

The Effect of Augmented Reality-based Learning Media on Student Learning Motivation for Computer Course

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Abstract: Augmented reality is one of the most developed technologies today. Augmented reality has the advantage of visualizing objects in 3D form against the object in the marker. The advantages of Augmented Reality can be utilized in education, especially to visualize objects that are difficult to visualize. This study aims to determine the effect of augmented reality-based learning media on learning motivation. This research is quantitative research with an experimental quasi approach. This research was conducted in two classes namely the experimental class, namely the class that was given augmented reality-based learning media, and the control class using conventional methods. Data collection techniques were taken using tests and questionnaires. The population in this study were all students of the educational technology curriculum who took computer basics courses. To determine the results of the hypothesis, the normality test, homogeneity test, and hypothesis testing were carried out.

1 INTRODUCTION

Your paper will be part of the conference proceedings therefore we ask that authors follow the guidelines. The pandemic that has occurred in the last few years has caused the learning process to be unable to be done face-to-face, and learning has to be done remotely or online. The distance learning process that occurred during the pandemic period caused problems for students because they were not prepared for the implementation of distance learning, such as the readiness of infrastructure and the lack of intensive interaction between students and lecturers in discussing lecture material. When students have difficulty in understanding the course material, the opportunity to ask questions is very limited, not to mention that there are quite a lot of assignments from other lecturers. Conditions like this can cause learning saturation and have an impact on low learning motivation. In terms of motivation, it is an important requirement in learning activities. Some research results state that one of the most important things in the learning process both online and offline is the motivation to learn for students (Bekele, 2010). Motivation is a key factor in face-to-face learning as well as in online learning (Jones & Issroff, 2007). According to Jacobson, R. R., and Harris, S. M.

(2008), what is needed is self-regulation in online learning for adults, according to Zimmerman. Students who have self-regulation are students who have metacognitive, motivational, and behavioral activity in the learning process.

In the online learning process, lecturers are required to always innovate to provide a good learning atmosphere with various uses of learning media, this is because the interaction process in online learning is very limited. media is needed and can motivate students in learning so that students have the motivation to manage their learning. Learning media is also expected to be able to overcome the limitations of infrastructure, both in terms of quantity and quality. To overcome these problems, several learning media can be an alternative to online learning, one of which is augmented reality. Ronald Tazuma (1979) stated that augmented reality is a technology that combines the real world and the virtual world, running interactively, in real-time, and in 3D animation. According to Stephen and Fiala (in Mustika, 2015: 278), augmented reality (AR) is a natural way to explore 3D objects and data. AR is a concept that combines virtual reality with world reality. Thus, two-dimensional (2D) or three-dimensional (3D) virtual objects seem real and blend with the real world. In AR technology, users can see

the real world around them by adding virtual objects generated by the computer.

One of the advantages possessed by augmented reality is that books and visual images displayed can provide opportunities for students to meet the need for learning facilities outside of lecture hours. This study aims to measure the effect of augmented reality-based learning media on student learning motivation during online lectures.

2 METHOD

This type of research is quantitative research using a quasi-experimental approach. This research was conducted in two classes, namely the experimental class with 27 students and the control class with 23 students. The sample used in this study were students of the Education Technology Curriculum Department of FIP UNP who took computer courses and operating systems, while the selection of course classes was based on practical lectures.

The hypotheses in this research are:

H0: There is no effect of using augmented reality-based learning media on students' learning motivation

Ha: There is an effect of using augmented reality-based learning media on students' learning motivation

3 RESULT

The following is data from research that has been carried out at the Department of Curriculum and Education Technology (KTP), FIP UNP, in section 202010040136 with 27 students as experimental class and section 202010040138 with 23 students as control class. Based on the results of research obtained from a motivation questionnaire.

Table 1: Education technology student learning motivation.

Class	N	Maximum Score	Average	Standard Deviation
Experimen	27	200	124.15	4.512
Control	23	200	119.65	6.020

The results of the research described in table 1 above show that the average score of student learning motivation for the experimental class is 124.15 while the control class is 119.65 from a maximum score of 200.

Before testing the hypothesis, the analysis requirements were first tested, namely student motivation data on augmented reality-based learning media through the normality test of the effect of augmented reality-based learning media between the experimental class and the control class. The normality test was carried out using the Liliefors test at a significant rate of $\alpha = 0.05$

Table 2: Normality test.

Kolmogorov Smirnov				
Motivation to learn	Class	Statistic	Df	Sig.
	Experiment	.091	27	.200
	Control	.130	23	.200

Based on the data from the calculations carried out for the normality test, the results of the normality test are normally distributed on each variable with a significance value greater than 0.05. The next stage is measuring homogeneity, based on the calculation, the results are as follows:

Table 3: Homogeneity Test.

		Levene statistic	Df1	Df2	Sig.
Motivation to learn	Based Mean	1.449	1	48	.235
	Based Median	1.071	1	48	.306
	Based on median and adjusted df	1.071	1	39.993	.307
	Based on Trimmed Mean	1.356	1	48	.250

Based on the results of the calculations as illustrated in table 3 above, it shows that the mean significance value is > 0.05 so it can be concluded that the data is homogeneous.

Table 4: Student Learning Motivation.

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	251.055	1	251.055	9.064	.004
Within Groups	1326.625	46	27.638		
Total	1577.680	49			

To find out whether there are differences in the learning motivation of the two classes, it can be seen in Table 4, the results show Sig. obtained P-value (P-value) = 0.04. at the level of significance = 0.05. Thus, it can be concluded that H0 is rejected, meaning that there are differences in student learning motivation between the two classes.

After the preconditioning test has been carried out, a hypothesis test will be carried out using the T-test with the following results:

Table 5: Differences in student learning motivation using augmented reality-based learning media and without using augmented reality learning media.

Motivation to learn	Class	N	Mean	Std. Deviation	Std Error Mean
	Experiment	27	124.15	4.512	.868
	Control	23	119.65	6.020	1.255

		Sig. (2-tailed)	Mean difference	Std. Error Difference
Motivation to learn	Equal Variances assumed	.004	4.496	1.492
	Equal variance not assumed	.005	4.496	1.526

Based on the data presented in table 5 above, the Sig (2-tailed) value is $0.04 < 0.05$, it can be concluded that there is a difference in the average student learning motivation between classes using augmented reality-based learning media and without using augmented reality learning media. with a mean value of 124.15 for the experimental class and 119.65 for the control class.

4 DISCUSION

Augmented reality learning media can be a choice in the implementation of distance lectures (online), to avoid a decrease in student learning motivation, especially in practical courses. The advantage of augmented reality (AR) learning media is that it can provide visual images and reading materials that are much needed in independent learning. In addition, the use of AR also makes a significant contribution to the learning process, namely, the learning process is more student-centered (students), so students are required to be more independent. Distance learning (online) will be successful if students have independence in doing their tasks well. This independent ability in learning can indirectly affect their learning motivation. According to (Dunleavy & Dede, 2014). independence and self-regulation can increase intrinsic motivation, namely through interest/pleasure, perceived choice, and perceived competence. Ryan and Deci (2000a; 2000b) emphasize the importance of student-centered learning in adult education, stating that if the learning process is not student-centered (students), it can hinder learning success (Kerawalla et al., 2006).

Based on the findings of this research, it shows that in the control group that does not use AR, whose lecture process is more lecturer-centered, the students tend to be passive and do not have a good preparation before attending lectures, and vice versa. Experiments also show that the use of AR is very useful for recognizing the shapes of devices on a computer. This is under the results of the research reported by Jia, Chen, Ding, and Ruan (2012) which shows that if the lecturer (instructor) provides more interesting learning environments for students to gain knowledge, the learning process can also be improved with the use of mobile this can increase higher learning motivation. (Liu & Chu, 2010; Perry, 2015). The results of this study are also following the opinion of Huang (2009) that the use of augmented reality media can increase students' enthusiasm and perseverance in learning. According to Safar, Al-Jafar, and Al-Yousefi (2017) also state that teaching using augmented reality has a more positive effect than traditional teaching methods.

5 CONCLUSION

This research is a study that compares the use of learning media and learning that is carried out without learning media. This study aims to see the effect of learning media on student learning motivation, especially when learning is brave in the pandemic era. Based on these findings, it can be stated that augmented reality-based learning media affects student learning motivation, especially for computer courses and operating systems. Students who take part in learning using augmented reality media have higher learning motivation than those who study without augmented reality media. Learning by using augmented reality media, students become more independent and diligent.

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