AUGMENTED REALITY: NEW APPROACH IN DISTANCE EDUCATION STUDENTS' LEARNING PROCESS

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ABSTRACT

There are several practical courses in the Educational Technology Study Program of Universitas Terbuka which are offered fully online. In these courses, students face some difficulties to reach learning objectives. This study aims to provide media and adequate learning experience for distance education students by using augmented reality. Research and Development design using ADDIE model applied in the study. The results showed that augmented reality media in online tutorials was quite effective in providing learning experiences. Even so, students still face obstacles in using the media, namely the incompatibility of student devices gadgets with the media, and minimal tools to produce instructional video program. A synchronous learning support between students and tutor is required. Augmented reality can bring reality into classroom for distance education students and assist them practice their courses.

Keywords: *augmented reality, ADDIE model, online learning, students learning guide*

1. INTRODUCTION

The Educational Technology Study Program has 6 practical courses, Three-Dimensional Simple Media Production, Learning Web Design, Television Broadcasting Management, Video/Television Media Production and Audio/Radio Media Production. All these courses provided fully online.

The results of the initial analysis showed several characteristics of students, namely, 1) Students were spread unevenly across 20 regional offices with varying numbers. This condition makes it difficult for students to be able to practice in the city they live in because of the regulation that the practice is done at least with the number of 15 students per city, 2). The age of students between 20 - 35 years as much as 70%, who are familiar with technology, attached to gadgets, spend more than 4 hours / day doing activities with the internet, and 3). Students are adults who have worked so it is difficult to practice / intern at a television station or production house in a period between 1 to 2 weeks.

This research is aimed at answering problems 1) what learning media are appropriate to provide a practical learning experience to help students learn in distance education and 2). How appropriate learning design is used for practical courses.

One form of technological benefits that are able to provide real experiences to users is artificial intelligence technology (AI) in the form of augmented reality (AR). Augmented Reality (AR) is defined as a technology that combines 2D and 3D virtual objects into a real environment and then projects them in real time (Roedavan, 2014).i This technology is widely used in business/marketing (Flavian, Sanchez & Orus, 2019; industry (Berg & Vance, 2016); health (Freeman, et al., 2017) and dnaturein education (Merchant, Goetz, Cifuentes, Keeney-Kennicut, & Davis, 2014); Khan, Johnston & Ophoff (2019); Cabero & Barroso, 2016), Yuliono, Sarwanto and Rintayanti, 2018) and Pramono & Setiawan (2019).

Research on the use of AR in Indonesia is quite a lot done, among others, in the field of science, early childhood education and the field of design. Some of these studies include the use of artificial intelligence-based technology in the form of Augmented Reality (AR) Apriyani & Gustianto (2015); Irwansyah, Yusuf & Ramdhani, (2017).

In the context of distance education, research onthe utilization of AR media in distance education learning (PJJ), has not been widely done, as has been reported by Coffin, Bostandjieh, Ford, &hollerer, 2008); Nielsen, Brandt & Swensen, 2016); Lytridis, Tsinakos & Kazanidis, 2018); Viscione & D'elia, 2019, and Saykili, 2019).

Considering the competence of the courses, the distribution and number of students in various regional offices and student characteristics, this research is directed at the development of augmented reality media. This medium has great potential to help students perform course practice assignments in remote education. AR Media will be integrated in online tutorial applications in Video/Television Media Production courses.

Currently, the learning experience given to students in the course is self-study by reading modules, online learning through LMS Moodle, which consists of reading materials, responding in discussions, making assignments, doing formative tests, conducting practices and working on final tests. There is no learning media that supports student practice work. Practice guidance is done through asynchronous online learning.

Augmented Reality media development for Video/Television Media Production Courses is carried out with an Analyze-Design-Develop-Implementation-Evaluation (ADDIE) approach/model. This process is referred to as Instructional System Design/ISD (Branson, 1975). This model can also be applied to curriculum development activities, learning media development or other learning program development. Here are the details of ADDIE model activities in this study.

Analysis /Analyze – Collecting information about the targets of learners who are targeted by AR media, including analysis of geographical conditions, student location, rank owned by students, course assignments, and course materials. The team involved is an instructional expert, namely the lecturers of the Open University Educational Technology Study Program and the functional personnel of Learning Technology Developers. The next step is to analyze and identify media needs for AR media, for example whether it requires video, audio, or multimedia.

Design /Design - Designing course tasks and doing tasks to make them easier for students to do. From this step is also designed learning activities that will be given to students. Products of this stage are AR media scripts, material concept maps and story boards.

Developing/Developing – Producing AR media programs, involving programmers and learning media developers. Products of this stage are 4 AR programs namely Camera, Tripod, Audio and Lighting. Formative evaluation of AR media is carried out during the development process, involving lecturers and Learning Technology Developers.

Implementing /Implement -Implementation of AR in the student learning process through online learningwith Moodle platform. Because of the short development time, there has been no trial, so ar media field trials directly in online classes in March - June 2020. At this stage, media development tests all AR media tosee if the media is working and suitable for the intended audience. This field trial yields input on the pedagogical and technical aspects of AR media.

Evaluation /Evaluate – Evaluation of AR media is also carried out by students in online learning.

2. METHOD

The design of this research is Research and Development, using the ADDIE model (Analyze-Design-Develop- Implement-Evaluate). Research is focused on the development and utilization of AR media by Educational Technology students in online learning. The method used is a one-shot case study experiment, to find out the effectiveness of AR media in the actual classroom, namely in online learning.

The population of this study are students and tutor of Video /Television Media Production, Educational Technology Study Program in 20 regional offices. The sample is determined purposively, which is taking students of the Educational Technology Study Program who register for video / television media production courses in the semester 2020. Data collection is done with Google Forms questionnaires to students and tutors, followed by telephone interviews to students and tutors. The study was conducted in March - June 2020 and September - November 2020. Telephone interviews were conducted by students from 8 regional offices namely Pangkal Pinang, Palembang, Bandar Lampung, Jakarta, Bogor, Semarang, Surabaya and Pontianak. An descriptive analysis is done to interpret the collected data, to be further presented narratively in the discussion of research results.

3. RESULTS AND DISCUSSION

This research generated input related to the level of difficulty of students in understanding the material and doing tasks in this course, 58.3% of students stated that the difficulty level of this course is quite high, 33.3% stated that this course has a high level of difficulty. Technical difficulties such as difficulty opening web-based applications, require large HP memory, while gadget devices owned by students are standard devices, and minimal production tools such as gadgets, simple tripods, AR / VR glasses. There are a lot of students who don't have these devices. However, 8.3% of students think the course is not difficult for them because they have access to standard production equipment, such as those borrowed from schools.

Figure 1
Student Opinions About The Difficulty Level of The Course
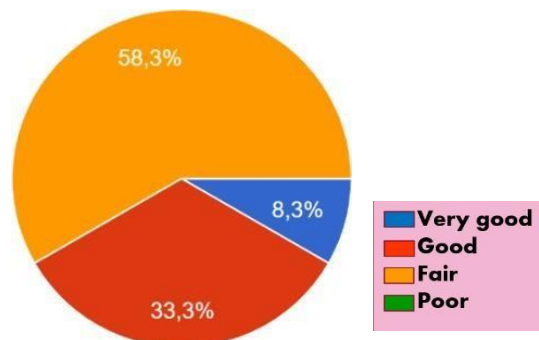
Regarding students' perception of their ability to understand course materials, the data showed that they can absorb the material well, stated by 91.7% of students. This can be interpreted that the competencies demanded in this course can be well received by students.

Figure 2
*Student Opinions About The Level of Ability to Understand Material*
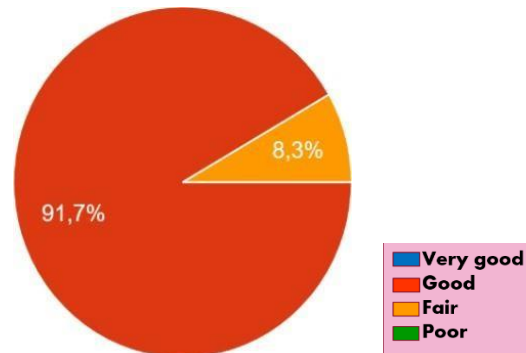
Regarding the suitability of AR media to the achievement of subject competencies, 25% of students think that AR media used in courses is less in accordance with the competence of the course, and 75% of students state that AR media is appropriate for the competence of this course.

Figure 3.
Suitability of AR Media with Learning Objectives
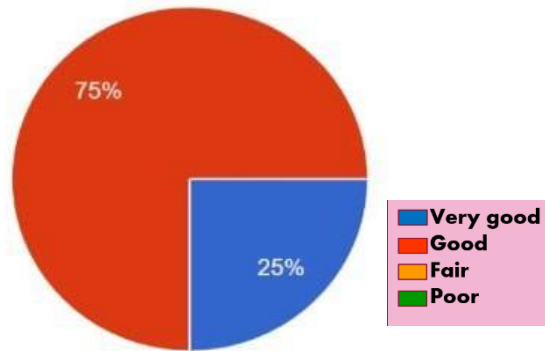
About the ability of students in using AR media, 8.3% of students stated that their ability is very good in using AR media, while 83.3% of students stated their ability both in using AR media and another 8.3% they are quite capable of using AR media. AR media in the course is designed to provide a learning experience that is in accordance with the competence of the course. To that end, students are expected to be active in self-study through modules, AR media and other sources that they can find themselves.

Figure 4.
Student Opinions on the Ability to Use AR Media
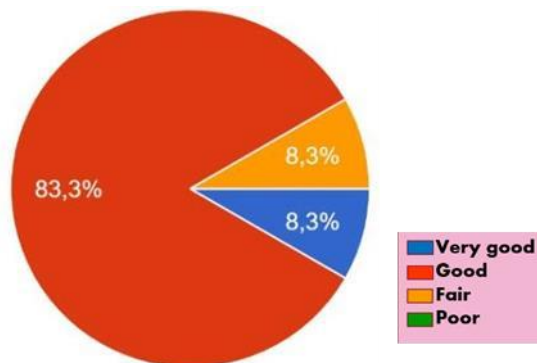
The activeness of students in using AR media in this course is described by 25% of students who stated they are very active in doing practical tasks and 58.3% of students who state they actively use AR media during the course, while 8.3% stated that they are not actively using this AR media. The inactivity of students in doing practical tasks is caused, among others, because they do not have tools as depicted in the teaching materials module. In addition, there are also network constraint factors and limited tool constraints. In addition, they also need

discussions with lecturers / tutors and colleagues in learning, to discuss about course tasks

Figure 5.
Student Opinions About Activeness Doing Practical Tasks
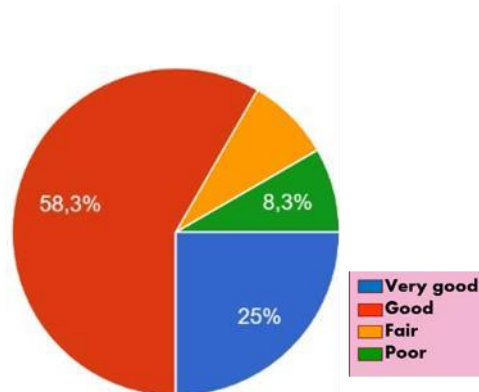
Related to the allocation and determination of time to do the task, students provide input so that the course assignment should be divided more evenly the time of work, so that they have the opportunity to do the task with sufficient time. Currently they argue, the course assignment as many as 7 tasks are still too close to the time 1 with the others. Nonetheless, they argue the time to do the task is sufficient.

Figure 6 –
Student Opinions on Task Time Allocation
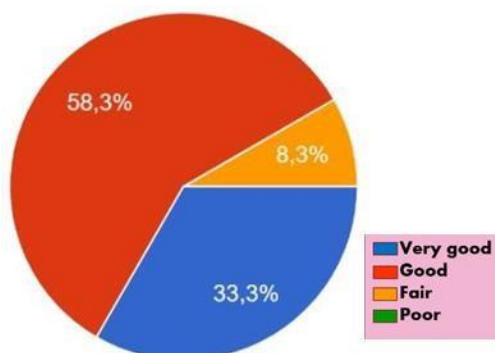
Although it has been supplemented with Practice Guide, students argue that these practice guidelines have not fully helped them understand coursework. So that they need to have online synchronous guidance for consultation sessions through applications such as Zoom, Google Meet or other applications. This is also asked by students so that they can get to know their lecturers better. The Study Program needs to improve design of the course in the following semester, including improving AR media and its devices to make it more accessible to students.

4. CONCLUSION

Augmented reality media for practicing courses is quite effective in providing a learning experience to students. This finding is in line with the previous research done by Nielsen, Brandt & Swensen (2016) and Saykili (2019). AR media also enhance students motivation in learning as indicates by Mustaqim's findings (2016), Khan, Johnton & Ophoff (2019) that the utilization of AR media can increase students' interest and motivation in learning due to the nature of Augmented Reality that combines virtual world that can increase the imagination of learners with the real world directly.

Nevertheless, students still face obstacles in using AR media. The biggest obstacle experienced by students is the incompatibility of student gadget devices with AR media, which causes students not entirely able to utilize the media to learn. In addition, they also do not have the minimal tools needed to produce a learning video program, such as tripods, lights for lighting. The results of this study show that the learning experience conducted through a full network (fully online) is perceived as not adequate to achieve the learning objectives of the course. Students need to have synchronous guidance to discuss assignments, as well as they need to communicate with other students and lecturers.

Limitations of this study are that the sample in this study is very limited because the number of students who took courses was 26 people and who responded to answer questionnaires as many as 12 people. For this reason, advanced studies are needed to test the effectiveness of AR media in practical courses with adequate number of sample.

5. ACKNOWLEDGMENT

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