

## **Aerofight Gymnastic Model to Improve Physical Fitness of Students in Martial Arts Special Sports Class: Content Validity**

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**ABSTRACT:** Optimal physical fitness has a crucial role in achieving superior student performance. This study aims to develop an Aerofight gymnastics model that will improve students' physical fitness. Participants in this study were five material experts, two experts in the field of gymnastics, and three experts in the field of martial arts. This research uses a development method with the ADDE Model approach. This research is divided into three stages, namely: (1) qualitatively analyzing documents in the form of relevant review literature; (2) developing aero fight gymnastics models to improve physical fitness and compile questionnaires as instruments to be given to experts; (3) After the six models were made, researchers validated with five experts using the Delphi Technique. Based on the calculation results, the total validity of the contents of each statement item was obtained at 0.91. Based on the validity of Aiken, the aero-fight gymnastics model has a good value for improving physical fitness; this shows that the aero-fight gymnastics model can be used for Special Sports Class Martial Arts students.

**KEY WORD: Gymnastics, Aerofight, Physical Fitness**

### **INTRODUCTION**

Sports coaching and development are important in increasing national sports achievements (1). Achievement in sports is not necessarily easy without training; many people need to understand the importance of the coaching process in achieving sports

achievements (2,3). Coaching carried out consciously, planned, organized, and directed can achieve maximum achievement (4). Sports achievement coaching requires seriousness and commitment in a structured and continuous manner; coaching is a process that cannot run instantly (5). Therefore, sports coaching is

inseparable from improving physical fitness. Physical fitness is a good summative measure of the body's ability to perform physical activity and exercise, and it also provides an important summative indicator of health (6). Physical fitness is related to measurable health and skills, including cardiorespiratory fitness (CRF), muscle strength and endurance, body composition, flexibility, balance, agility, coordination, reaction time, and strength (7).

The important role of physical fitness in the condition of one's body is so that one can carry out daily work without causing fatigue (8). The function of physical fitness is to develop the ability and ability of every human being which is useful for enhancing work power (9). The higher a person's physical fitness, the higher his physical workability (10).

Previous research has shown that Physical Fitness is positively associated with a healthy weight (11), psychological well-being (12), and real-world task performance (13). Poor physical fitness can increase the risk of cardiovascular disease (14) and metabolic and prevalence of depression-related symptoms (15) or related anxiety in childhood; This condition can also continue into adulthood (16).

Athletes who have different backgrounds of talent and physical ability need coaches who have discipline in coaching (17). In addition, success in coaching athletes will be largely determined by the interaction between coaches and athletes who are coached (18). This lack of ability and skill exposes many athletes who train seriously, some movements are unstable, not sturdy, less agile, and look less motivated (19). Many athletes have less physical fitness, as seen in the physical condition of athletes who are easily exhausted when participating in the training process and learning process at school (20).

As a consideration to overcome the problems that have been described and based on previous research, researchers consider the need for a solution to improve physical fitness through aerobic gymnastics in accordance with the characteristics of martial athletes, so that it is

expected to make athletes more motivated during the training process. Then researchers created martial arts-based aerobic gymnastics called aerofight gymnastics. Aerofight gymnastics itself is a combination of aerobic gymnastics and martial movements. The difference between this study and previous research is in the aerobic gymnastics model given using martial movements. The aim of this research is to develop an Aerofight gymnastics model to improve the physical fitness of students in sports classes specifically for martial arts.

## METHODS

This research is included in the research and development (R&D) research category. This research uses a development method with an ADDIE approach. The ADDIE model is an instructional design centered on individual learning, has immediate and long-term phases, is systematic, and uses a systems approach to human knowledge and learning (21, 22,23). Model development is defined as a conceptual design process in an effort to improve the function of a previously existing model, through the addition of learning components that are considered to improve the quality of goal achievement (24). ADDIE is an abbreviation for Analysis, Design, Development Implementation and Evaluation (25). According to the product development steps, this research and development model is more rational and more complete than the 4D model (Define, Design, Development, and Disseminate) (26). This model can be used for various forms of product development such as models, learning strategies, learning methods, media and teaching materials. The ADDIE model was developed by Dick and Carry to design learning systems.

At this stage, the subject of the experiment was to involve five material experts, namely two experts in the field of gymnastics and three experts in the field of martial arts.

Researchers conducted a qualitative analysis using documents in the form of relevant literature reviews in the first stage, then conducted field observations and interviews to

rationalize the problem so that it could be used to create an Aerofight Gymnastics Model to Improve Physical Fitness of Martial Sports Students, as well as questionnaires given to experts (22,23). After compiling the gymnastics model, researchers validated seven experts using the Delphi technique. In the third stage, researchers met with each expert one by one in the form of suggestions with Likert scale assessments of 1–5, then improved the suggestions obtained and conducted quantitative analysis using the Aiken formula (27) yang diolah menggunakan bantuan aplikasi excel. which is processed using the help of the Excel application. Aiken's formula is as follows:

#### Formula Aiken Lawshe

$$V = \Sigma s / [n(c-1)]$$

$$S = r - lo$$

Lo = the lowest validity rating score (eg 1)

C = the highest validity rating score (eg 5)



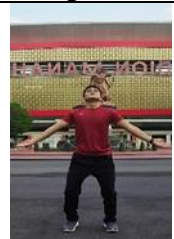



R = the score given by the assessor











### STATICAL RESULTS

The following are the results of the aerofight gymnastics model to improve the physical fitness of martial arts students, based on quantitative analysis by experts. Tables 3 and 4 show the findings in the following ways:











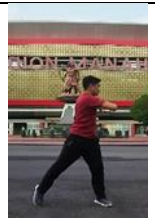


**Table 1. Aiken Formula**











**Table 2. Aerofight gymnastic model products to improve physical fitness**













PART	SERIES	COUNT	HOW IT WORKS	PICTURE	
Greetings	A	2X8	Feet: the initial position of the feet is tight and the hands are at the sides of the body, then Open the legs shoulder-width apart.		
			Hand: Extend one left and one right hand sideways and back up, sideways, and down.		
Stretch 1	A1	2X8	Pressing the head upwards (figure 1) and Pressing head down (figure 2) <ul style="list-style-type: none"> <li>- Legs: the position of the legs at shoulder-width apart</li> <li>- Hand: Both hands help Press.</li> </ul>		








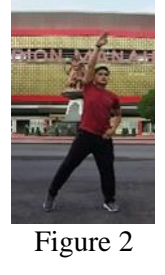


	A2	2X8	<p>Pressing the head to the right (figure 1) and Pressing your head to the left (figure 2)</p> <ul style="list-style-type: none"> <li>- Legs: the position of the legs at shoulder-width apart</li> <li>- Hand: One hand helps press and the other hand is on the waist.</li> </ul>		
	A3	2X8	<p>Pressing the head to the right (figure 1) and Pressing your head to the left (figure 2)</p> <ul style="list-style-type: none"> <li>- Legs: the position of the legs at shoulder-width apart</li> <li>- Hand: One hand helps press and the other hand is on the waist.</li> </ul>		
Stretch 2	B1	2X8	<p>The left hand is straight to the right and the elbow is held by the right hand (Figure 1) and the left hand is bent backwards and held by the right hand (Figure 2)</p> <p>Legs: the position of the legs is open shoulder-width apart.</p>		
	B2	2X8	<p>The right hand is straight to the left and the elbow is held by the left hand (figure 1), and the right hand is bent backwards and held by the left hand (figure 2).</p> <p>Legs: the position of the legs is open shoulder-width apart.</p>		
	B3	2X8	<p>Both hands are collared up, and at the bend of the right hand, hold the left elbow, and the left hand holds the opposite right elbow, and straighten both hands up.</p> <p>Legs: the position of the legs is open shoulder-width apart.</p>		












Warming	A1	2X8	On-site road	 <p>Figure 1</p>	
	A2	2X8	Bow your head downward (figure 1) and forward (figure 2). <ul style="list-style-type: none"> <li>- Foot: the position of the foot of the road in place</li> <li>- Hands: Both hands on the waist</li> </ul>	 <p>Figure 1</p>	 <p>Figure 2</p>
		2X8	Bending your head to the right (Figure 1) and left (Figure 2) <ul style="list-style-type: none"> <li>- Foot: the position of the foot of the road in place</li> <li>- Hands: Both hands on the waist</li> </ul>	 <p>Figure 1</p>	 <p>Figure 2</p>
	B1	2X8	Interval <ul style="list-style-type: none"> <li>- Hands: both hands towards the side, then straight up while adjusting the breath.</li> <li>- Legs: Both legs are tight and straight.</li> </ul>	 <p>Figure 1</p>	 <p>Figure 2</p>
	B2	4X8	Cross alert to the right (Figure 1) and cross alert to the left (Figure 2) alternately. <ul style="list-style-type: none"> <li>- Hand: underjaw combat standby</li> <li>- Legs: combat standby</li> </ul>	 <p>Figure 1</p>	 <p>Figure 2</p>
		3X8	Rotate the right collar (pictured 1) and move it towards the left (pictured 2). <ul style="list-style-type: none"> <li>- Hands: both hands are in front of the chest.</li> <li>- Legs: combat standby legs</li> </ul>	 <p>Figure 1</p>	 <p>Figure 2</p>
		3X8	Stabbing motion. Straight hand piercing position Right collar (figure 1) and straight hand piercing position towards left (figure 2)		









			<ul style="list-style-type: none"> <li>- Hand: one hand on the waist</li> <li>- Legs: combat standby legs</li> </ul>	Figure 1	Figure 2
	B3	3X8	<p>Stabbing motion. The left hand is straight in the upward stabbing position (Figure 1), and the right hand is straight in the upward piercing position (Figure 2).</p> <ul style="list-style-type: none"> <li>- Hand: one hand on the waist</li> <li>- Legs: combat standby legs</li> </ul>	 <p>Figure 1</p>	 <p>Figure 2</p>
		4X8	<p>Fast-forward punch movement. Left hand, Right collar straight punch position (figure 1), and Right hand straight punch position (figure 2).</p> <ul style="list-style-type: none"> <li>- Hand: one hand under the jaw</li> <li>- Legs: combat standby legs</li> </ul>	 <p>Figure 1</p>	 <p>Figure 2</p>
		4X8	<p>Fast sideways punch movement. Left hand, Right collar straight punch position (figure 1), and Right hand straight punch position (figure 2).</p> <ul style="list-style-type: none"> <li>- Hand: one hand under the jaw</li> <li>- Legs: combat standby legs</li> </ul>	 <p>Figure 1</p>	 <p>Figure 2</p>
		2X8	<p>Interval</p> <ul style="list-style-type: none"> <li>- Hands: both hands towards the side, then straight up while adjusting the breath.</li> <li>- Legs: Open your feet shoulder-width apart</li> </ul>	 <p>Figure 1</p>	 <p>Figure 2</p>
Core	A1	4X8	<p>Standby fighting left foot in front of step forward movement (figure 1) and step back (figure 2)</p>	 <p>Figure 1</p>	 <p>Figure 2</p>






	A2	8X8	Attacking Punch Movement Standby fighting left foot in front of the forward step movement add a right hand straight punch (figure 1) and a step back add a left hand straight punch (figure 2).		
	A3	2X8	Interval - Hands: both hands towards the side, then straight up while adjusting the breath. - Legs: Open your feet shoulder-width apart.		
	B1	4X8	Standby to fight right foot in front of step forward (figure 1) and step back (figure 2) movements		
	B2	8X8	The movement of the punch attacked Standby fight: right foot in front of the movement; step forward; add a straight punch of the left hand (figure 1); and step back; add a straight punch of the right hand (figure 2).		
		2X8	Interval - Hands: both hands towards the side, then straight up while adjusting the breath. - Legs: Open your feet shoulder-width apart.		
	C1	4X8	Cross alert to the right (Figure 1) and cross alert to the left (Figure 2) alternately. - Hand: underjaw combat standby - Legs: combat standby		

	C2	8X8	<p>Movement to deflect attacks</p> <p>Legs: The position of the legs is raised up, and the position of the knees is at waist level. Do movements alternately right and left.</p> <p>Hand: Position the hand down towards the foot, one hand at the waist, and do movements alternately right and left.</p>	 <p>Figure 1</p>	 <p>Figure 2</p>
	C3	2X8	<p>Interval</p> <ul style="list-style-type: none"> <li>- Hands: both hands towards the side, then straight up while adjusting the breath.</li> <li>- Legs: Open your feet shoulder-width apart.</li> </ul>	 <p>Figure 1</p>	 <p>Figure 2</p>
	D1	4X8	<p>Rotate the right collar (pictured 1) and move it towards the left (pictured 2).</p> <p>Hands: both hands are in front of the chest.</p> <p>Legs: combat standby legs</p>	 <p>Figure 1</p>	 <p>Figure 2</p>
	D2	4X8	<p>Stabbing motion. The left hand is straight in the upward stabbing position (Figure 1), and the right hand is straight in the upward piercing position (Figure 2).</p> <p>Hand: one hand on the waist</p> <p>Legs: combat standby legs</p>	 <p>Figure 1</p>	 <p>Figure 2</p>
	D3	2X8	<p>Interval</p> <ul style="list-style-type: none"> <li>- Hands: both hands towards the side, then straight up while adjusting the breath.</li> <li>- Legs: Open legs, 2X shoulder width</li> </ul>	 <p>Figure 1</p>	 <p>Figure 2</p>



	E1	8X8	Katas punch motion: both hands up and down at shoulder height, leg position at open 2X shoulder width (figures 1 and 2).		
	E3	8X8	Combat standby position towards the right (Figure 1), add a quick blow of the left hand to the right (Figure 2), then pull it back parallel to the chest (Figure 3).		
					
	E4	2X8	Interval - Hands: both hands towards the side, then straight up while adjusting the breath. - Legs: Open your feet shoulder-width apart.		
Cooling Down	F1	3X8	Bend the legs to the right of the hand raised straight up (figure 1), straighten the hands forward at chest level (figure 2), and pull and bend the legs back (figure 3).		

				
	F2	3X8	Bend the legs to the right of the hand raised straight up (figure 1), straighten the hands forward at chest level (figure 2), and pull and bend the legs back (figure 3).	<div>   </div> <div>  </div>
	F3	2X8	The left hand is straight to the right, and the elbow is held by the right hand (figure 1), and the left hand is bent backwards and held by the right hand (figure 2). Legs: position the feet in parallel and tiptoe one to the rhythm.	<div>   </div>
	F4	2X8	The right hand is straight to the left and the elbow is held by the left (figure 1), and the right hand is bent backwards and held by the left hand (figure 2). Legs: position the feet in parallel and tiptoe one to the rhythm.	<div>   </div>

	F5	2X8	Both hands are collared up, and at the bend of the right hand, hold the left elbow, and the left hand holds the right elbow, and straighten both hands up.  Legs: the position of the feet in parallel		
Closing Greetings		1X8			
					

**Table 3. Content Validity Based on the Aiken Formula Aerofight Gymnastics Model**

Question Indicator	Assessment					S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	Σs	n(C-1)	V
	I	II	III	IV	V								
Item 1	3	3	2	3	3	2	2	1	2	2	9	10	0.9
Item 2	3	3	3	3	2	2	2	2	2	1	9	10	0.9
Item 3	3	2	3	3	3	2	1	2	2	2	9	10	0.9
Item 4	2	3	3	3	3	1	2	2	2	2	9	10	0.9
Item 5	2	3	3	3	3	1	2	2	2	2	9	10	0.9
Item 6	3	3	2	3	3	2	2	1	2	2	9	10	0.9
Item 7	3	3	3	3	3	2	2	2	2	2	10	10	1
Item 8	3	3	2	3	3	2	2	1	2	2	9	10	0.9
Item 9	3	3	3	3	3	2	2	2	2	2	10	10	1
Item 10	3	3	3	3	2	2	2	2	2	1	9	10	0.9
Item 11	3	3	3	3	3	2	2	2	2	2	10	10	1
Item 12	3	2	2	3	3	2	1	1	2	2	8	10	0.8

**Table 4. Results of the conclusion of the validity of the content**

Question Indicator	Penilai					S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	S <sub>4</sub>	S <sub>5</sub>	Σs	V
	I	II	III	IV	V							
Item 1-12	34	34	32	36	34	22	22	20	24	22	110	0.91

Based on Aiken's analysis, it is known that: Item 1 obtained a coefficient value of 0.9; Item 2 obtained a coefficient value of 0.9; Item 3 obtained a coefficient value of 0.9; Item 4 obtained a coefficient value of 0.9; Item 5 obtained a coefficient value of 0.9; Item 6 obtained a coefficient value of 0.9; Item 7 obtained the value of the coefficient 1; Item 8 obtained a coefficient value of 0.9; Item 9 obtained the value of the coefficient 1; Item 10 obtained a coefficient value of 0.9; Item 11 obtained the value of the coefficient 1; Item 12 obtained a coefficient value of 0.8. The result-item statement matches the criteria. The overall average was 0.91 in the High category. Hasil selengkapnya dapat dilihat pada gambar berikut:

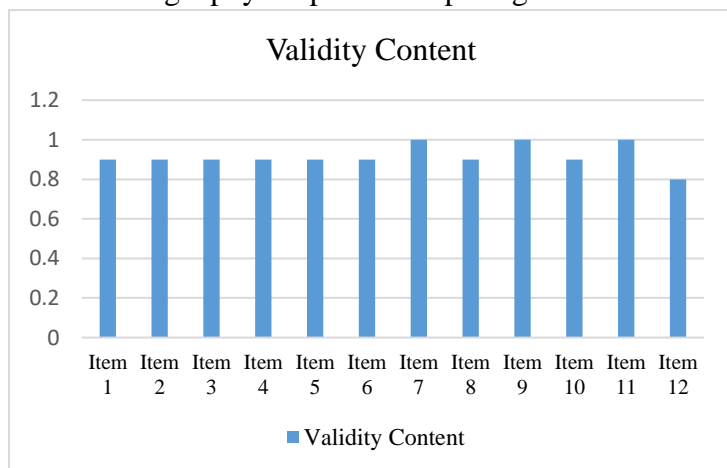


Figure 1. Content validity level

## DISCUSSION

Aerofight gymnastics combines aerobic gymnastics with martial arts techniques, creating a combination of fun and effective exercises. Aerofight gymnastics, or combat-themed aerobics, is a type of aerobic gymnastics that combines gymnastic movements with fighting elements.

Based on previous research, it shows that regular and targeted pencak silat training can increase the physical fitness level of mentally retarded children aged 12 years and over (28). Other research also shows that aerobic exercise can increase students' physical fitness levels (29). This opinion is in line with previous research which concluded that there was an increase in the physical fitness level of moderately mentally retarded children aged 12 years and over after being given treatment in the form of pencak silat training for 6 weeks with three training sessions for 20 - 30 minutes a week (30).

Aerobic exercise is an activity to move body parts, force the body to repair systems in the body, and demand more oxygen during the duration of exercise (31). Aerobic gymnastics movements are made intentionally and arranged systematically and are done regularly and repeatedly (32). Aerobic exercise done correctly can provide benefits for physical fitness. Fitness is often associated with a person's ability to perform daily work without feeling tired (33). Physical fitness is an important health characteristic that is entirely the result of one's activities (34,35).

Based on previous research on the Effect of Aerobic Gymnastics on the Level of Physical Fitness Shiva shows aerobic exercise, one of which can increase physical fitness for the body, with an exercise intensity of 60%–80% and the time needed ranging between 45–60 minutes (36). Aerobic exercise stimulates fat catabolism, forms fat catabolism, forms a good blood pressure response, and improves cardiovascular fitness (37). This happens because gymnastics makes the heart beat faster, so it can strengthen the muscles. Therefore, physical fitness has a central role in maintaining the health and quality



of learners. A number of studies show that a regular and intense aerobic exercise program can increase cardiorespiratory capacity. Studies conducted by Donnezan et al., (2018) Involving adult participants who participated in aerobic exercise sessions for 12 weeks, the results showed a significant improvement in cardiorespiratory ability.

The success of athletes in achieving sports achievements cannot be separated from their optimal level of physical fitness. Good fitness not only contributes to improved sports performance but also plays an important role in preventing injuries and ensuring the general well-being of athletes.

## **CONCLUSION**

The results of this research will provide an overview of the content validity of the Aerofight Exercise Model as a tool to enhance the physical fitness of students. So the Aerofight gymnastics model developed in this research has the potential to improve the physical fitness of students in sports classes specifically for martial arts. The implications of this study are to offer practical guidance to educational institutions in designing effective exercise programs to improve the physical fitness of students. Furthermore, this research may also pave the way for the development of other innovative and engaging exercise approaches aimed at enhancing the physical fitness of students.

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