The Validity and Practicality of Augmented Reality Based Learning Media for Computer Basics Courses

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Abstract. "Augmented Reality is a technology that gets a lot of attention because it can combine text and image media into its world with these advantages. Augmented reality is expected to be a solution in the need for learning media in this study will reveal the validity and practicality of augmented reality-based learning media with research subject students majoring in technology curriculum in the field of education at Padang State University with the results of the study showing that augmented reality based media is valid and practical for lecturers and students.

Keywords: Learning media, augmented reality, computer basics

1. Introduction

Education is one way to improve abilities people in the field of science and technology but in its application it is very different, where the learning process still uses textbooks a lot. As a result, many learning processes are not maximally conveyed due to the lack of supporting media and learning facilities besides the limitations of the teaching and learning process in the classroom which make students lack understanding outside of their hours. Lessons because of the limited ability of textbooks in courses, especially in the field of practice which shows many forms of physical objects that may not be found outside of class hours, this study aims to develop alternative learning media in the form of augmented reality which is an application that can combine virtual objects in the form, text, pictures, and animations into the real world.

Augmented reality is one of the methods that can be utilized in learning because it has advantages in combining Text, image and animation media into the real world so that users can explore objects with a more detailed perspective, especially practical courses that show a lot of tools that can only be used look in the laboratory.

Computer basics courses are difficult to study outside lecture hours because the textbook cannot describe objects in detail. The lecture hours for computer basics courses are also very few even though basic computer courses are the basis that must be learned for the next computer course.

A. Definition of learning media

The National Education Association (NEA) has a different view with some of the opinions above. The NEA believes that "media are forms of communication both printed and audio-visual as well as their equipment. Media should be manipulated, can be seen, heard and read (Arief S. Sadiman, DKK 2011: 7)"

Gerlach & Ely (1971) in Arsyad (2011: 3)[2] say that “media when understood in broad terms is human, material, or incidents build conditions that make students able to acquire knowledge, skill or attitude. In this sense, the lecturer, text, and campus environment is a medium. More specifically, the meaning of media in the learning process teaching tends to be interpreted as graphic, photographic, or electronic means to capture, process, and reconstruct visual or verbal information. According to Daryanto (2011: 4)[3], in essence, the teaching and learning process is a communication process, delivering messages from the introduction to the recipient. Messages in the form of content or
teachings are poured into communication symbols both verbally and nonverbally. This process is
called encoding. The interpretation of these communication symbols by students is called decoding. In
this interpretation, there are times it works and there are times it doesn't work or it fails. That failure
caused by a disturbance that hinders communication in the process communication is known as
barriers or noise.

Based on some opinions on the understanding of learning media it can be concluded that
learning media is everything that can be the intermediary sending the message to the recipient of
the message from the simplest tool to the most sophisticated tool. If exemplified by the present day, the
simplest tool is a message from mouth to the most sophisticated tool today is teleconference.

Learning Media Functions, Levied an Lentz in Cecep (2011: 21-22)[4] suggests four functions
learning media, especially visual media, namely:

a) The function of visual media attention is at the core, namely to attract and direct student attention
to concentrate on the content of the related lesson
b) with the visual meaning displayed or accompanying the material text
c) Function the effect of visual media can be seen from the level of enjoyment of students when
learning (or reading) pictorial text,
d) Cognitive function of visual media seen from the research findings which reveal that emblem
visuals or images facilitate the achievement of goals to understand and interested in the information
or message contained in the image
e) Function compensatory learning media can be seen from the results of the research that the media
visuals provide context for understanding the text helps students who weak in reading to organize
information in text and remember it again.

Based on the expert opinion above about the function of learning media, it can it is concluded
that the appropriate and varied use of the media can
overcome the passive attitude of students so that it can generate interest in learn and allow students to
study independently. According to Azhar (2009: 26-27)[5] the benefits of learning media are as
follows:

a) Learning media can clarify the presentation of messages and information so that it can expedite and
improve the process and learning outcomes.
b) Learning media can increase and direct attention
c) children so that they can generate motivation to learn, more interaction direct between students and
their environment, and possibilities students to study on their own according to their abilities and
d) interest.
e) Learning media can overcome the limitations of senses, space and time;
f) Learning media can provide similar experiences to students about events in their environment, as
well as possible the occurrence of direct interaction with teachers / lecturers, the community and
the environment

B. Augmented Reality

Ronal Tazuma (1979)[6] explains that augmented reality technology that combines the real
world and the virtual world, runs interactively, real time and 3-dimensional animation. According to
Stephen, and Fiala, in Mustika (2015: 278)[7], Augmented Reality is a technology that combines two-
dimensional or three-dimensional virtual objects and then projects the virtual objects in real time.

C. Augmented reality on education

AR has great potential in education, and more amazingly, opening new fields and creating
different learning. AR offers innovative learning spaces by combining digital learning materials into
media formats with tools or objects, which actually create "situated learning". According to Goel and
Bhardwaj (2014)[8] AR is based on digital learning that can run normally with mobile devices such as
iPhones, iPads, Smartphones, PCs,
tablets, etc., users can download the application. AR can be used in education to show models that cannot be seen in the real world to students. For example, planets and galaxies that are too big, and atoms and molecules that are too small. According to Yuen, Yaoyuneong, and Johnson (2011)[9] explain the benefits of AR technology in learning that has several advantages, namely: 1) Has enormous potential and enormous benefits for the development of teaching and learning environment; 2) Has the potential to involve, stimulate, and motivate students to explore class material from different angles; 3) Help teach subjects where students cannot reach in the real world and provide real experiences to students (e.g., astronomy and geography); 4) Increase collaboration between students and instructors and among students; 5) Train the creativity and imagination of students; 6) Helping students master their learning at their own pace and on their own path, making real learning appropriate for various learning methods;

D. Computer Basics

CSAB (Computer Sciences Accreditation Board) in Supriyanto (2005)[10] defines computer science as computer science and computing. In it there are theories, experiments, and component design, as well as including matters relating to theories to understand computer devices, programs, and systems.

Computer basics as one of the compulsory subjects that are the basis of computer learning in the curriculum and educational technology majors, computer basics courses are courses that study computers covering history, hardware, software and brainware work on basic courses computer basics will have many explanations

2. Methodology

This type of research is development research known as Research and Development (R&D) The development model that will be used is 4-D

3. Result and Discussion:

This research produces an augmented reality-based learning media product in the form of modules and applications. The stages undertaken to produce augmented reality-based learning media are as follows:

A. Define Stage

1. Observation

This research was conducted in the study program of educational technology at the Faculty of Education UNP with a focus of research for students who are currently taking Computer Basics course. Basic computer courses are courses at the beginning of the semester for students, currently there are a total of students taking courses This lecture numbered 113 people with a total of 4 sections and each section contained 20-25 students

2. Study Literature

In developing the product at the define stage, a literature study is conducted to assist the researcher in collecting the main material using existing source books or subjects from the internet. In addition, the material to be loaded on the development of augmented reality-based media is also based on existing syllabus and lesson plans.

B. Design Phase

This stage is the design phase and the initial preparation of modules and applications

3. Development phase (develop)

a. Validation Stage
The data that will be used to measure the validity of this augmented reality-based learning is data obtained through input from the validator. Researchers gave questionnaires to three validators. Validation data were obtained from material and media experts who are lecturers in the computer basics course with the following validation format.

| Aspect | Indicator          |
|--------|--------------------|
| Material in the module | The Truth of Concepts |
|         | Presentation of Material |
|         | Writing             |
|         | Legibility          |
|         | Evaluation          |

Material expert judgment data are reviewed from (1) The truth of the concept translated into 3 questions obtains an average of 90 with the criteria "valid with mild revision" (2) Presentation of the material translated into 5 questions gets an average of 86.67 with the criteria "valid with revision light ", (3) Writing down into 3 items obtains an average of 886.67 with the criteria' valid with mild revision (4) readability translated into 2 items obtaining a mean of 100 with criteria "valid" Evaluation translated into 3 items the question got an average of 93.33 with the criteria "valid with mild revision"

Overall, the level of validation from media experts obtained an average of 91.33 with the criteria "valid with mild revision". The figures obtained indicate that this interactive multimedia learning media can be used after minor revisions.

A. Practicality Stage

Augmented reality-based media practicality test data on a computer basics course is taken from practical data by a lecturer in computer basics and students who take a computer basics course

| No | Aspect | item | Average | Practicality | Serenity |
|----|--------|------|---------|--------------|----------|
| 1  | Media display | 1,2,3 | 4.43 | 89 | very practical |
| 2  | presentation of the material | 4,5,6,7 | 4.51 | 90 | very practical |
| 3  | expedience | 8,9,10 | 4.62 | 92.3 | very practical |
| Total |          |      | 13.56 | 90 | very practical |
Evaluation data on the results of the learning media trial in terms of (1) media display which is broken down into 3 items obtains an average of 89 with "very practical" criteria (2) presentation of material translated into 4 items obtains an average of 90 with criteria "very practical and (3) the benefits elaborated into 3 questions get an average of 92.3 with very practical criteria.

Overall, the practicality level of the results of trials on students obtained an average of 90 with "very practical" criteria. Based on practicality data by students majoring in KTP FIP UNP who took computer basics course in section KTP1.61.1207, it can be seen that from the aspects assessed in general students' responses to the media used were positive with very practical criteria.

4. Conclusion

a. Development of Augmented Reality-based learning media in computer basics courses in the FIP UNP educational technology department using applications.

b. The results of the description of the assessment data by the validator from the material and media aspects show that the interactive multimedia media product with material validity is 91.33 with the category "valid with mild revision", the media validity is 94.67 with the category "valid with mild revision". So that the developed media can be categorized as valid with minor revisions.

c. The description of limited trial data shows that products equipped with practical aspects with interactive media criterion variables regarding appearance, convenience, presentation of material and usefulness based on the view of the lecturer obtained a percentage of 98 with a "very practical" criterion while the usefulness based on the view of the lecturer obtained a percentage of 90 with the criteria "very practical"

Recommendation

1. Based on the research that has been done, this Augmented Reality-based learning media is fit to be used as an interesting learning media for lecturers and students in the KTP FIP UNP major
2. This development phase has not been perfect related to disseminate which is the stage of product use on a broader scale, so this research is suggested to be developed further in subsequent studies.

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