

MOBILE AUGMENTED REALITY APPLICATION THROUGH METAVERSE APPROACH AS SOCIAL STUDIES LEARNING MEDIA IN JUNIOR HIGH SCHOOL

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Abstract

This study aims to create augmented reality-based social studies learning media to hone teaching skills. Augmented reality (AR) media development through the metaverse approach is one of the learning media innovative blending education with technology. With this cooperation, students and teachers can balance time with them. The Metaverse project is relevant in changing times everything to be digital, must be optimized by every human. Thus, the presence of this metaverse could be utilized in the right, especially for students, students for making learning more interesting. Social Studies at school medium first with the use of AR app. Indeed, it will help teachers in conveying theory to students. Indeed, the use of AR media through the Metaverse method will help students in understanding the Social Studies concept. The approach considered research appropriate in the study combined quantitative and qualitative, as well as design-based research. Results that can be obtained from the study this is the enthusiasm of students for AR-based social studies learning.

Keywords: Augmented reality, Learning, Social studies.

1. Introduction

Social studies education has a special room in the scope of discipline and knowledge in social aspects, such as history, sociology, geography, economics, and anthropology. There is a need for material that can be visualized or depicted in the world. However, this has limitations because it needs learning resources, and media could not be presented by direct-to-room classes such as statues, statues relics, temples, and relics. That results in hindrance for teachers and students in walk learning because there is no existence real visual that can describe the product relic era. The problem in the current era could be answered using Augmented Reality (AR) media that can visualize form desired object. Development technology is so fast and digital multimedia of course allow happening delivery of interactive and interesting information [1]. Indeed, the presence of AR is an innovation for teachers and students with presence of AR. The existence of a media helper for educators can explain with good 3D objects. Thus, students can describe visual learning that is explained by the teacher or educator. Indeed, the existence merging between AR and learning can grow an interactive and comprehensive learning media. Thus, students have a more active output of reading and learning to be more active with something new in the learning method.

AR is a technology that combines objects from the real world and virtual or virtual objects in real conditions. Merging real with virtual objects occurs with the support of the right technology while the interaction can occur using certain devices. AR is a variation of Virtual Environments (VE), better known as Virtual Reality (VR). VR technology makes users join in a virtual environment. AR technology is developing very quickly. In Indonesia, many applications use AR. The presence of AR is a breakthrough in the field of very sophisticated technology. With this technology, we can make everything abstract or virtual look real. In its development, AR is used as a learning medium to explain information. Thus, it can be accepted and provide interaction in the learning process.

AR is defined as a technology that can bring visual information to reality and has the principle of combining virtual information with bringing it to the world real after simulation like text, pictures, model 3D, music, and videos [2]. AR alone has three technologies that are technology appearance intelligence, registration 3D, and technology interaction intelligence [3]. For tool development of AR, there is SDK AR Foreign (a platform launched by apple) and ARCore (a platform device soft Google for building application AR, which is like ARKit apple) with the function is capture movement, environmental perception, and light source perception. Apart from that, SDK AR foreign is Vuforia's moment, in which this is SDK's most popular. Function introduction mainly supports iOS, Android and UWP, and SDKs. SDK Domestic AR is not easy to meet the development needs of the country. Currently, the domestic AR and SDK mainly include Baidu AR, NetEase Insight AR, Vision+EasyAR, Liangfengtai HiAR, Tianyan AR, Taixu AR, and Magic AR.

Technology will help in conveying information to users. But, the opposite of VR which combines object real (users) into the environment virtual, AR combines object virtual environment real [4]. The advantage of AR itself is its rapid development more economical and easier, another advantage is that AR can be widely applied in various media. It is very possible to make an application on smartphones or in the form of print media such as newspapers, books, and

magazines. That is why AR has been used in many applications [5, 6]. The application of AR in education can be in the form of product study that is media learning book story pictorial-based AR declared worthy and practical for used para student generation Z on process learning mathematics or on development teacher competition. This is based on the results of the feasibility assessment of media experts, experts in language, and experts in theory. Besides field education, AR could affect entertainment (including video games) as well as tourism, architecture, medicine, and industry [2].

2. Literature Review

2.1. Social studies learning

Social studies learning is a scientific field or academic discipline, in addition, Social Science is a science that studies the phenomena about social phenomena and social problems. Social studies learning process at various levels of basic education to tertiary education does not emphasize the theoretical aspects of scientific, but rather emphasizes the practical aspect of studying, studying, and studying symptoms and problem social, with consider the weight and level of ability participants educate on each different level.

The form of learning is also in the form of concepts and facts according to the Social Studies important for understanding and solving related problems social. For example, in geography about environmental destruction, finally, there are symptoms of natural damage which not only damage geography mere, but by the economy, social society, politics, law, and others are not balanced or closely related. Here social studies have a destination which mainly, that students same very no made experts knowledge of social (history, economics, sociology, geography), but shape the attitude of life as expected for current and future development processes following development goals national and country.

2.2. Learning media

One of the factors that influence the progress of the nation is the quality of human resources in mastering knowledge and technology in the era of the industrial revolution 4.0 [7]. The quality of education in Indonesia is increasingly demanding to improve to keep up with the development era which develops very fast. Education is good and needs support from auxiliary elements. Thus, the learning process in the classroom can run well, from the is media learning component learning which very important as a bridge in the delivery of material. Learning media is one of the factors that play an important role during process learning because media learning is a form of transformation or intermediary knowledge from teacher to student. This held means could something be delivered in process of learning. Thus, teachers could more easily convey knowledge using learning media and vice versa. a student could stimulate and help students in understand process learning in the classroom. The presence of media learning has a function that could arouse students' motivation in learning, in the media the learner also has a function stimulus study and trigger student could sick learning. Process learning implemented by students is expected to develop student learning achievement. This is because achievement is related to the achievement of aspects that are cognitive, affective, and psychomotor.

2.3. Technology

The technology that exists in the 4.0 era has developed very rapidly. Existence The development of technology goes hand in hand with the development of science and serves as an aid in learning activities. Using technology, humans can get everything quickly, for example in the field of education such as looking for teaching materials for the learning process that will hold. Technology is also not something new enjoyed by man in daily life, but already there is since year 80s. In century 21 which is called digital era. The use of technology already becomes a need for students underage to adults [8].

Digital technology is a necessity in today's education system. because already been adopted by the ministry of education and culture republic Indonesia (Kemendikbud) to develop a new curriculum and online system and develop education towards creative Indonesia in 2045. Adaptation conducted to reach suitability draft with capacity participant educate and competence of educators and education personnel. Education in Indonesia is moderate facing big problems with the challenges of globalization which are increasingly large in all aspects of life, including education. Reconstruction is needed in the world of education to prepare candidate inhabitants globally. Inhabitant global forms development score - score base humanity in development rights and the state's obligation to carry out its duties [9]. Therefore, technological progress is inseparable and necessary to advance the system of education, especially in Indonesia.

Educational technology itself is a study and practice ethics about facilitating learning and improving performance by creating, using, and managing processes and source studies which appropriate [10]. Wrong one component of learning which very important. Thus, destination learning could be achieved is with the existence of media. The media is an inseparable part of the learning process to teach to achieve educational goals [2]. In addition, learning is also always required to follow developments in Knowledge and Technology (science and technology). Thus, it is capable of presenting an atmosphere class following the needs era and following character students. The development of Knowledge and Technology brings implications for each generation in various fields of knowledge, Thus, generation will be educated following the development of science and technology [11]. Education technology alone has a role in developing media learning which is used by teachers in the process of learning to use give enhancement to students' learning motivation. For example, there is a learning video or PowerPoint interactive with an attractive appearance that sparks enthusiasm for learning participant education. Thereby, process learning which is conducted with the utilization of technology walks pleasant and reaps results that maximum.

2.4. Metaverse

Etymologically, metaverse comes from the word "meta" which means beyond, and "verse" means the universe. Metaverse is described as a technology that allows people to gather and communicate by entering a virtual world. In the metaverse or virtual world, each person will not flash individually. They will have connections with other people, even autonomous NPCs, and holograms. Metaverse is a digital reality that connects aspects of social media, online gaming, AR, VR, and cryptocurrency to allow users to interact virtually. Metaverse has advantages in the

social realm because with the metaverse social interaction becomes unlimited, and things that are difficult to reach see can now be visualized [12].

Metaverse can now be used in various fields including education. In the realm of education, the metaverse is used as a medium of learning, learning methods, learning resources, and other technological developments. In practice, teacher competence begins to carry out the concept of metaverse [3, 13, 14].

3. Research Methods

The method used the idea of *Discendo discimus* (DISMUS APP) in a combining approach. We used quantitative and qualitative research (known as the mixed methods approach) and Design-based research. The study started with to do AR media creation in eye social studies lesson examples made found in the material learning history in class VIII semester 2. This study made AR media with the use AR app, creating an AR catalogue arrived to make the design [15].

4. Results and Discussion

Based on the problems that have been described previously, it is necessary for media Learning digitally with a feature of AR which is the concept of merging the virtual world into the real world. The creation virtual world is done to evoke the user's perception to understanding information from recognized objects [9]. AR features used intended to support the learning process of Social studies which aims to help students in understanding social studies learning that has to discipline diverse knowledge. AR innovation is designed in the form of an application called *DISMUS* Loaded applications from the Latin that is *Discendo discimus* which means *Moment teach, we also learn*. *DISMUS APP* is an application for media learning digital based which inside it is containing introduction material type rubbish shaped effect AR. Thus, students could understand interesting learning with the target of middle school age students first from ages 13-16 years.

Media selection AR this too based on the results of previous research conducted on the students of KBIT Wildani 2 Surabaya, researchers conducted learning the introduction of animal species using AR [16]. Test results from the research are very good, where 93% of students get recognize objects and animals from the environment in their life, as big as 100 % state students could repeat the spelling of the names of animals in Indonesian, 95% of students could repeat the spelling of the name of the animal in English, as big as 95% of students could mention characteristic features animal with choosing wrong one part the body of the selected animal, and by 100% said the students was more interested using AR instead of using Educational Teaching Aids (APE) as media learning. Based on the results, the use of AR as a learning medium for school-age students is very influential against the level of student achievement through creative learning methods and innovation.

The AR features implemented in this application are realized through a catalogue card which helps teachers and parents provide interesting learning about the importance education environment to the students [7, 15]. AR here works by showing object virtual in the form of type rubbish along with for example. It is hoped that this media can facilitate the learning process and capable increase the understanding of the students for always being aware will knowledge. Thus, the students can capable apply it to the everyday world, thus making the students ready

for could socialize and develop shapes lessons learned. In the DISMUS APP, in addition to providing AR features, there are also several features feature like:

- (i) The existence of 3D objects in the form of images for students can know an example of social studies learning.
- (ii) Videos with animation make students can better understand the material that has served.
- (iii) Games or games that hone students' understanding after seeing Theory and videos animation which has served, the game here displayed in an interesting and fun way. Thus, students do not get bored learning about the environment using DISMUS APP.

4.1. Research stage

In cataloging for 3D markers in the DISMUS APP application many steps are as follows (see Fig. 1):

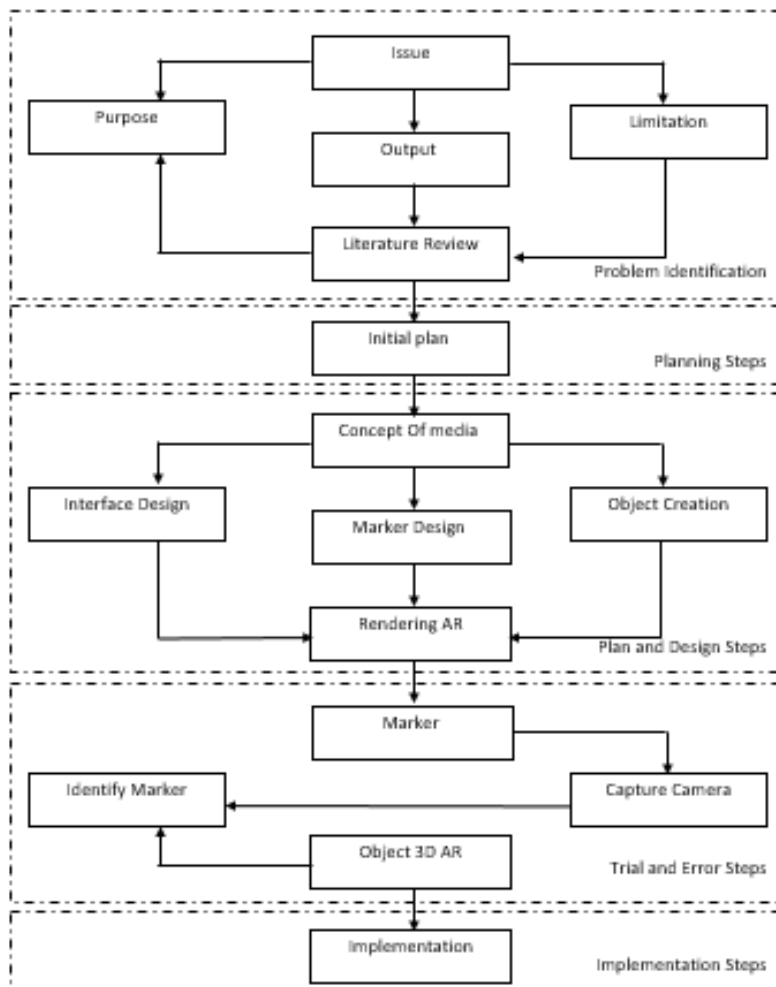



Fig. 1. Research stage.

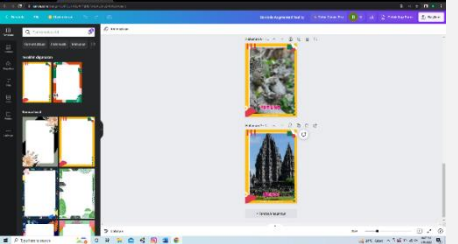
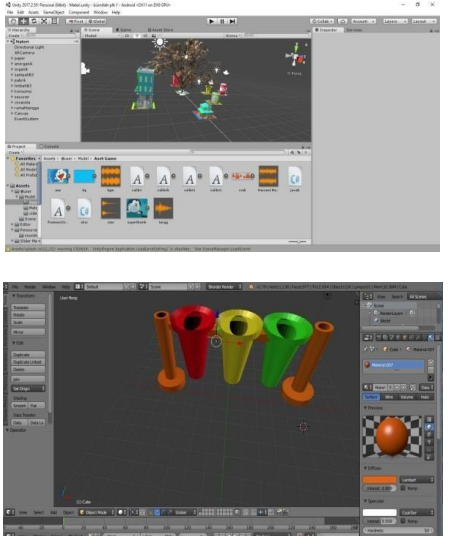

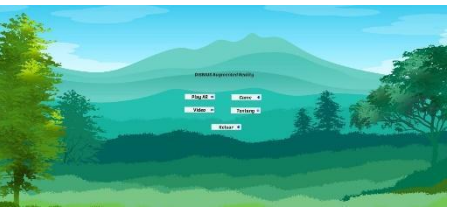
- (i) Envisioning Phase (Problem Identification). That is the stage to analyse the needs utilization catalogue which is customized with the needs Theory about learning knowledge and knowledge social. Problem identification technique using interview technique to teach social studies teachers in Bandung and lecturer experts in the material knowledge social. The purpose of this stage is to take advantage of the new technology in the field of Education, specifically, applications utilizing technology AR on card catalogues for students more easily use AR learning media.
- (ii) Planning Phase (Planning). Stages where catalogue which will be made modelled, designed, and planned following the objectives and benefits want to achieved in form drafts.
- (iii) developing Phase (design/design). Stages were drafted the realized in the form of product catalogue cards. At this stage will be made are a catalogue containing markers from introduction-type rubbish.
- (iv) Deploying Phase (Implementation). Stages in which catalogue products are used by the target. Thus, design planning DISMUS APP could be applied and runs functionally from catalogue drafts, markers, and other features there are in DISMUS APP.
- (v) Stabilizing Phase (trial). The trial stage where the application product is conducted test tries the appropriateness of material and appropriateness of product customized with Theory knowledge of social media. Thus, DISMUS APP products get criticism and suggestions from expert Theory and expert media. Destination from Step this minimizer and develop an application by functional. Thus, worthily used by learners.

4.2. Process making Livi app

The LIVI application creation process consists of many stages and results of markers that can be explained in Table 1.

Table 1. Stage of manufacture and appearance catalogue.

No.	Steps of manufacture	Appearance catalogue
1.	The design catalogue for introducing the type of temple	

No.	Steps of manufacture	Appearance catalogue
2.	The design using <i>CANVA</i>	
3.	Process making a 3D object using <i>Blender</i>	
4.	Entering model character using <i>Unity</i> marker which has integrated with <i>AR</i>	
5.	The media application using “ <i>DISMUS</i> ”	

A few steps from making an application naturally could produce learning media AR apps for social studies learning. Thus, it is more interesting and real for students. This DISMUS application is not only equipped with reflections on the forms of temples and other relics equipped with voice-over but also applied using learning videos that can be used as an introduction when teaching, as well as learning evaluations such as quizzes or games which contain questions related to

relics, temples. The DISMUS AR application is also equipped with cards as learning media using the flashcard method. This is because the flashcard media used as a marker in AR can facilitate learning. After all, it is simpler than textbooks or other media.

5. Conclusions

The presence of the DISMUS APP is expected to help teachers and students could develop good techniques, especially in Indonesia. The main features contained in the DISMUS APP in the form of AR. This is for students between the ages of 13 and 16 years. This can be used for learning about the Knowledge in Socialization for students at school. It becomes more interesting and has an impact on increasing public awareness of education from an early age. Indeed, if awareness in public increases, it is certain that the purpose of making the DISMUS APP is to give birth-to-soul intellectual students that will succeed and overcome educational problems in Indonesia.

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