

THE EFFECT OF APPLICATION-BASED AUGMENTED REALITY TECHNOLOGY AS LEARNING MEDIA ON THE LEARNING OUTCOMES OF MAN 1 PADANGSIDIMPUN PLUS RISET STUDENTS

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Abstract. This study was conducted to determine the use of application-based augmented reality technology as a learning medium to influence student learning outcomes at MAN 1 Padangsidimpunan Plus Research. This research is a quantitative research using experimental research methods. The experiment used is the use of application-based augmented reality technology as a learning medium which will be carried out in class XI MAN 1 Padangsidimpunan Plus Research. The data collection techniques used in this study used test, questionnaire, and observation instruments. Data analysis was carried out using simple linear regression analysis. The results of the research that will be obtained are in the form of the significance of the hypothesis test on the learning outcomes of students in the experimental class after receiving the treatment of using application-based augmented reality technology as a learning medium. Based on the results of a simple linear regression analysis test using IBM SPSS Statistics 25 software, the significance value obtained was $0.026 < 0.05$. That there was an influence of the use of application-based augmented reality technology as a learning medium on the learning outcomes of MAN 1 Padangsidimpunan Plus Research students.

Keywords: Learning Media, Augmented Reality Technology, Learning Outcomes

Abstrak. Penelitian ini dilakukan untuk mengetahui penggunaan teknologi augmented reality berbasis aplikasi sebagai media pembelajaran memberikan pengaruh terhadap hasil belajar siswa di MAN 1 Padangsidimpunan Plus Riset. Penelitian ini merupakan penelitian kuantitatif dengan menggunakan metode penelitian eksperimen. Eksperimen yang digunakan adalah pemanfaatan teknologi augmented reality berbasis aplikasi sebagai media pembelajaran yang akan dilaksanakan pada kelas XI MAN 1 Padangsidimpunan Plus Riset. Teknik pengumpulan data yang digunakan dalam penelitian ini menggunakan instrumen tes, angket, dan observasi. Analisis data dilakukan menggunakan analisis regresi linear sederhana. Hasil penelitian yang akan diperoleh berupa tingkat signifikansi uji hipotesis terhadap hasil belajar siswa kelas eksperimen setelah mendapatkan perlakuan penggunaan teknologi augmented reality berbasis aplikasi sebagai media pembelajaran. Berdasarkan hasil uji analisis regresi linier sederhana dengan menggunakan software IBM SPSS Statistics 25 menunjukkan nilai signifikansi yang diperoleh sebesar $0,026 < 0,05$. Terdapat pengaruh penggunaan teknologi *augmented reality* berbasis aplikasi sebagai media pembelajaran terhadap hasil belajar siswa MAN 1 Padangsidimpunan Plus Riset.

Kata Kunci: Media Pembelajaran, Teknologi Augmented Reality, Hasil Belajar

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INTRODUCTION

Education is an activity carried out by humans since childhood to be able to continue to develop. Before being taught by teachers at school, humans have received education from simple things taught by parents starting from learning to say words, walking, and continuing until they are able to think to make a decision. Education then continues at school to gain broader and more diverse knowledge. Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have intelligence and skills (Aspi, 2022). One way to prepare students for the future and help them learn to gain a different perspective is by utilizing learning media that follows technological developments and is integrated into classroom learning (Santanapurba & Hidayanti, 2022).

According to Gagne & Briggs (2020) learning media are tools that are physically used to convey the content of learning materials. Learning media is one of the components that support the process of teaching and learning activities. Learning media is also one of the factors that support the success of the learning process in schools because it can help the process of delivering information from teachers to students or vice versa (Muhtar, et al, 2020). Learning media is one of the strategies to present an interesting and fun learning experience, so that students are able to carry out various activities when using the learning media. This is in accordance with the targets and objectives of a learning activity to see the impact and learning outcomes to be achieved from a learning activity (Kemp & Dayton, 2022).

Technology plays an important role in modern education, offering many benefits and opportunities for students and teachers. Technology can help to create an interactive and engaging learning environment, which can improve understanding and retention of information (Elmira, 2023:461). This is because today's students are growing up in a time when technology is developing very rapidly. With the rapidly changing world of technology, teachers are expected to work hard to incorporate technology into the teaching process so as to increase students' needs in learning. Learning using technology must be created, used, developed and managed to meet learning needs with the intention of achieving effectiveness and efficiency in the learning process (Anomeisa & Ernaningsih, 2022).

One form of learning media that can be used in learning is by using visual media. Visual media is media that can be captured with the sense of sight. Messages contained in visual learning media can be verbal and non-verbal messages (Pagarra, et al, 2022). Augmented reality technology is one form of visual learning media that can be used in the learning process. Augmented reality technology is a technology that has the ability to describe a certain process

or simulation (Johnson, 2021). According to Khilda (2021) the use of augmented reality technology as a learning media is a structured series of activities where there is interaction between students, teachers and teaching materials by utilizing augmented reality technology in a conducive learning environment so as to achieve the expected goals.

Based on the results of observations that have been made during the implementation of the Pengenalan Lapangan Persekolahan II (PLP II) on August 4 to October 4, 2022 at MAN 1 Padangsidempuan Plus Riset, MAN 1 Padangsidempuan Plus Riset strives to be able to continue to improve the quality of education by preparing quality learning needs to students. However, there are several obstacles to realizing this, one of which is the lack of learning media to support learning activities in mathematics subjects. Learning that is carried out still uses book media, Lembar Kerja Siswa (LKS) and the blackboard, so that the learning media used is less varied. This makes the lack of intensity of the two-way interaction process between teachers and students, where the learning media used by teachers so far still tend to be teacher-centered.

According to Hamalik (2021) learning outcomes are abilities that can be seen from changes in perception and behavior. Decisions about learning outcomes are a must for a teacher in order to know whether students are successful or not in the learning process (Sudirman, 2020). Based on the results of observations made by the author at MAN 1 Padangsidempuan Plus Riset, data were obtained on student mathematics learning outcomes for class XI midterm assessments with Kriteria Ketuntasan Minimal (KKM) 70, the average score obtained by students was 60,29. With a student pass percentage of 46%. So that the learning outcomes of class XI students are still a lot below the Kriteria Ketuntasan Minimal (KKM). Limited learning media and students who are not much involved in the learning process, cause a lack of student learning activities in using existing learning media.

According to Aditama, et al, (2019) learning media with the use of augmented reality is an intermediary tool between educators and students in learning that is able to connect, inform and distribute messages so as to create an effective and efficient learning process. In accordance with the results of research conducted by Aryanti (2023) which says that the use of augmented reality technology has a significant effect on student learning outcomes. Augmented reality technology is a technology that has great opportunities in the field of education, because this technology displays interesting visuals that can be seen in real time. This is because the application of learning media by utilizing augmented reality technology can assist teachers in creating active and enjoyable learning.

METHOD

The type of research that researchers use in this study is quantitative research using experimental methods. According to (Sugiyono, 2019) quantitative research can be interpreted as research based on the philosophy of positivism, used to research on certain populations or samples, data collection using research instruments, data analysis is quantitative / statistical, with the aim of testing the hypothesis set. Quantitative research is research whose data is in the form of numbers and its analysis uses statistics. The experimental research method can be interpreted as a research method used to find the effect of certain treatments on others under controlled conditions (Sugiyono, 2019:107). The experimental method is used to determine whether there is an effect of using application-based augmented reality technology as a learning medium on student learning outcomes at MAN 1 Padangsidimpuan Plus Riset. The design used in this research is pre-experimental design. Pre-experimental design is a research design that involves one experimental class without a control class, and the sample is not randomly selected (Sugiyono, 2019:109), with a one shot case study design

RESULT AND DISCUSSION

This study examines the effect of using application-based augmented reality technology as a learning medium on the learning outcomes of MAN 1 Padangsidimpuan Plus Riset students. Based on the results of simple linear regression analysis of the effect of using application-based augmented reality technology as a learning medium on student learning outcomes, the equation obtained is $Y = 0,738 + 0,884X$. The constant value (a) is 0,738, meaning that student learning outcomes will be worth 0,738 if application-based augmented reality technology as a learning medium is equal to zero. Furthermore, the regression coefficient value (b) of the application-based augmented reality technology variable as a learning medium is 0,884, meaning that if the use of application-based augmented reality technology as a learning medium increases by one unit, student learning outcomes will increase by 0,884 units.

Based on the results of this study, there is a positive influence between the use of application-based augmented reality technology as a learning medium on student learning outcomes. This is in accordance with the opinion (Sheehy, et al, 2021:2) which states that learning using augmented reality is a promising strategy to support the teaching and learning process. Then research conducted by (Setiowati, 2019:65) states that students who have used augmented reality applications in the learning process get better learning outcomes. The result obtained a significance value of 0,026, which means that there is an effect of using application-

based augmented reality technology as a learning medium on the learning outcomes of MAN 1 Padangsidimpuan Plus Riset students because the significance value is $< 0,05$.

In addition, the use of application-based augmented reality technology as learning media also has a positive effect on the learning activities of MAN 1 Padangsidimpuan Plus Riset students. Where the results of simple linear regression analysis obtained the equation $Y = 5,432 + 0,920X$, the equation shows a constant value (a) of 5,432, meaning that student learning activity will be worth 5,432 if application-based augmented reality technology as a learning medium is equal to zero. Furthermore, the regression coefficient value (b) of the application-based augmented reality technology variable as a learning medium is 0,920, meaning that if the use of application-based augmented reality technology as a learning medium increases by one unit, student learning activity will increase by 0,920 units.

Based on the results of this study, there is a positive influence between the use of application-based augmented reality technology as learning media on student learning activities. This is in accordance with the opinion (Meyer, et al, 2021) which states that augmented reality technology can help to maximize the subject matter presented, because it supports various ways of representation, action, and various ways of involving students in the learning process. The result obtained a significance value of 0,00, which means that there is an effect of using application-based augmented reality technology as learning media on the learning activities of MAN 1 Padangsidimpuan Plus Riset students because the significance value is $< 0,05$.

CONCLUSION

There is an effect of using application-based augmented reality technology as a learning medium on the learning outcomes of MAN 1 Padangsidimpuan Plus Riset students. This is based on the results of the significance test on simple linear regression analysis, where the significance obtained is 0,026. Then the equation $Y = 0,738 + 0,884X$ is obtained, meaning that if the independent variable (X) or the use of application-based augmented reality technology as a learning medium increases by one unit, then student learning outcomes will increase by 0,884 units. So that the use of application-based augmented reality technology as a learning medium has a positive effect on student learning outcomes. There is an effect of using application-based augmented reality technology as learning media on the learning activities of MAN 1 Padangsidimpuan Plus Research students. This is based on the results of the significance test on simple linear regression analysis, where the significance obtained is 0,00. Then the equation $Y = 5,432 + 0,920X$ is obtained, meaning that if the independent

variable (X) or the use of application-based augmented reality technology as a learning medium increases by one unit, the student learning activity will increase by 0,920X. So that the use of application-based augmented reality technology as a learning medium has a positive effect on student learning activities

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