining the success of delivering material to students.[1]

A good learning process is expected to be able to produce a more effective and efficient delivery of teaching materials. For that we need tools to create a good and fun learning process, Learning aids are a tool when the learning process. A fun Learning Activities is usually observed in the student learning activities which can be seen in the classroom, good learning activities can change a good learning atmosphere as the students can learn on their own according to their own experiences.[2],

Advances in information and communication technology today have changed many fields, including education. One form of reality is the use of virtual smartphones to support learning in schools.[3],

In teaching and learning activities, educators discuss lessons using symbols using paintings, pictures, or posters, and books. These senses consume a lot of paper and ink result in wastage. On that basis, It is necessary to develop facilities that students can use to learn with technology. The technology in particular is Augmented Reality (AR). additional reality, which makes virtual materials available to students. In the learning process students understand the lesson not only through books, posters or pictures hung on the classroom walls, but also through augmented reality-based learning media that helps students to use them easily.. Moreover, AR-assisted learning is engaging and engaging for high school and college students. Augmented reality technology is used to share books. Magic Book is an Android-based application that uses markers for three-dimensional objects, namely augmented reality.[4]

Learning materials based on augmented reality make learning activities motivated, interesting and increase the perception of the effectiveness of learning. In addition, learning materials based on augmented reality can increase the level of ethical efficiency and self-efficacy of students.[5].

Augmented reality has an impact on modern learning activities in education. The ability of augmented reality technology will make the learning atmosphere more interactive and broad. The previous education system used textbooks and recently educators are starting to encourage the use of smart classrooms that bring video to life. This is where the technology heading into the future is called augmented reality. Students will have a real vision of the shape of the real world, interact by touching it, which makes them add better insight into the concept of learning.[6].

The augmented reality interface allows us to view the real world simultaneously with virtual images connected to real places and objects. In an augmented reality interface, we can see the world through a mobile screen (smartphone) or a head-mounted display (HMD), which is a transparent graphic or overlay on a video of the surrounding environment. The augmented reality interface enhances the real experience, unlike computer interfaces which keep us away from the real world and move to the monitor screen. One user interface was developed for augmented reality for computer-assisted instruction, manufacturing, and medical visualization. This app shows that an augmented reality interface can make it possible to relate to the real world in ways that were not possible before.[7]

Rare plants are a condition of an almost extinct plant population, even very few in number. Some of the rare plants are rafflesia, corpse flower, this rare plant can no longer be found in the wild and one of the causes of its rarity is habitat destruction so that it is unable to restore its population.

Knowledge of rare plants is still used as learning material in schools, especially at the elementary level. One of the thoughts about the importance of knowledge about rare plants for children is as learning in order to keep the environment sustainable. In addition, knowing the existence of rare plants so that it needs to be maintained and preserved so that they do not become extinct.[8]

So the goal according to this study is to create a learning media based on technology for the dissemination of rare flora using Augmented reality, the results will make students not bored because it is made as attractive as possible using a concrete dream display that students like and makes learning easier.[9]

II. RELATED WORK

This section discusses the latest literature regarding the use of Augmented Reality in making learning media:

Augmented Reality in making Geometry Learning Media for Junior High School Students so that understanding geometry, especially three-dimensional space using this media can overcome student difficulties in understanding the concept of geometry.[10]

This study proves that making learning media using Augmented Reality on the Android operating system has the ability to be used in chemistry learning, especially in molecular geometry subjects.[11]

This study uses the process of designing instructional media using augmented reality technology with the topic of learning taken is the introduction of fish species.[12]

The results of this study are to explain the display of the results of each stage of making learning media based on augmented reality on conformational images of alkanes and cycloalkanes, the results of testing learning media based on augmented reality on the conformational concepts of alkanes and cycloalkanes can be analyzed.[13]

Research on augmented reality technology uses android with educational books that discuss the metamorphosis process to create an interactive, interesting, and clearer delivery of content.[14]

III. RESULT

In designing a system it is necessary to know what will support the system, so that it can facilitate its use later. This application is expected to be useful for users which later can be used as additional media in the teaching and learning process.

1. Splash Screen Display Design

The splash screen is the home page that first appears. This page appears when the application is run to indicate the application starts working, for more details, see Fig.1;
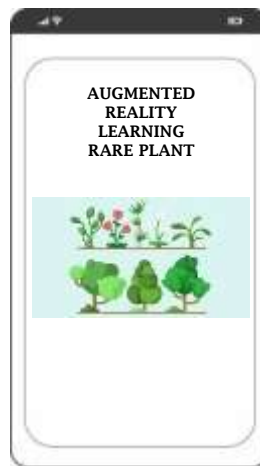

Fig. 1. Front view design

2. Home Menu Display Design

Once done, show the splash screen. Jump to the primary dish. In the primary menu there are still 3 buttons, namely the AR Scan Button, About Button, and Exit Button for more details,, see Fig. 2;
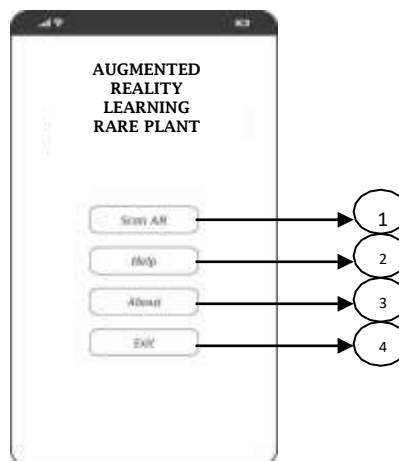

Fig.2. Home menu display design

Caption of Fig. 2:

1. AR Scan button, functions to scan images.
2. Button Help, functions to open the help page/tutorial menu for using the application.
3. About button, functions to display the menu page about the author.
4. Exit button, functions to exit the application.

3. Scan AR Menu Display Design

This view opens after pressing the AR scan button, the smartphone camera will be active. Furthermore, the application will detect an image, for more details, it can be seen in Fig. 3:
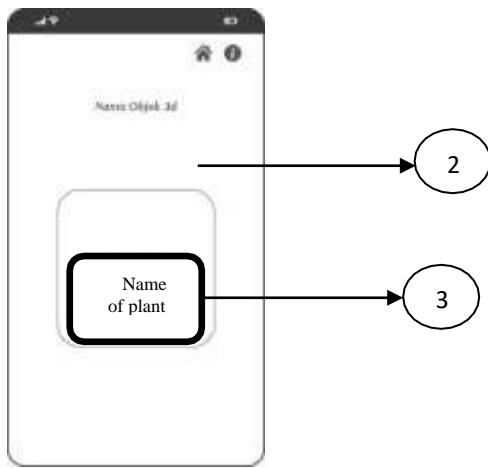
Fig. 3. Display AR scan menu

Description of Fig. 3:

1. Image Button 1, functions as a return page to the home menu
2. Camera Android, serves to display the camera that will read the image.
3. Image Button 2, functions to display plant information on objects.

4. Object Information Display Design

This display opens after the AR scan page can detect images, for more details, see Fig. 4:
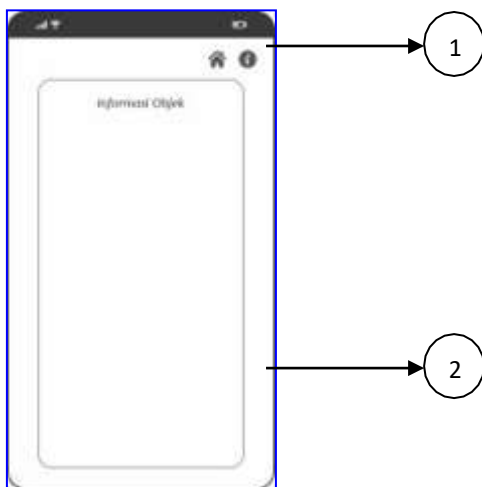

Fig.4. Design of plant information display on objects

Description of Fig .4:

1. Image Button 1, functions as a return page to the home menu.
2. Image View, functions to display objects along with a description of the name of the plant.

5. Display Help Menu Design

This page is a help or tutorial that is made to inform how to use the AR application, for more details, see Fig. 5:
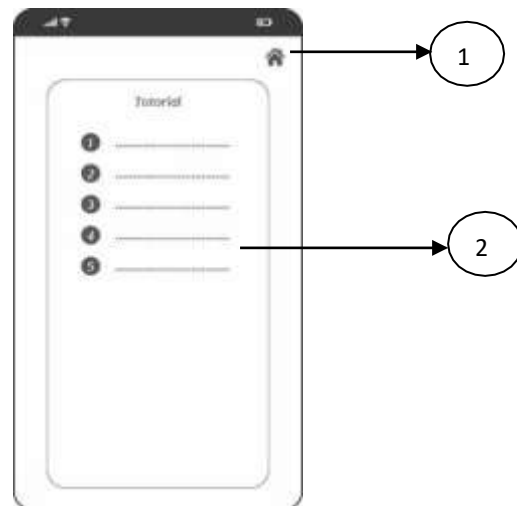

Fig. 5. Tutorial display design (help)

Description of Fig. 5:

1. Image Button 1, functions as a return page to the home menu.
2. Text View, which functions to display a guide page/tutorial for using the application.

6. Menu Display Design About

This page contains the identity of the author, for more details, see Fig. 6;
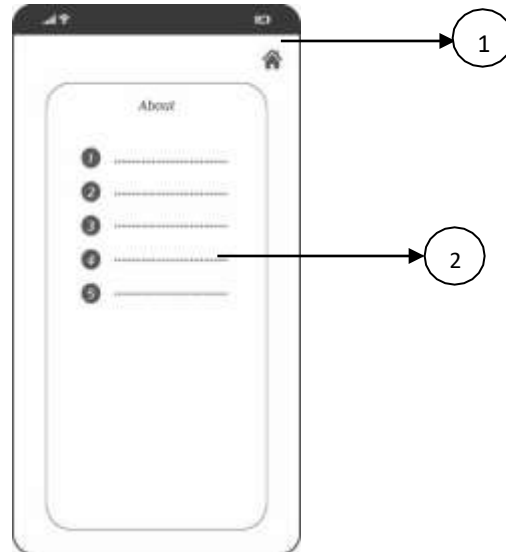

Fig. 6. Display design about

Description of Fig. 6:

1. Image Button 1, functions as a return page to the home menu.
2. Text View, serves to display a page about the author.

IV. CONCLUSIONS

From the results of the research that researchers have done, several conclusions can be drawn, namely:

1. With the Augmented Reality application, this application can be applied as a learning medium for students.

2. With the Augmented Reality application, this application can be useful for users who want to learn and understand more about rare plants.

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