

## PAPER

# The Effect of Modeling Learning, Audio-Visual Media, and Intellectuals on Pencak Silat Learning Outcomes

Heri Wahyudi<sup>1</sup>(✉), Awang Firmansyah<sup>1</sup>, Ilham<sup>2</sup>, Deby Tri Mario<sup>2</sup>, Anton Komaini<sup>2</sup>, Novadri Ayubi<sup>1</sup>

<sup>1</sup>Universitas Negeri Surabaya, Surabaya, Indonesia

<sup>2</sup>Universitas Negeri Padang, Padang, Indonesia

[heriwahyudi@unesa.ac.id](mailto:heriwahyudi@unesa.ac.id)

## ABSTRACT

This study analyzed the influence of modeling learning, audio-visual media, and intellectuals on pencak silat learning outcomes. The study employed an experimental approach with a  $2 \times 2$  factorial design. It involved 40 university students who were enrolled in the sports science program. The study began with the preparation of the study administration. After that, subjects were put into two major groups based on their intellectual test scores. Based on the median, 10 people were taken at the top of the median, and the other 10 people were taken at the bottom of the median. Every 10 subjects were divided again into two smaller groups to create four small groups of five people in each group. Then, these groups were put into cells by drawing lots. The first major group contained two smaller groups of subjects with high and low intellectual abilities. These groups were given modeling lessons. Similarly, the second major group comprised subjects with high and low intellectual abilities. Only these subjects were given audio-visual media learning. The collected data were analyzed using descriptive statistics. All data from this study was processed using the SPSS application. To determine differences in pencak silat learning outcomes in each group, the data obtained from the test and measurement results were analyzed using ANOVA. The results reported that modeling learning and the use of audio-visual media make a difference in pencak silat learning outcomes for students with high and low intellectual abilities. This study also noted that direct learning modeling provides better results than using audio-visual media. This is because when using modeling learning, students can immediately observe and practice what is demonstrated by a model, so the material and practice can be immediately accepted.

## KEYWORDS

modeling learning, audio-visual media, education, pencak silat

## 1 INTRODUCTION

Learning is a complex process that happens throughout life [1]. The learning process occurs because of the interaction between a person and his environment [2].

Wahyudi, H., Firmansyah, A., Ilham, Mario, D.T., Komaini, A., Ayubi, N. (2024). The Effect of Modeling Learning, Audio-Visual Media, and Intellectuals on Pencak Silat Learning Outcomes. *International Journal of Interactive Mobile Technologies (iJIM)*, 18(15), pp. 160–168. <https://doi.org/10.3991/ijim.v18i15.50501>

Article submitted 2024-05-03. Revision uploaded 2024-06-13. Final acceptance 2024-06-14.

© 2024 by the authors of this article. Published under CC-BY.

Therefore, learning can occur anywhere and at any time [3]. One sign that someone has learned is a change in their behavior, which may be caused by changes in their level of knowledge, skills, or attitudes [4].

Teaching and learning activities that rely on human elements' interactions are processes to achieve teaching objectives [5]. Thus, teachers try to organize the learning environment and make students enthusiastic about their learning activities [2]. A set of theories and experiences helps the teacher prepare teaching programs appropriately and systematically [6]. Besides that, a teacher must have and understand the teaching models that will be implemented in their teaching [7]. Moreover, teachers have abundant sources of teaching models that can be chosen for teaching activities. These models include modeling learning and learning with media in the form of audio media and visual media [8].

With plenty of options, a teacher needs to think of strategies to help students learn certain concepts, skills, and information [8]. Interestingly, the learning process can be more dynamic and achieve the desired targets if other tools or media are added, such as audio-visual media, print, projectors, films, games, and so on [8]. The use of learning media in the teaching and learning process can ignite new desires and interests, generate motivation, and stimulate learning activities. They can even have a psychological influence on students [9].

For this reason, it is necessary to investigate the importance of various media in improving the teaching and learning process. In this study, the learning process is specified for pencak silat learning because this subject is taught at the Surabaya State University in Indonesia. Currently, there is still a lack of learning strategies or media that can provide a solid or adequate learning experience in pencak silat. In practice, the teaching of pencak silat is divided into two types, namely, the lecture method and direct practice. In the lecture method, it turns out that students are not quick enough to master the pencak silat movements given by the lecturer. Consequently, the material has to be repeated several times, making the learning less effective. This study believes that adding modeling learning and audio-visual media might improve this learning. Therefore, the study aims to analyze the influence of modeling learning and audio-visual media on pencak silat learning outcomes.

## **2 MATERIALS AND METHODS**

### **2.1 Study design**

This study employed an experimental method involving a  $2 \times 2$  factorial design. It had two independent variables: the learning model and intellectual ability. The learning model consisted of direct learning (modeling) and audio-visual media learning. Meanwhile, intellectual abilities consisted of high and low intellectual abilities. The dependent variable in this study was the results of learning pencak silat.

### **2.2 Subjects**

The study invited 40 university students to participate in it. They studied in the sports science study program.

### 2.3 Procedure

This study was conducted in several stages. First, we prepared study administration, such as study permits from in-charge stakeholders. After that, subjects were selected to be the study sample. The participants were grouped based on the results of their intellectual test scores, high and low.

1. Based on the median, 10 people are at the top of the median. A similar action was taken against the other 10 people at the bottom of the median. This process generated two major groups.
2. Each major group was divided again into two groups to create four smaller groups of five people in each group. These small groups were put into cells by drawing lots.
3. The first major group contained subjects with high and low intellectual abilities. These subjects were given direct learning (modeling).
4. The second major group consisted of those with high and low intellectual abilities. Differently, they were given audio-visual media learning.

To obtain data on students' intellectual ability, this study used a general ability test, which can determine the IQ of each individual. In particular, the test used standard progressive matrices, looking at the quality of an individual's intelligence. When the test scores were obtained, the scores were classified according to the norms for the psychological test, as shown in Table 1.

**Table 1.** Psychological test norms

Score	Category
>55	Very good
50–55	Good
37–49	Enough
23–36	Not enough
<23	Very poor

In this study, data collection was carried out for two months. The test focused on examining pencak silat movements (step pattern movements, punching and parrying movements, kicking and parrying movements, and falling and throwing movements). The tests were assessed by three pencak silat experts. The assessment criteria are described in Table 2.

**Table 2.** Pencak silat assessment criteria

Score	Category
90–100	Very good
80–89	Good
70–79	Enough
60–69	Currently
50–59	Not enough
<49	Very poor

## 2.4 Statistical analysis

The collected data was analyzed using descriptive statistics. All data from this study was processed using the SPSS application. To determine differences in pencak silat learning outcomes in each group, the data obtained from test results and measurements were analyzed using ANOVA.

## 3 RESULTS

This section provides the test results of several tests across different groups. The first and second parts exhibit data on modeling learning in high- and low-intellectual groups. Meanwhile, the third and fourth parts present the results of audio-visual media in both groups. The final part compares these groups and provides differences among the groups.

### The value of pencak silat modeling group for high-intellectual students

**Table 3.** Description of the modeling group's pencak silat scores for students with high intellectual abilities

No	Movements				Average
	Step Pattern	Punching and Parrying	Kicking and Parrying	Dropping and Slamming	
1	77.6	75.3	76.6	77.3	76.7
2	78.6	74.6	71.3	75	74.9
3	71.3	78.3	74.6	75.3	74.9
4	85	83.3	88	88.3	86.2
5	76.6	77.3	77	79	77.5
$\bar{X}$	77.82	77.76	77.5	78.98	78.015
SD	4.90	3.44	6.29	5.46	4.69

### The pencak silat value of the modeling group for low-intellectual students

**Table 4.** Description of the modeling group's pencak silat scores for students with low intellectual abilities

No	Movement				Average
	Step Pattern	Punching and Parrying	Kicking and Parrying	Dropping and Slamming	
1	60	63.3	62.3	61.6	61.8
2	68.8	67.6	68	64.6	67.3
3	66.3	65.6	68.6	66.3	66.7
4	66	60	63.6	65.3	63.7
5	66.3	71.3	71	72.3	70.2
$\bar{X}$	65.48	65.56	66.7	66.02	65.94
SD	3.27	4.28	3.63	3.92	3.27

**The value of audio visual group pencak silat for highly intellectual students**

**Table 5.** Description of the value of audio-visual group pencak silat for students with high intellectual abilities

No	Movement				Average
	Step Pattern	Punching and Parrying	Kicking and Parrying	Dropping and Slamming	
1	73.3	73	73.6	75.3	73.8
2	73.6	73	73.3	71.6	72.9
3	67.6	78	70	73	72.2
4	67.6	78	70	73	72.2
5	66.3	60	63.3	62.6	63.1
$\bar{X}$	69.68	72.4	70.04	71.1	70.805
SD	3.48	7.37	4.15	4.93	4.39

**The value of pencak silat audio visual group for low intellectual students**

**Table 6.** Description of the value of audio-visual group pencak silat for students with low intelligence

No	Movement				Average
	Step Pattern	Punching and Parrying	Kicking and Parrying	Dropping and Slamming	
1	61.6	60	63.3	60	61.2
2	71.3	66.3	71.6	70	69.8
3	61.6	60	63.3	60	61.2
4	66	60	62	60	62.0
5	60	60	66.3	60	61.6
$\bar{X}$	64.1	61.26	65.3	62	63.17
SD	4.60	2.82	3.86	4.47	3.72

**Table 7.** Normality test results

Group	P-Value
Modeling and high intelligence	0.589
Modeling and low intelligence	0.993
Audio-visual and high intellectual	0.335
Low audio-visual and intellectual	0.335

Notes:  $P > 0.05$  = Data is normally distributed,  $P < 0.05$  = Data is not normally distributed.

The results of pencak silat scores between the modeling and audio-visual groups for students with low intellectual and high intellectual abilities are presented in Figure 1.

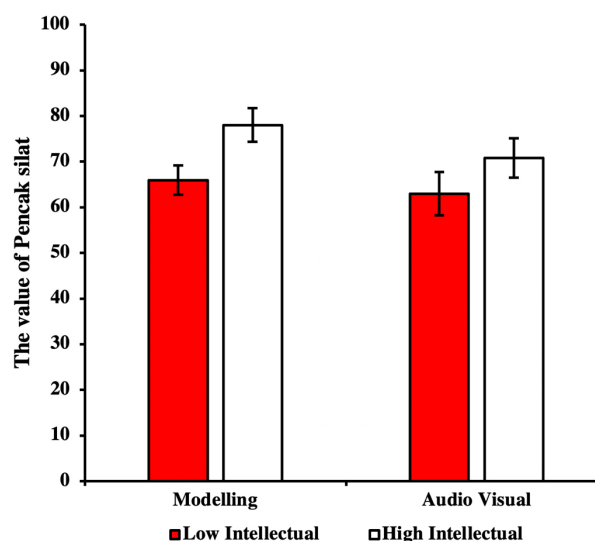


Fig. 1. Pencak silat scores between modeling and audio-visual groups for students with low intellectual and high intellectual

Table 8. Results of difference

Data	P
Modeling and audio-visuals in students with low intelligence	0.245
Modeling and audio-visuals for students with high intellectual abilities	0.037*
Modeling and students with high and low intelligence	0.001*
Audio-visual and for students with high and low intelligence	0.017

## 4 DISCUSSION

This study analyzed the effect of modeling learning and audio-visual media on Pencak Silat learning outcomes. A learning model is essentially a system designed to facilitate students learning [10]. An educator should think that learning models given to students can be effectively implemented by paying attention to various factors that have the potential for student success or failure [11]. One factor that also plays a role in the success of the learning process is the non-physical aspect in the form of intellectual ability or intelligence [12].

Learning pencak silat requires dexterity, concentration, and astuteness. Besides, it also needs appropriate learning models that can be used to make learning effective and efficient [13]. As in this study, the learning model used is modeling learning and audio-visual media. Apart from learning models, what also plays a role in the success of the learning process is the intellectual level or intelligence possessed by each individual [12].

The results of this study reported that modeling learning and audio-visual media make a difference in pencak silat learning outcomes. However, the use of direct modeling learning provides better results than audio-visual media. One of the reasons might be that modeling learning allows students to immediately see and practice what is demonstrated by a model. Hence, the material and practice can be immediately accepted. This is confirmed by a study reporting the effect of direct learning models in teaching. The study found that the model increases the

completion of simple and complex skills and declarative knowledge that can be clearly defined and taught step by step [14]. Meanwhile, the influence of using audio-visual media on pencak silat learning outcomes was lower. The reason is probably because audio-visual media tend to provide only auditory and visual input. Apart from that, these media cannot be used as a learning model but as an aid in learning to increase student motivation to participate in pencak silat learning. As a result, the atmosphere is unwatchable and boring. This is also reinforced by the study, which reports that the main function of learning media is as a teaching aid that also influences the climate, conditions, and learning environment organized and created by the teacher [15].

Another interesting finding in this study was regarding learning outcomes in the use of modeling learning and audio-visual media for students with low intellectual abilities. This study showed no difference among these students, perhaps because of the influence of intellectualism and low absorption capacity. Thus, implementing learning models, either direct learning models or audio-visual media, does not influence or improve learning outcomes. Furthermore, this study also reported that an individual's intellectual ability or intelligence determined the success of learning outcomes. Individuals with a high level of intellectual ability have higher learning outcomes than those with low intellectual abilities. This finding confirms earlier studies that emphasize intelligence as an important factor that determines a person's success or failure in learning [16].

Despite the compelling results, this study has some limitations. First, it did not provide information about the students' initial abilities in pencak silat, whether each student already has basic pencak silat skills or not. In fact, this information might influence pencak silat's learning outcomes. Apart from that, researchers have not been able to determine other factors caused by changes in physical conditions, such as fatigue, concentration, and mental or emotional states, that can affect learning outcomes.

## 5 CONCLUSION

This study concludes that modeling learning and audio-visual media make a difference to the pencak silat learning outcomes for students with high and low intellectual abilities. However, it is important to note that direct learning modeling provides better results than audio-visual media. One of the reasons is that modeling learning allows students to immediately see and practice what is presented by a model. Therefore, the material and practice can be immediately absorbed.

## 6 CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

## 7 REFERENCES

- [1] M. Mlambo, M. Silén, and C. McGrath, "Lifelong learning and nurses' continuing professional development, a metasynthesis of the literature," *BMC Nursing*, vol. 20, 2021. <https://doi.org/10.1186/s12912-021-00579-2>
- [2] E. Stern, "Individual differences in the learning potential of human beings," *NPJ Sci Learn*. vol. 12, 2017. <https://doi.org/10.1038/s41539-016-0003-0>

- [3] S. Sophonhiranrak, "Features, barriers, and influencing factors of mobile learning in higher education: A systematic review," *Heliyon*, vol. 7, no. 4, 2021. <https://doi.org/10.1016/j.heliyon.2021.e06696>
- [4] J. Meis and Y. Kashima, "Signage as a tool for behavioral change: Direct and indirect routes to understanding the meaning of a sign," *PLoS One*, vol. 12, no. 8, pp. 1–16, 2017. <https://doi.org/10.1371/journal.pone.0182975>
- [5] J. Maya and J. Maraver, "Teaching-learning processes: Application of educational psychodrama in the university setting," *Int. J. Environ. Res. Public Health*, vol. 17, no. 11, p. 3922, 2020. <https://doi.org/10.3390/ijerph17113922>
- [6] A. R. Artino and A. Konopasky, "The practical value of educational theory for learning and teaching in graduate medical education," *J. Grad. Med. Educ.*, vol. 10, no. 6, pp. 609–613, 2018. <https://doi.org/10.4300/JGME-D-18-00825.1>
- [7] L. T. Nguyen *et al.*, "How teachers manage their classroom in the digital learning environment – experiences from the university smart learning project," *Heliyon*, vol. 8, no. 10, p. e10817, 2022. <https://doi.org/10.1016/j.heliyon.2022.e10817>
- [8] L. C. Huang and C. Y. Hung, "Effects of multimedia audio and video integrated orientation training on employees' organizational identification and self-efficacy promotion," *Front. Psychol.*, vol. 13, 2022. <https://doi.org/10.3389/fpsyg.2022.803330>
- [9] X. Sun, R. Fu, G. Zhang, and C. Chen, "Effects of multimedia integrated fine arts education on students learning attitude and learning satisfaction," *Front. Psychol.*, vol. 13, 2022. <https://doi.org/10.3389/fpsyg.2022.907468>
- [10] T. Jeyakumar *et al.*, "An education framework for effective implementation of a health information system: Scoping review," *J. Med. Internet Res.*, vol. 23, no. 2, p. e24691, 2021. <https://doi.org/10.2196/24691>
- [11] Y. Chu, C. Chen, G. Wang, and F. Su, "The effect of education model in physical education on student learning behavior," *Front. Psychol.*, vol. 13, 2022. <https://doi.org/10.3389/fpsyg.2022.944507>
- [12] J. A. Mangels, B. Butterfield, J. Lamb, C. Good, and C. S. Dweck, "Why do beliefs about intelligence influence learning success? A social cognitive neuroscience model," *Soc. Cogn. Affect. Neurosci.*, vol. 1, no. 2, pp. 75–86, 2006. <https://doi.org/10.1093/scan/nsl013>
- [13] R. I. Doewes, G. Elumalai, and S. H. Azmi, "Biomechanics analysis on Jejak kick of pencak silat," *J. Popul. Ther. Clin. Pharmacol*, vol. 29, no. 4, pp. e116–e125, 2022. <https://doi.org/10.47750/jptcp.2022.989>
- [14] P. López, M. Torrance, G. Rijlaarsdam, and R. Fidalgo, "Effects of direct instruction and strategy modeling on upper-primary students' writing development," *Front. Psychol.*, vol. 8, 2017. <https://doi.org/10.3389/fpsyg.2017.01054>
- [15] M. D. Abdulrahaman *et al.*, "Multimedia tools in the teaching and learning processes: A systematic review," *Heliyon*, vol. 6, no. 11, 2020. <https://doi.org/10.1016/j.heliyon.2020.e05312>
- [16] P. L. Ackerman, "Intelligence process vs. Content and academic performance: A trip through a house of mirrors," *J. Intell.*, vol. 10, no. 4, p. 128, 2022. <https://doi.org/10.3390/jintelligence10040128>

## 8 AUTHORS

**Heri Wahyudi** is a lecturer at the Faculty of Sports and Health Sciences, Universitas Negeri Surabaya, Indonesia and has research interest in the field of Sports Science (E-mail: [heriwahyudi@unesa.ac.id](mailto:heriwahyudi@unesa.ac.id)).

**Awang Firmansyah** is a lecturer at the Faculty of Sports and Health Sciences, Universitas Negeri Surabaya, Indonesia and has research interest in the field of sports Science (E-mail: [awangfirmansyah@unesa.ac.id](mailto:awangfirmansyah@unesa.ac.id)).

**Ilham** is a lecturer at the Faculty of Sports Sciences, Universitas Negeri Padang, Indonesia and has research interest in strength and conditioning (E-mail: [ilhamf@fik.unp.ac.id](mailto:ilhamf@fik.unp.ac.id)).

**Deby Tri Mario** is a lecturer at the Faculty of Sports Sciences, Universitas Negeri Padang, Indonesia and has research interest in the field of sports Science (E-mail: [debytrimario@unp.ac.id](mailto:debytrimario@unp.ac.id)).

**Anton Komaini** is a lecturer at the Faculty of Sports Sciences, Universitas Negeri Padang, Indonesia and has research interest in the field of motor skills (E-mail: [antonkomaini@fik.unp.ac.id](mailto:antonkomaini@fik.unp.ac.id)).

**Novadri Ayubi** is a lecturer at the Faculty of Sports and Health Sciences, Universitas Negeri Surabaya, Indonesia and has research interest in the field of exercise physiology (E-mail: [novadriayubi@unesa.ac.id](mailto:novadriayubi@unesa.ac.id)).