



# Effectiveness of Audio-Visual Media and Aid-Based Swimming Learning Model on Freestyle Swimming Learning Outcomes

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## ABSTRACT

This research aimed to examine the effectiveness of a swimming learning model on the ability of school student freestyle swimming skill. The method used in this study was the quantitative weak-experimental one group pre-test post-test design. The research sample was selected by using cluster random sampling with a total of 33 students. The student knowledge was measured by using a written test in the form of multiple choices. The skills were measured by using a 25m freestyle swimming test assessed by 3 licensed swimming observers. The results of the study showed that there was an influence of audio-visual media and aids on freestyle swimming learning outcomes in the knowledge ( $t = 10.094$ ,  $p = 0.000 < 0.05$ ) and skill ( $t = 7.742$ ,  $p = 0.000 < 0.05$ ) aspects. The knowledge aspect increased by 52.82%, while the skill aspect increased by 32.57%. It concludes that audio-visual media and swimming aids could influence freestyle swimming learning outcomes with a moderate range of influence.

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## INTRODUCTION

In its implementation, physical activity is used as a vehicle for student learning experiences to achieve educational goals. PESH subject consists of seven scopes, namely games and sports, development activities, gymnastic activities, rhythmic activities, water activities, outdoor education, and health (Muhammad Reza Destya et al., 2025; Muhammad et al., 2022). Among the materials listed beforehand, all movement activities are carried out on land, only water activity education is carried out in water. Water activities include water play, water safety, water movement skill, swimming, and other activities. In everyday life, a person does not only live in the scope of the plains, but there are times when a person must be able to survive in the water. The water activity studied in physical education is swimming. Swimming has various purposes including for sport education, sport recreation, sport achievement, and rehabilitation (McNaull, 2005). Swimming is also a fun and beneficial sport for the development of the body, both for the muscles and the strength of the heart and lungs (Yan Adhi Permadi, 2019).

Swimming is important to be mastered by an individual to defend himself while in the water, so that no injury or accident will occur. In addition to maintaining safety or self-protection, swimming in the modern era is also used to achieve achievements that are useful for the individual life. In the beginning of swimming learning, students will feel afraid because the teacher has not been able to create a freestyle swimming learning model that makes students feel comfortable learning how to swim. A learning model can be understood when it can convey or channel messages from a source in a planned manner, resulting in a conducive learning environment where recipients can carry out the learning process efficiently and effectively (Moch Haza Miftahul Rizky, 2022). Freestyle swimming is an efficient and easier technique because it uses hand swings across the surface of the water (Shinta Apriliani, 2018).

Audio-Visual media will help the learning process carried out by students (Nuraini & Odi, 2024). Learning with videos includes the use of audio-visual media (Kurniaty Bangun et al., 2024) which is equipped with the material packaged attractively in the form of images and texts (Ramadhan et al., 2020). The presence of video media in the learning process will make learning more effective and potentially arouse the student motivation and interest (Fauzan et al., 2024).

Learning to swim involves physical activity that is carried out in earnest to achieve its learning objectives. Through the use of the right model, such as freestyle swimming learning model, it is hoped that swimming learning objectives will be easily achieved because students will carry out physical activities voluntarily, earnestly, and in a pleasant atmosphere. Swimming is one of the popular sports within various groups in society, because swimming can be carried out by children and adults, male or female (Ilmiah et al., 2018).

The use of swimming aids can help maintain a streamlined or flat body position. Among various swimming aids, swim boards and pull buoys can help maintain buoyancy, making it easier to master basic swimming movements (Badruzaman & Saputra, 2020). The use of swimming aids can improve a person ability to learn swimming, which is in line with the research conducted by (Arhesa et al., 2020).

Swimming learning activities so far do not focus on students but rather on factors that inhibit swimming learning, including facilities and infrastructure (62.5%), risks in swimming learning (69.6%), anxiety (64.7%), fear (73%), and environmental influences (45%). These results show that risk, anxiety, and fear factors are more inhibiting than other factors, such as facilities, infrastructures, and the environment, which is in line with (Raswin & Nasution,

2025). The application of the appropriate learning model is needed in teaching physical education and sports, especially in freestyle swimming.

Several studies have been conducted related to videos and the swimming learning process, including the research stating that the development of a thematic-based Physical Education game video for grade 1 elementary school students is declared suitable to support learning in elementary school (Rizal Bastomi et al., 2018). Another research studied the use of audio-visual materials and drill exercises on the student breaststroke swimming learning outcomes (Suprayitno et al., 2023). Other studies found that there was a significant influence of audio-visual learning on student breaststroke swimming abilities (Dian & Gabriela, 2021) and there was an influence of audio-visual media on the student breaststroke learning outcomes (Abrianto Nugroho et al., 2022). Other research also found that swimming learning video media in PESH subject was found effective (Iqbal et al., 2025a) and audio-visual media played a role on the elementary school student freestyle swimming mastery, swimming speed, and cognitive development related to basic freestyle swimming movements (Narlan et al., n.d.). Study of Ramadhani & Hartoto (2024) on the water activity (swimming) learning models found the effect of the application of freestyle swimming learning on student learning outcomes. Based on the results of the previous research, the presence of video media in learning will have a positive impact on the learning process, including in the swimming learning process.

Previous studies have also confirmed that there is a significant influence of the application of the freestyle swimming learning model using audio-visual learning media and swimming aids on the learning outcomes of junior high school students participating in the freestyle swimming extracurricular. For example, the study of Ginting et al. (2021) studied a model efficacy test by giving freestyle swimming skill tests to beginners to ensure their skill levels before providing treatments and the results after being given treatments of the developed model. The results found that the freestyle swimming model can be created and used for learning as well as to improve beginner freestyle swimming skills. Study of Fernando & Wira Yudha Kusuma (2018) suggested that freestyle swimming can increase the student learning motivation, while Belajaya et al. (2023) and Iqbal et al. (2025b) found that there was an influence of learning models on improving freestyle swimming skills in junior high school swimming extracurricular participants.

Some previous studies only discussed the provision of aids to the swimming ability (Sutyo Nugraha et al., 2023) and the provision of audio-visual learning media to improve swimming ability (Ginting et al., 2021). Previous studies only focused on the provision of media and aids separately. Therefore, this study examined the provision of audio-visual learning media and swimming aids simultaneously and aimed to find out its impacts on knowledge, skills, and the improvement in the freestyle swimming ability of junior high school students in Medan City. The provision of audio-visual learning media is expected to have an influence on the student knowledge in learning to swim, while the provision of swimming aids is expected to have an impact on the student skills in practicing freestyle swimming.

## **METHODS**

This study used a quantitative approach with a weak experimental approach. A one-group pre-test post-test design was used. Experimental research is conducted to determine the causal relationship between variables (Sugiyono, 2023). This study only covered two aspects, namely treatments and success measures. This study aimed to determine the effect of a treatment on students.

### Population and Research Sample

The population of this study was 8th grade students of State Junior High Schools in Medan City, totaling 9 classes with a total of 321 students. The researcher used a cluster random sampling as the sampling technique. The samples of this study amounted to 33 students. The sampling process was performed by collecting all Class VIII class leaders. Each class leader drew a lottery that had been provided to become a research sample. When the leader drew the lottery written as a sample, then the class would become the research sample. This study was conducted in 6 sessions. The 1st session was the knowledge pre-test. The 2nd session was the swimming skill pre-test. The 3rd and 4th sessions were the audiovisual media and aids treatment. The 5th session was the swimming skill post-test and the 6th session was the knowledge post-test. The assessment during the swimming skill pre-test and post-test was assessed by 3 observers who had passed basic and advanced swimming courses and had a swimming license. Data collection used observations, documentations, tests, and measurements.

### Research Procedures

**Table 1.** Research Procedures

Session	Activity	Description
1	Knowledge Pretest	<p><b>Introduction:</b> prayer and attendance</p> <p><b>Core:</b> multiple choice test questions about freestyle swimming in the classroom</p> <p><b>Closing:</b> delivery of information and prayer</p> <p><b>Technique:</b> testing and measurement</p>
2-3	Skills Pretest Continued with Treatment I Audiovisual Media and Aids (swim board, pull buoy)	<p><b>Introduction:</b> prayer, attendance, and warm-up</p> <p><b>Core:</b> (1) 25m freestyle swimming test (assessed by 3 observers using an assessment instrument), (2) audio visual media treatment through freestyle swimming technique learning videos, (3) treatment using assistive devices (swim board and pull buoy)</p> <ul style="list-style-type: none"> <li>• Glide without leg movement using a swim board 3x repetitions</li> <li>• Freestyle leg movements using a swim board 6x repetitions</li> <li>• Freestyle leg movements with one hand holding the swim board 4x repetitions</li> <li>• One arm freestyle movement using a swim board 4x repetitions</li> <li>• Freestyle coordination movements using a swim board 6x repetitions</li> <li>• Freestyle leg movements using pull buoy 4x repetitions</li> <li>• Freestyle coordination movements using pull buoy 4x repetitions</li> <li>• Glide without foot movement and without any aids 2x repetitions</li> <li>• Freestyle leg gliding movement without aids 2x repetitions</li> <li>• Freestyle leg movements with one arm without any aids 2x repetitions</li> </ul> <p><b>Closing:</b> cooling down, evaluation, and prayer <b>Techniques:</b> observation, documentation, testing, and measurement</p>
4-5	Treatment I Audiovisual Media and Aids (swim board, pull buoy) Continued with Skill Post-Test	<p><b>Introduction:</b> prayer, attendance, and warm-up</p> <p><b>Core:</b> (1) audio visual media treatments through video learning for basic freestyle swimming techniques, (2) treatment of aids (swim board and pull buoy)</p>

		<ul style="list-style-type: none"> <li>• Glide without leg movement using a swim board 2x repetitions</li> <li>• Freestyle leg movements using a swim board 6x repetitions</li> <li>• Freestyle leg movements with one arm holding the swim board 2x repetitions</li> <li>• One arm freestyle movement using a swim board 4x repetitions</li> <li>• Freestyle coordination movements using a swim board 4x repetitions</li> <li>• Freestyle leg movements using pull buoy 4x repetitions</li> <li>• Freestyle coordination movements using pull buoy 4x repetitions</li> <li>• One-arm freestyle movements without aids 2x repetitions</li> <li>• Freestyle coordination movements without aids 2x repetitions</li> </ul> <p>(3) 25m freestyle swimming test (assessed by 3 observers using an assessment instrument)</p> <p><b>Closing:</b> cooling down, evaluation, and prayer <b>Techniques:</b> observation, documentation, testing, and measurement</p>
6	Knowledge Post-Test	<p><b>Introduction:</b> prayer and attendance</p> <p><b>Core:</b> multiple choice test questions about freestyle swimming in the classroom</p> <p><b>Closing:</b> prayer</p> <p><b>Technique:</b> testing and measurement</p>

In its implementation, this study used a knowledge instrument through multiple-choice questions and a skill instrument, namely a 25m freestyle swimming test based on an assessment rubric. The 25m freestyle swimming test was assessed by three observers who had passed basic and advanced swimming courses and had license certificates. The knowledge instrument was tested. From the 25 questions tested, 10 questions were obtained and could be used in the research. The questions were developed in the grid presented in Table 2.

**Table 2.** Freestyle Swimming Knowledge Test

No	Question Indicator	Cognitive Level	Question No.
1	Students can name the aids in freestyle swimming.	C1	1
2	Students can find out the record holder for the most gold medals in swimming.	C1	2
3	Students can explain freestyle leg movements.	C2	3
4	Students can explain how to breathe in freestyle swimming.	C2	4
5	Students can explain body position in freestyle swimming.	C2	5
6	Students can determine benefits of swimming for health.	C3	6
7	Students can determine the benefits of using swim boards and pull buoys in learning freestyle swimming.	C3	7
8	Students can conclude the freestyle arm movements.	C4	8
9	Students can analyze the reasons why a freestyle swimmer experiences difficulty in maintaining body position.	C4	9
10	Students can analyze breathing in freestyle swimming.	C4	10

**Table 3.** Freestyle Swimming Skill Assessment Rubrics

		Mark	
		Yes	No
<b>Freestyle Swimming Skills</b>			
<b>No</b>	<b>Body Position</b>		
1	Flat body position		
2	Hip position remains underwater		
3	Keep your feet positioned underwater		
4	Downward gaze		
5	As the hands move, the waist rolls with the shoulders		
<b>Leg Action</b>			
1	Move continuously		
2	Legs move starting from the waist		
3	Both feet are close together		
4	Balanced leg movements with hands		
5	Heel movement breaks the water		
<b>Arm Action</b>			
1	When doing hand movements, the feet continue to move		
2	Hands move to draw water up to the thighs		
3	When doing passive breathing, the position remains constant and the water level does not fall		
4	Head position when breathing in water		
5	During recovery, raise your elbows high		
6	During recovery, the arm is bent		

### Data Analysis Technique

The data analysis utilized the IBM SPSS statistical application. The data analysis technique used included descriptive tests, normality tests, dependent t-tests, and the magnitude of the differences between the pre-test and post-test, with percentages classified into three categories.

**Table 4.** Classification of Pre-Test and Post-Test Improvement Values

No	Increase Value Range	Information
1	< 30%	Low
2	30%-69.9%	Medium
3	>70%	High

### RESULTS

The research began with a description of the validation results of the learning media used in the study. The validation was carried out by learning media experts and swimming material experts. The validation results showed that the learning media used obtained a proportion value of 95.23%, falling into the valid category. Next, a descriptive analysis and normality analysis of the learning outcome data for swimming knowledge and skills were explained. The results of the analysis can be seen in Table 5. From Table 6, the results of the knowledge data analysis, the pre-test value obtained a minimum value of 30.00, a maximum of 90.00, a mean of 67.26, and a standard deviation of 14.83. The results of the knowledge post-test obtained a minimum value of 70.00, a maximum of 100.00, a mean of 83.43, and a standard deviation of 8.65. The results of the pre-test skills data obtained a minimum of 3.00, a maximum of 10.00, a mean of 5.26, and a standard deviation of 2.20. The results of the skill post-test

obtained a minimum value of 5.00, a maximum of 15.00, a mean of 8.53, and a standard deviation of 3.08. The normality test used skewness. Data analysis used descriptive statistics to determine data based on skewness with a value range of  $-1 \leq x \leq 1$  (Tuasikal et al., 2021). From the results of the skewness test, the pre-test and post-test data on the knowledge and skill aspects were normally distributed because the data met the skewness test value ratio.

**Table 5.** Descriptive Analysis Values and Data Normality

Aspect	Hand	N	Min	Max	Mean	SD	Skewness	Kurtosis
Knowledge	Pre	33	30.00	90.00	67.26	14.83	-0.342	0.260
	Post	33	70.00	100.00	83.43	8.65	0.147	-0.510
Skills	Pre	33	3.00	10.00	5.26	2.20	0.993	0.140
	Post	33	5.00	15.00	8.53	3.08	0.819	-0.867

**Table 6.** Paired Sample T-Test

Aspect	t	Sig.	Conclusion
Knowledge	10.094	0.000	Different
Skills	7.742	0.000	Different

Table 7 shows the paired sample t-test data on the knowledge and skill aspects with a Sig. of 0.000 below 0.05, indicating that there were differences in learning outcomes for freestyle swimming knowledge and skills using audio-visual media and swimming aids.

**Table 7.** N-Gain Score Percentage

Aspect	Hand	Mean	$\Delta$	Gain %	Conclusion
Knowledge	Pre	67.25	17.25	52.81%	Medium
	Post	84.53			
Skills	Pre	5.26	3.15	32.55%	Medium
	Post	8.52			

## DISCUSSION

Swimming is the activity carried out in water aimed to improve the motor skills in water. Swimming activities can be carried out in rivers, lakes, seas, beaches, or swimming pools. Swimming in general is also called water sports, which includes games, competitions, and safety (Iqbal et al., 2025b). People whose daily activities are related to nature and water, such as swimming pools, marine tourisms, and living by the river, are required to have swimming knowledge and skills. The swimming learning approach should be carried out by considering the available resources and basic swimming skills in the form of games promoting fun situations by using interesting and easy strategies, methods, materials, and media.

The essence of the game is that the physical activity is carried out earnestly, voluntarily, and fun. Playing, in its essence, is an activity that is used as entertainments (Pande Made Dharma Sanjaya & Nyoman Rediani, 2022). We define play as non-competitive physical entertainments, even though play does not have to be physical. Play is not limited to sports and physical education, although elements of playing can be found in both. Swimming learning also involves physical activity that is carried out in earnest to achieve its learning objectives. Through the appropriate learning approach in swimming, learning objectives will be easily achieved because students will carry out physical activities voluntarily, happily, and fun.

This research is an experimental study aimed to determine the effect of audio-visual media and aids on freestyle swimming learning outcomes. The results showed a significance of 0.000 ( $p$  value  $<0.05$ ), indicating that there was a difference between the average pre-test and post-test scores. Meanwhile, to determine the increase in learning outcomes after the treatment, the results showed an increase in learning outcomes, namely knowledge (52.81%) and skills (32.55%), both of which are included in the moderate category. According to the theoretical basis, audio-visual media is a combination of images and sounds that aims to support learning activities (Prasetya et al., n.d.). The use of appropriate media can create learning experiences by involving the senses of sight and hearing so that it can improve the student understanding and influence good learning outcomes. Meanwhile, aids are objects used in the learning process to improve thoughts, feelings, abilities, and skills aimed at supporting the achievement of a more effective learning process (Muchsin, 2021). The aids for swimming learning include swim boards and pull buoys. The function of the swim board and pull buoy is as a learning aid for swimming because it helps float the body on the surface of the water.

Students must be diligent when learning using audio-visual media and tool aids (swim board and pull buoy) to maximize freestyle swimming learning outcomes. Audio visual aids are learning media that can help students improve or enhance learning outcomes. This is relevant to the research of Raswin & Nasution (2025), stating that audiovisual media could influence freestyle swimming learning outcomes, and the research of Susanto & Mintarto (2021), suggesting the effect of audiovisual media on breaststroke learning outcomes. It is also in line with the research of Sutyo Nugraha et al. (2023), which found that the use of swim board and pull buoy aids affected freestyle swimming learning outcomes, and the research by Suprayitno et al. (2023), which found that the use of glide board and pull buoy aids affected freestyle swimming learning outcomes.

The application of audiovisual media used learning videos that could be accessed via computers, laptops, and mobile phones by presenting freestyle swimming videos. This freestyle swimming learning video covered body position, arm movement, breathing, leg movement, and movement coordination. It consisted of two videos, namely freestyle swimming with and without swimming aids, which were applied in the movement process. The learning video was uploaded on social media so that students could learn freestyle swimming materials during swimming lessons or outside the lessons. From the 33 subjects during the swimming skill pre-test, no student was able to complete the 25m freestyle swimming distance. During the post-test, there were 4 students who were able to complete the 25m freestyle swimming distance. Although other students were unable to complete the 25m freestyle swimming distance, their freestyle swimming technique improved.

Audio visual media and swimming aids can influence learning outcomes because the students can apply it in the movement process after watching learning videos (Raswin & Nasution, 2025), while swimming aids are drilled by using swim boards and pull buoys with repetitions so that they can foster the student self-confidence, eliminate the fear of water, provide a sense of joy, and make it easier for students to carry out learning (Iqbal et al., 2025a). Freestyle swimming drills that are carried out with several repetitions include body position, leg movements, arm movements, breathing, and movement coordination. There are several factors that can also influence learning outcomes, including internal and external factors. The internal factor might be the condition of students, who were physically and mentally healthy and willing to learn swimming from the beginning to the end of learning. External factors came from the involved parties, starting from researchers, teachers, and

observers who assisted in the research as well as the use of audiovisual media and swimming aids (swim boards, pull buoys) during the learning activities.

## CONCLUSION

This study concludes that audio-visual media and aids have an impact on freestyle swimming learning outcomes in the knowledge and skill aspects. Audio-visual media could help students obtain information about the accuracy of swimming movements so they could apply it in the movement process during swimming learning. Swimming aids, in the form of swim boards and pull buoys, could help students during the drilling process by increasing the student confidence, thereby reducing their fear of water. The combination of audio-visual media and aids provides complete evidence of adequate PESH learning in both theoretical and skill materials so that learning outcomes can be more optimal.

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## AUTHORS' NOTE

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