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The Effect of Augmented Reality as Learning Media on Table Tennis Learning Interest

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Abstract

This study aims to see the effect of augmented reality as a learning media on interest in learning table tennis. The research method used is a quasi-experimental method with the research design The Maching Only Pretest-Posttest Control Group Design. The results of this study indicate that the pretest results of students' learning interest show that there is a difference between the average value of learning interest. The average of the experimental class (72.34) is greater than the average value of learning interest in the control class (72.04). To determine whether the difference is significant or not, it is necessary to test the difference. The conclusion in this study based on the results of the t-test shows that the pretest value of learning interest is 0.48 smaller than the t table value at a significant level of 5%. So it can be concluded that there is no difference in the initial ability of experimental and control class students. The prerequisite test results show that the experimental and control class data are normal and homogeneous so that the para-metric statistical test is carried out, namely the t-test. So it can be concluded that there is a significant difference in student learning interest between the experimental class and the control class.

Keywords: *Effect of AR, Learning Media, Table Tennis*

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INTRODUCTION

In Indonesia, the sport of table tennis is in great demand by the community to remote areas. The popularity of table tennis in Indonesia is quite high. This can be seen from the many table tennis associations (PTM) that grow and develop in each region. Table tennis is also made one of the extracurricular activities in schools that many students like (Zubir et al., 2024). Table tennis matches are quite often organized at the regional and national levels. Indonesia's participation in table tennis matches at the international and regional levels illustrates how Indonesian people have a high interest in this sport. This is because table tennis is a relatively easy sport to learn and fun to play. Table tennis can be played not only at the youth age level, but also children and parents, men and women. This is because this sport is not too complicated to play (Firmansyah et al., 2021).

Table tennis is a game played by 2 people (single) or 4 people (double) using a specially designed racket called bet, 44 mm ball weighing 2.7 grams made of celluloid material, with a table field that is limited by a net as a table divider (Liskustyawati et al., 2019). The concept of playing table tennis is to try to put the ball into the opponent's table as much as possible. So it requires skill in placing the ball. A directed blow with a

placement that is difficult for the opponent to reach is the most important thing in playing table tennis. This aims to make it difficult for the opponent to return the ball. The skill of directing a target with a specific purpose without making a mistake is an ability that every table tennis athlete must have (Pranata & Widiastuti, 2018).

To be able to master the skills in hitting the ball, it must have basic techniques that must be learned and trained. Every technique in table tennis has an important function in playing table tennis. A table tennis athlete who has good hitting ability must be supported by the basic techniques of playing good table tennis. One of the basic techniques in playing table tennis is the forehand drive technique. Forehand drive is a technique that must be mastered by every table tennis athlete (Qoid Falahi & Andrijanto, 2019; Tunggal & Apriyanto, 2022). The forehand drive is the foundation of the attack shot (Asri et al., 2017; Martiwa et al., 2022). The forehand drive is also called the punch of all attack techniques. Every athlete, especially beginner athletes, must master this stroke technique (Hasmarita & Kurnia, 2020; Jusrianto AS, 2020; Sakti Rumpoko, n.d.).

A good training program is one of the determinants in the success of every sport, programmed training can produce a good training process. Success in the training process is highly dependent on the quality of the training carried out, because the training process is a combination of activities from several supporting factors, especially by the circumstances and abilities of the coach and the athlete (Kurnia & Or, n.d.). In addition to the training program, evaluation also has an important role in the athlete development process. Any kind of training program cannot be separated from evaluation, because with the evaluation of the coach it will be easier to provide input, correct, correct mistakes, and assess the success of the training process carried out by athletes.

In fact, in the training process, evaluation is not carried out, even if there is an evaluation it is carried out by table tennis coaches without using standardized instruments, this is because there is no table tennis instrument that assesses standardized table tennis forehand and backhaand drive techniques (Susanti et al., 2020). The training process and assessment are interrelated so that if in the training process there is no assessment instrument used as the basis for evaluation, the training process is less than optimal. Assessment is a process for making decisions using information obtained through measurement of learning outcomes using both tests and non-tests (I Nyoman Agus Adi Kesuma1, 2021; Moerianto et al., 2021)

Assessment has a broader meaning than measurement, because measurement is actually only a step or action that needs to be taken in the assessment process carried out. Assessment has an understanding of the process of giving or determining value to a particular object based on certain criteria (Setiono, 2023). The main purpose of assessment should be to provide feedback to teachers and students, therefore, determining the grade should be the reason for conducting the assessment (Dewi et al., 2022). The benefit of assessment is to be able to find out how much a person is capable of, and with an assessment it will be easier to carry out an evaluation so that the abilities possessed can be improved and improved (Derbiansyah Farid Varrahman, 2024). The purpose of assessment is to inform decisions about learning experiences and report on what has been achieved (Kurniasih et al., 2021).

For this reason, lecturers must be able to combine the advancement of science and technology and the skills of lecturers in teaching science and technology-based table tennis games (Bimo, 2025), so that researchers try to offer an appropriate technology by visualizing table tennis learning into augmented reality technology so that students are able to enrich and visualize high order thinking skills before they are able to carry out practice. actually this technology is very helpful for teachers in teaching and making creations related to the use of science and technology as a learning media for PJOK.

The learning media used in this study is augmented reality learning media. Augmented reality media makes learning interesting and motivates children to learn. In line with the results of research conducted (Dewi & Faridah, 2022) (Asep Suharta et al., 2024; Nelva Saputra et al., 2020) Augmented Reality as a learning media can be categorized as interactive, interesting and useful. Augmented Reality media is a medium that can be used by teachers to explain subject matter.

Learning media is anything that can be used to channel messages from the sender to the receiver so that it stimulates the thoughts, feelings, attention and interests and willingness of students in such a way that the learning process occurs in order to achieve learning objectives effectively (Dewi et al., 2021; Mustaqim et al., 2017). There are three main levels of learning modes, namely direct experience, pictorial experience, and abstract experience (Dewi, Sitorus Pane, et al., 2023; Dewi, Verawati, et al., 2023). In order for the teaching and learning process to be successful, students should be encouraged to utilize all their sensory organs (Rahmiati, 2021). Learning media can be interpreted as a tool that functions and is useful for channeling learning messages ((Jani et al., 2022; Miftah, 2014) learning media as a tool and material in the learning process. (Swadesi & Kanca, 2018) suggests learning media as everything that can channel messages from a planned source in an effort to create an effective and efficient learning process. So that learning media is an intermediary between educators and students in learning that is able to connect, provide information and provide and distribute messages so as to create an effective and efficient learning process. (Fauzan et al., 2024), The position of the media in the learning system is as a tool, a message channeling tool, a reinforcement tool, and a teacher's representative in conveying information thoroughly, clearly, and interestingly. (Supriadi, n.d.; Supriadi & Dewi, 2022) Learning media occupies a very important position in learning. Learning media results in a communication between educators and students in the learning process. If the learning process does not use the media, the learning process will not occur. This is because the communication between educators and students takes place not optimally. The media becomes an intermediary to create communication, serving to make it easier for educators and students to communicate, so that the teaching and learning process will occur which results in students understanding what the educator gives. When the teaching material has been delivered, the learning outcomes of students become feedback for educators. This feedback is taken into consideration in the next learning process. Learning media as a key point in teachers and students can communicate with each other optimally because learning media is a tool, a channeling tool, a reinforcing tool, and a teacher's representative in conveying information thoroughly, clearly, and interestingly. Thus the position of learning media is a very important means of connecting between one side and the other because it contains information and messages from educators to students.

Augmented reality is a technology that combines two-dimensional or three-dimensional virtual objects and then projects the virtual objects in real time (Abubakar, 2021). Augmented reality is defined as a technology that combines the real world with the virtual world, is interactive in real time, and is in the form of three-dimensional animation (Farhani Isty et al., 2021). Thus Augmented Reality (AR) can be defined as a technology that is able to combine virtual objects in two dimensions or three dimensions into a real environment and then display them or project them in real time.AR is a concept of combining the virtual world with the real world to generate information from data taken from a system on a designated real object so that the boundary between the two becomes increasingly thin. AR can create interaction between the real world and the virtual world, all information can be added so that the information is displayed in real time as if the information becomes interactive and real.

This is in accordance with the results of research conducted by (Agus Kamiana et al., 2019) which states that AR applications for interactive learning for children can be used

for learning. Some previous research related to augmented reality learning media (Evan Savero et al., n.d.; Novia Santi Lilis, 2022; Rahma Dewi et al., 2024; Ramadhan et al., 2023; Yanuardi et al., 2024)

To strengthen the background of the problems that researchers describe, researchers try to conduct preliminary research through a preliminary survey conducted at FIK UNIMED to lecturers who teach table tennis material courses 90% percent of lecturers have not implemented augmented reality-based learning, even lecturers are still wondering what augmented reality is. So from these results, researchers tried to design augmented reality-based table tennis learning.

METHODS

This research uses a quantitative approach with an experimental research type. The research method used is the quasi-experimental method with the research design The Maching Only Pretest-Posttest Control Group Design (Sugiyono, 2010). Where in this design there are two different classes consisting of control and experimental classes. Before doing the learning both were given a pretest of student interest in learning both in the control class and the experimental class. After that, the control class was carried out learning using animal image media while in the experimental class using Augmented Reality media with the same material, namely about animals. Furthermore, after learning both are given a posttest of student learning interest both in the control class and in the experimental class.

In this study, the data collection technique used was a test consisting of a pretest and posttest. The test sheet in this study is an interest scale sheet containing the same statement between the experimental class and the control class. The pretest was given the day before starting the lesson. Completing the pretest sheet. The data source is the entire sample where the entire sample will fill in the interest scale sheet given by giving a checklist mark in the column provided. The list of statements is prepared with alternative answers that have been provided.

RESULTS & DISCUSSION

The pretest results of students' learning interest show that there is a difference between the average value of learning interest. The average of the experimental class (72.34) is greater than the average value of learning interest in the control class (72.04). To determine whether the difference is significant or not, it is necessary to test the difference. Before the difference test is carried out, the prerequisite test is the normality test and the homogeneity test. From the calculation, it was found that the data was normal and homogeneous so that further calculations were carried out with the t-test. Based on the t-test results, it can be seen that the pretest value of learning interest is 0.48 smaller than the t table value at a significant level of 5%. So it can be concluded that there is no difference in the initial ability of experimental and control class students so that this meets the criteria of the matching only pretest-posttest control group design.

The posttest results of student learning interest show differences between the experimental and control classes. The experimental class average of 84.01 is greater than the average value of the control class learning interest of 75.15. The prerequisite test results show that the data of the experimental class and control class are normal and homogeneous so that the para-metric statistical test is carried out, namely the t-test. So it can be concluded that there is a significant difference in student interest in learning between the experimental

class and the control class. The prestest and posttest learning interest tables for the experimental and control classes are as follows.

Table 1. Table of Pretest and Posttest Learning Interest of Experimental and Control Classes

Description	Pretest Learning Interest		Posttest Learning Interest	
	Experiment	Control	Experiment	Control
Highest Score	83	82	92	82
Lowest Score	54	53	61	53
Total Score	1721	1823	1701	1768
Average	72,34	72,04	84,01	75,15
Standard Deviation	8,14	7,26	8,80	8,10
Variance	67,23	54,20	79,24	67,39
X^2 count	4,48	5,28	9,16	7,01
f count	1.25		2,05	
t count	0,48		10,52	

The results of the pretest analysis of elementary students' interest in learning in the experimental class and control class showed that there was no significant difference. So it can be concluded that the initial interest of the two groups was the same before the research was conducted.

After that, treatment was given to the experimental class using learning using Augmented Reality media while the control class was learning using image media. Augmented reality media is able to develop 3D visualization applications so that its application can improve performance. After being given the next treatment students were given a posttest sheet of student interest in learning. The results of the posttest of student learning interest in the experimental class (84.01) and in the control class (75.15) show that there is a significant difference between the experimental class and the control class. The difference in the results of students' interest in learning at the end of learning in this study is likely due to the provision of different treatments. In addition, other treatments that might affect learning interest such as subject matter and learning models are made the same. It can be concluded that learning using Augmented Reality as a learning medium can affect student interest in learning. The effect is positive because the learning interest of students who use AR is higher than the learning interest of students who only use image media. Augmented Reality has a positive influence on table tennis learning because during learning students become interested in observing the basic techniques of table tennis that appear on the screen. That means this application provokes students to behave scientifically such as the emergence of curiosity, confidence, objectivity to facts and honesty (Wahyudi & Arwansyah, 2019). Indirectly this media also facilitates students to observe the basic techniques of table tennis. After observing the images that appear then students write the results on the sheet provided. At the end of learning, the results showed that interest in the experimental class was high, it means that Augmented Reality media had a positive influence. The positive effect of Augmented Reality on student interest in learning is because this media is interesting and interactive (Sudarmilah et al., 2019). Augmented Reality is an interactive media that involves student activeness to interact when participating in learning so that it helps students in seeking experience and knowledge.

Interest is a strong tendency or interest in a particular activity, topic, or subject. It is an internal drive that encourages a person to explore, learn, and actively engage in things they like or enjoy (Setiawan et al., 2016). Interests can vary from individual to individual, and are often influenced by one's experiences, environment and natural aptitude. Interests can also change over time with exploration and new experiences. One may discover new interests or develop deeper interests in areas they had not previously considered. This

demonstrates the flexibility and dynamism of one's interests. It is important for educators and parents to recognize and support the interests of their children and students.

By developing positive interests, individuals can find personal fulfillment, improve mental well-being and reach their full potential in various aspects of life. Interest in learning is an intrinsic attraction that motivates individuals to seek knowledge, explore information and actively engage in the learning process. It is a fire that burns within a person that drives them to explore a particular topic, concept or skill with enthusiasm and perseverance. When someone has a strong interest in learning a subject, they tend to be more engaged in learning, more eager to complete tasks, and more diligent in exploring the material. The importance of learning interest in education cannot be underestimated. Teachers who understand their students' learning interests can design learning experiences that are interesting and relevant, generating a sustained passion for learning. Conversely, when learning interests are ignored or inhibited, students are likely to feel bored, frustrated or even lose interest in the learning process.

Therefore, in order to improve educational effectiveness, it is important to identify students' learning interests and create a learning environment that stimulates and supports these interests. Thus, interest in learning is not only the key to academic success, but also the foundation for continuous personal and professional growth (Abdi et al., 2020; Nazirun et al., 2019). If students have an interest in learning, they will take learning seriously and enjoy every lesson. In addition, students will also participate in learning with enthusiasm and without coercion from teachers or family. Indicators of interest in learning according to (Aldo Bonar Simbolon, 2022) namely (1) having a sense of pleasure, (2) having an attraction, (3) paying attention to something, (4) being involved in every lesson, (5) diligently studying and doing the assignments given, (6) being diligent and always disciplined in learning, and (7) always making a study schedule. Meanwhile, according to (Nofulan Adyani*, 2021) indicators of interest in learning are (1) a sense of pleasure, (2) student interest in learning, (3) student attention in learning, and (4) students are involved in learning.

Interest is an encouragement in a person or a factor that creates interest or attention effectively (Miftahuddin1, 2021). Augmented Reality can make students interested in this learning, which means that it can foster students' interest in learning. In addition, during learning students enthusiastically follow the learning process. Students who are enthusiastic about learning mean that they are interested in learning. This is in line with (Anjani et al., 2022) Students who are interested in learning will follow the learning process with a sense of pleasure, which means that it can foster student interest in learning. This research has specific limitations which tend to only use one research location, namely the Faculty of Sports Science UNIMED. And this study only wants to see how the effect of augmented reality as a learning media on student interest in learning, especially in table tennis.

This research has a clear novelty, namely the effect of the application of Augmented Reality technology for 3D visualization of UNIMED's Faculty of Sports Science students who are more focused on student interest in learning, especially in table tennis. One of the main differentiators from previous research is that this research has a significant effect on students' interest in learning table tennis. Through this approach, it is hoped that students can increase their desire and motivation for the game of table tennis and be able to provide a more immersive experience for prospective new students in the future while expanding the promotional reach of the University in the future.

CONCLUSION

Based on the t-test results, it can be seen that the pretest value of learning interest is 0.48 smaller than the t table value at a significant level of 5%. So it can be concluded that there is no difference in the initial ability of experimental and control class students. The prerequisite test results show that the experimental and control class data are normal and homogeneous so that the para-metric statistical test is carried out, namely the t-test. So it can be concluded that there is a significant difference in student learning interest between the experimental class and the control class.

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