

The Effectiveness of Multimedia Interactive Model on Pencak Silat Basic Motion Learning

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ABSTRACT

Technology-based interactive learning models have become extensively utilised as educational tools. The presence of it creates a unique educational environment. The objective of this study was to assess the efficacy of interactive multimedia in enhancing the fundamental pencak silat motor skills of junior high school students in Palembang City. This study employed a quasi-experimental research design, specifically utilising a one-group pre-test and post-test experimental design. The research sample consisted of 80 junior high school students in Palembang City. The data was gathered by paperwork obtained from fundamental pencak silat movement assessments. The test data underwent normality testing using both the Kolmogorov-Smirnov test and the Shapiro-Wilk test. The data analysis technique employed a two-sample paired t-test to determine the average. The Independent Samples Test yielded a t-value of 3.085 and a p-value of $0.000 < 0.05$, indicating that the null hypothesis (H_0) can be rejected. Hence, it can be inferred that the interactive multimedia model positively impacts the enhancement of fundamental motor skills in junior high school pupils practicing pencak silat. The consequences of this research pertain to the necessity for physical education teachers in schools to possess innovative skills, specifically in using digital applications as educational tools.

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1. INTRODUCTION

The progress in science and technology has significantly impacted human life and has also influenced the incorporation of education, particularly in classroom learning activities. Educators are required to implement imaginative and groundbreaking instructional exercises. For instance, the teaching of physical education in junior high schools still necessitates ingenuity in the utilisation of instructional materials. Based on the findings of observations and group discussions with sports subject teachers in a preliminary study conducted in 15 junior high schools in Palembang city, it was determined that there is a lack of appropriate utilisation of educational resources pertaining to the integration of technology in sports activities. Instead, the learning process primarily relies on the use of mandatory sports equipment and teacher-led lectures to explain movement in sports-related learning activities. The teaching of basic movement activities in pencak silat encountered several obstacles,

including: 1) inadequate explanation and examples provided by the teacher, leading to students' lack of understanding, 2) absence of diverse and sufficient learning materials, 3) limited availability of learning resources, and 4) insufficient time allocated for learning.

From the results of these observations and discussions, it was agreed that there was a need for interactive learning media that should be tested in learning basic *pencak silat* movements. Several previous studies have shown that there is quite a significant influence on sports learning using interactive learning media. Moreover, with the characteristics of different age levels of school students, the existence of media containing text, images, videos and audiovisuals in the form of interactive multimedia can provide a fun learning atmosphere (Galan et al., 2020; Miyawaki et al., 2019; Mutlu-Bayraktar, 2019; Nguyen et al., 2020). In sports learning activities, multimedia can be used as a medium for practical activities and for improving movement skills (Iqbal et al., 2019; Leser et al., 2011). Physical activities such as *pencak silat* become fun through interactive multimedia (Lestari & Lanos, 2020).

Moreover, the movements of *pencak silat* have unique movements, and close attention must be paid to movement techniques (Nugroho, 2020). The martial art of *pencak silat* is also a method of fighting that philosophically teaches physical and spiritual education so that it helps its connoisseurs live up to the noble moral values in their society. Pencak silat norms are conceptually found in performance attitudes, steps, attacks and protection (defence) (Ediyono & Widodo, 2019; Latiff, 2012). Other research shows that the Macromedia Flash 8 application is a practical and effective interactive multimedia learning medium used as a Pencak Silat learning medium (Ihsan & Valentino, 2019). Thus, learning *pencak silat* as a martial art and sport in the global era must be taught using fun learning and involving technology.

Nowadays, it has become a trend to design learning models using technology (Anglin & Ley, 2002). Technology and sport cannot be separated because of the integration of multidisciplinary knowledge (Subic et al., 2011). Some use multimedia blogging in physical learning (Papastergiou et al., 2011). Thus, the use of technology in education is not a form of modern pedagogy that is newly designed to achieve educational goals (Daniaa et al., 2011). Therefore, this research examines the effectiveness of using interactive multimedia for learning *Pencak silat* in junior high schools. The use of interactive multimedia is unique because it is a learning media model that researchers have previously developed but has not been tested widely in schools. They have developed system changes using the internet and artificial intelligence technology as a form of educational innovation for the implementation of sports education (Sun, 2021).

Therefore, this research aims to determine the effectiveness of interactive multimedia on the basic *pencak silat* movement abilities of students in junior high schools in Palembang City. The results of this study are expected to contribute to the development of interactive multimedia that has been previously researched so that its use in a wider school can be used as material for improvement and updating of the model that has been made.

2. METHODS

This study used a quasi-experimental research methodology, specifically utilising a one-group pre-test and post-test experimental design. The research design included a one-group pre-test and post-test design, where a pre-test was administered prior to treatment and a post-test was conducted following treatment administration (Creswell, J.W., Clark, 2017). This study delves into the impact of interactive multimedia on the acquisition of fundamental motions in *pencak silat* among junior high school students. The research sample consisted of 80 junior high school students in Palembang City. Study activities are conducted in accordance with the class curriculum to ensure that students remain unaware of their role as study participants. This is done in order to attain more precise outcomes from the research data. The study was conducted from February to July 2023. The treatment method consisted of 14 sessions, during which the students underwent a pre-test before receiving the treatment and a post-test following the treatment. The data was gathered through the utilisation of paperwork obtained from fundamental *pencak silat* movement examinations. The test data underwent normality

testing using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The data analysis technique employs a two-sample paired t-test to determine the mean.

3. FINDINGS AND DISCUSSION

3.1 Finding

3.3.1 Test of Normality Result

The test data obtained was tested for normality and it was concluded that the research data was normal, as presented in the following table.

Table 1. Tests of Normality Data^{b,c}

Class	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Test Result Post-test Experiment	.150	40	.023	.949	40	.069
Post-test Control	.146	40	.031	.925	40	.011

a. Lilliefors Significance Correction

b. Test result is constant if Class = Pre-test Experiment. It has been omitted.

c. Test result is constant if class = Pre-test control. It has been omitted.

Table 1 shows that the overall test result data is normally distributed. The test data results for both the Kolmogorov-Smirnov test and the Shapiro-Wilk test are >0.05 . Thus it can be concluded that the data has a good level of confidence and can be continued to be tested at the next test stage.

Table 2. Group Statistics of Test Data

Class	N	Mean	Std. Deviation	Std. Error Mean
Test- Result Post-test for Experiment Class	40	85.42	5.189	.821
Post-test for Control Test	40	40.94	7.571	1.197

Based on the output results in the group statistics above, it can be seen that the average results of the basic movements of *pencak silat* in the post-test group of the experimental class obtained a value of 85.42 and a standard deviation of 5.189, while the average results of the basic movements of *pencak silat* in the class group control obtained a value of 40.94 and a standard deviation of 7.571. The following are the results of the t-test values of the experimental group post-test and the control group post-test.

Tale 3. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
Test-Result		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Test-Result	Equal variances assumed	3.085	.083	30.647	78	.000	44.480	1.451	41.590	47.369
	Equal variances not assumed			30.647	69.017	.000	44.480	1.451	41.584	47.375

In the Independent Samples Test, output results were obtained by the value of $t = 3.085$ and the value of Sig. (2-tailed) or $p\text{-value} = 0.000 < 0.05$ or H_0 is rejected. Thus, there is the influence of interactive multimedia models that have a good effect on improving the basic movement skills of *pencak silat* in junior high school students. So, it can be said that interactive multimedia has a significant influence on students' basic *pencak silat* movement abilities. From the results of observations during the experiment, students also seemed happy and motivated to pay attention to the teacher's explanation of the basic movements of *Pencak silat*.

The results of the gain score test show how to calculate the difference between the post-test scores of the control group and the experimental group, and the description of the ideal score is the maximum value that can be obtained. The following are the results of the gain score:

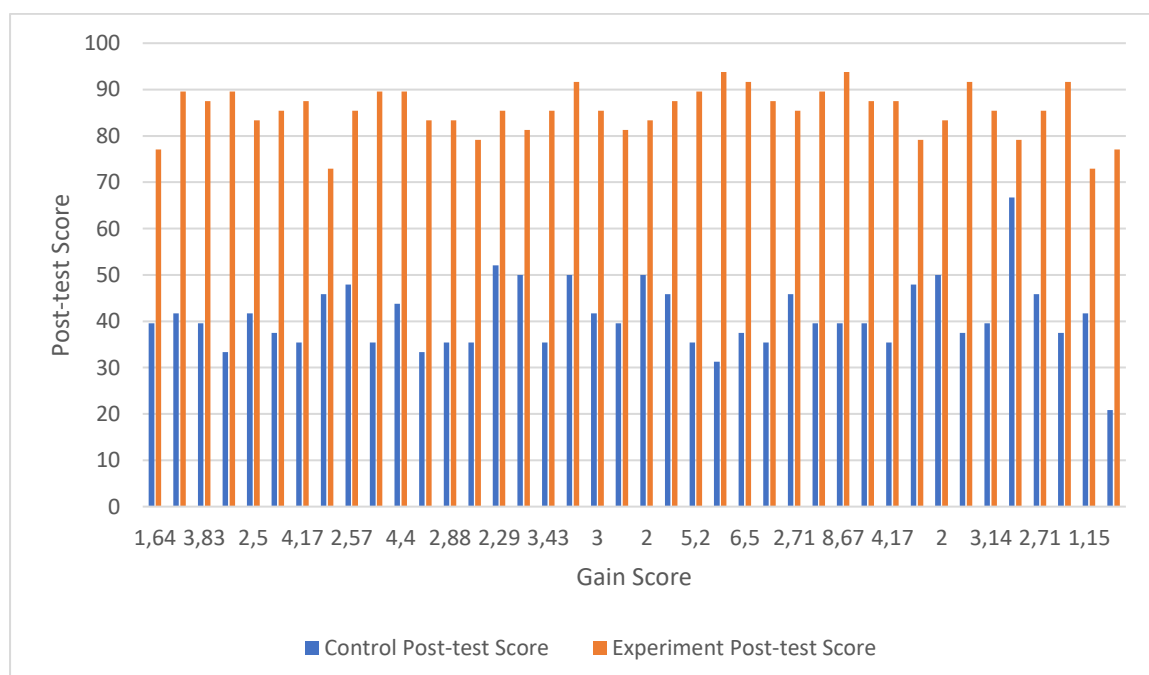


Figure 1. The results of the Post-test Gain Scores for the Control and Experimental Groups

Based on the results of the N-gain score shown in Figure 1 concluded that the average value of the N-gain score for the experimental class (learning the basic movements of *pencak silat* using interactive multimedia) obtained a value of 93.75% and is included in the "high" category, with an N-gain value. The minimum score is 72.92% and the maximum N-gain score is 100%. Meanwhile, the average N-gain score for the control class (conventional learning model) was 66.67%, included in the "medium" category, with a minimum N-gain score value of 20.83% and a maximum N-gain score value of 100%. So, it can be concluded that interactive multimedia in learning basic *pencak silat* movements is more meaningful and has a good impact on changes in students' abilities.

3.2 Discussion

The results of these findings provide an in-depth understanding that the era of the use of technology in learning activities in the classroom helps the learning atmosphere to be more enjoyable and can have an impact on improving the learning outcomes of students' basic movements of *Pencak silat*. So, physical activities such as *pencak silat* are carried out in a fun way through interactive multimedia models (Lestari, El, & Lanos, 2020). Moreover, students in junior high school have different characteristics from those at the tertiary level. Therefore, teachers must be able to pay attention to the use of learning media according to the level of needs and character of students in junior high schools. Moreover, students also have different experiences, knowledge and skills. The results of this research are also considered for schools to support teachers in developing interactive multimedia for each subject and providing appropriate learning facilities or tools that teachers need so that learning can achieve learning goals. So, interactive multimedia can also produce uniformity of observation through learning using computers with previously designed technology.

This research also shows that the interactive multimedia model used has been adapted to the age level and characteristics of students in junior high schools. This means that learning design must pay attention to the age level and needs of children (Burns, Fu, Fang, Hannon, & Brusseau, 2017a; Burns, Fu, Hannon, & Brusseau, 2017; Fu, Burns, Brusseau, & Hannon, 2016; Galan et al., 2020), and genders (Miyawaki et al., 2019). Therefore, teacher experience provides innovation in the design of physical activities (Fernández-Rivas & Espada-Mateos, 2019). However, this must go through an analysis of the required multimedia needs before being implemented in class or developed (Suhairi, Tangkudung, & Asmawi, 2020). Thus, these findings provide an overview of increasing the learning motivation of *pencak silat* students through the provision of interactive learning media. This means that an interactive learning process does not only rely on good communication methods and generating consistent feedback. However, the learning media used also provides an interactive communication process between students and the learning media (multimedia technology). The learning process not only creates two-way communication between students and teachers, but also students can carry out interactive communication with the content and learning media used so that learning objectives are achieved.

Therefore, school sports and physical health education teachers can combine technology with multimedia technology integrated with Information and Communication Technology (ICT) (Li & Lu, 2020; Zhang & Lei, 2012; Lai, 2008). Technology must be specifically designed as an effective learning resource (Wiksten, Spanjer, & LaMaster, 2002). In sports, multimedia can be used as a medium for practical activities such as motor skills (Leser, Baca, & Uhlig, 2011; Iqbal et al., 2019). Thus, technology has revolutionized education and is used to create healthy learning habits (Toto & Strazzeri, 2019) or a new revolution in sports education (Tang, 2011). Thus, this research has provided opportunities for teachers to create interactive multimedia as learning media and innovate through technological developments. Students can also use their smartphones to access learning materials outside of class. This can also have an impact on increasing students' understanding of the teaching materials explained in class. Students can continue to study it repeatedly at home, even before student study in class, they can first read the teaching materials that will be studied in class so they can understand what the teacher is explaining.

4. CONCLUSION

From the results of the data analysis, it can be concluded that the interactive multimedia model has a good influence on improving the basic movement skills of *pencak silat* in junior high school students. This can be seen from the presentation of the data in the table, which is quite good and meets the criteria. Students are also happy to see the teacher's presentation which is equipped with a video so they can easily understand the basic movements of *pencak silat*. The implications of this research are related to the innovation that teachers of physical education subjects in schools must have, who must consider the use of technology applications as learning media. Apart from that, the research results can also be used as a form of consideration for building collaboration between teachers from different scientific fields (information technology) in schools in developing interactive multimedia as a learning medium for various subjects. This research is still limited to the use of interactive multimedia displayed in class and has not utilized technological applications so that students have not been directed to access teaching materials outside the classroom. Thus, future researchers can examine more deeply related to students' activeness in accessing multimedia technology model applications outside the classroom. Teachers can apply and prepare interactive multimedia-based learning materials for other sports movement activities.

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