

# Pencak Silat Athlete Test Instruments and The Development of Sports Science

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**Abstract.** The instrument is one of the measuring instruments used as a data collection process in any form. In this literature study process that researchers want to know the role of science in the development of pencak silat sports through several test instruments produced from research results. The method used is to analyze the needs of the instrument so that it can complement the problems that occur and deficiencies in the sport of pencak silat silat. After carrying out a review of some of the literature analyzed that the resulting instrument consists of several tests that can complement the overall deficiencies that occur in the sport of pencak silat and the role of science in its development. The role of sports science looks very instrumental in order to meet the needs of pencak silat sports coaching, especially coaching in sports achievement. Some of the instruments produced utilize current technology using a research and development method approach.

**Keywords:** Pencak Silat Athlete Test Instrument; Sports Science

## INTRODUCTION

Development knowledge knowledge a deep country field sport No free from role as well as discipline science in the country. clump knowledge sports experience very development \_ Good seen from period time 15 year back. surge *SportsScience* \_ roar and so on knowledge sports enter in the era of revolution industry 4.0. Revolution era Industry 4.0 forced whole clump knowledge must follow technology is developing, so clump knowledge sports must follow era change. explained (Lase, 2019) Revolution i industry Generation 4.0 marked with increasing connectivity, interaction as well as development digital systems, intelligence artificial, and virtual. Interaction, connectivity and digital systems are one \_ salient feature of the revolution industry 4.0 up to source Power competent human \_ in the field knowledge sports must follow progress that is happening.

Moment This existence knowledge sports in Indonesia is increasing real and accepted by all layer society. There is the spirit of the slogan "Exercising Society and Socializing Sports" be part that simple \_ real can help development clump knowledge sports. Along walk time existence knowledge sports reveal himself with emergence of study programs clump knowledge sports both strata 1, strata 2 and strata 3 as well accompanied with increase academics holds Masters, Doctoral and Professor degrees. Impact is the more many the resulting research so that facilitate practitioners \_ in apply results research that can \_ give form real development sport

throughout sector. Besides That results research become input for government as determinant policy sports in Indonesia through (Ministry Youth and Sport), which is partners the work of academics in advance sport past achievements \_ poured in (Republic of Indonesia Sports Law, 2022). Good synergy process \_ between determinant policy with academics and practitioners \_ in field sports produce something that can give contribution to progress performance sport.

Branch sport pencak silat is inheritance culture the Indonesian people who arrived moment This can bring up various inclined academics \_ focus review the scientific needed branch the. Need in framework chase behind change in the era of 4.0 towards society 5.0 is must academic branch sport pencak silat. Emerging scientific research \_ in field academic penetrate on among teachers, students, lecturers and in the end produce A product persistent development \_ with need progress branch sport pencak silat. Research results has appear since 2010 up to moment these are academics Keep going do studies that can give A novelty / *Novelty* with objective complete weaknesses that occur on branch sport pencak silat. Research conducted \_ study from aspect coaching, technology, analysis movement, learning, as well a number of problems that occur in sport pencak silat. Study appear caused exists must problem \_ completed and given solution so that can zoom out problems that occur on branch sport pencak silat.

Preparation product study produced by

(Kuswanto, 2016) with produce *Preparation Test Physique Athlete Adult Pencak Silat Category fight* Where product results study This produce nine type test physique athlete pencak silat mature category fight . *Developing a Performance Assessment Of Kicks In The Competition Category Of Pencak Silat Martial Arts*. Produced by (Hariono et al., 2017) who reviewed about evaluation kick pencak silat seen from aspect motion biomechanics . Where in study produce method evaluation kick reviewed from motion biomechanics and then group become a number of category ie *very good, good, average, poor, and very poor*. (Mustain & Akbar, 2021) produce *\_ Development Tool Measuring Speed Reaction Kicks And Punches Based on Whole Body Reaction (WBR) in Athletes Pencak Silat* . Tool measuring speed reaction kicks and punches This can used as a media tool measuring speed reaction kicks and punches on branches sport martial . Principle the resulting work like working principle *\_ stopwatch* Where there is *t start* and *stop* for start and end test . The difference is lies on the sensor , where the stimulus is lamp / bazer / lamp and bazer light up then the timer on the smartphone starts walk . Moment bag kicked / hit so will arise vibrations captured by the vibration sensor

Based on background already *\_ outlined* that instrument product test Skills pencak silat movements are arranged according to the needs and demands of the problems that must be answered by academics of pencak silat. The basis for the preparation of the test instrument comes from the problems that arise in fostering the achievements of the pencak silat sports branch. The existence of the preparation of research

products in the form of test instruments can provide a simulation of problems that cannot be resolved in fostering the achievements of the pencak silat sports branch.

**METHOD**

Method used was *a literature review* using the Google Scholar data base with the keyword Pencak silat athlete test instrument. The articles analyzed were published from 2016 to 2023 , using the criteria of Q3, *Crossref* , Sinta 2 and Sinta 3 as well as international *proceedings* . Each research produces a product in the form of a test instrument for the pencak silat sport. The literature search process uses *Google Scholar* because the authors focus on several journals and *proceedings* who examines the sport of pencak silat with the assumption that the focus and development of the sport of pencak silat is in the Indonesian state and scientific knowledge. Understanding knowledge of pencak silat is the reason that academics in Indonesia have more control over sports and deeper movement characteristics. In the future the author will do study deep accompanied with characteristic reference *\_ thorough* .

**RESULTS AND DISCUSSION**

Based on results search related findings from the manufacture of research products in the form of test instruments in the sport of pencak silat from year 2016 *\_ hi* with 202 3. The search results are done using *Google Scholer* can be seen in the following table:

**Table 1.** Literature Search Results for Pencak Silat Test Instruments

Index	Author and year	Melting <i>Google Scholar</i>			
		Name of Journal / Proceedings	Title	National	International
Q3	(Syaifullah & Doewes, 2020)	International Journal of Human Movement and Sports Sciences	Pencak Silat Talent Test Development	-	✓
Sinta 2	(Kuswanto, 2016)	Sports Journal	Preparation of Physical Tests for Adult Pencak Silat Athletes in the Competition Category	✓	
Sinta 5	(Mustain & Akbar, 2021)	Socioeducation	Development of a Kick and Punch Reaction Speed Measurement Tool Based on Whole Body	✓	

			Reaction (WBR) in Pencak Silat Athletes	
Crossref	(Saleh, 2020)	International Journal of Physiology, Nutrition and Physical Education	Development of an instrument of speed kick in pencak silat based on technology	- ✓
	(Putra & Komaini, 2021)	Proceedings of the 1st International Conference on Sport Sciences, Health and Tourism (ICSSHT 2019). Atlantis Press	Validity and Reliability of Pencak Silat Straight Kick Test Instrument (ANQO Test)	✓
Sinta 2	(Saputro & Siswantoyo, 2018)	Sports Journal	<i>Preparation of Test Norms Physique Youth Pencak Silat Category fight</i>	✓
Sinta 2	(Hariono et al., 2017)	The Journal Of Education Development	Developing A Performance Assessment Of Kicks In The Competition Category Of Pencak Silat Martial Arts	✓

The results of the research that has been described in the table above all produce research products and high *novelty*. It begins with research findings (Kuswanto, 2016) which produce a physical test for the pencak silat sport which answers the specific test needs of the pencak silat sport. The results of this study produced 9 (nine) test items which all involved the dominant physical component in the sport of pencak silat. The focus on determining the biomotor components of sports is a needs analysis that must be carried out so that the measurement goals are according to the sport. This explanation is corroborated by the opinion (Hariono, 2006) that the dominant components in the sport of pencak silat are speed, strength, endurance, flexibility, coordination, agility while the test instruments produced are *Side Splite, Sprint 40 Meters, Push Up 30 Seconds, Sit Up, Back Up, Standing Triple Jump, Shuttle Run, Sprint 300 meters, Bleep Test*.

Furthermore, the findings (Saputro & Siswantoyo, 2018) related to test instruments in the pencak silat sport confirm the results obtained. Whereas the 8 (eight) tests produced all refer to theory including to determine the

flexibility test in this research refers to (Carrera, 2015) with the explanation that the need to carry out attacks requires flexibility in order to produce movements that have a free *range of motion* in all movements, whether kicks, punches, drop. The speed component is used in an effort to carry out attacks in the shortest possible time so that this component is measured as a priority part in pencak silat. Other components are agility, power, endurance which are all included in the dominant component of the sport of pencak silat. The results of the test items include *sit and reach, 30 m sprint, 30 seconds, push up, wall sit test, wall sit test side step, standing broad jump, 300 m sprint, multi fitness test*.

In the current year, several scientific developments *have* produced research products, including (Hariono et al., 2017) found a test instrument for analyzing the biomechanics of pencak silat techniques and (Saleh, 2020) produced a kick speed instrument for female and male athletes. The following is a technology-based pencak silat kick speed test instrument for women and men:

Nr	Kick Name	Product Moment	scores	Valid. (PM> 0.75 - 0.99)
1.	Sickness kick	0,80 – 0,94	Strong correlation	Correlation is very strong
2.	Front Kick	0,99 – 0,99	Strong correlation	
3.	"T" kick	0,96 – 0,97	Strong correlation	

**Table 2.** Results of Content Validity Ratio Female

Nr	Kick Name	Product Moment	scores	Valid. (PM> 0.75 - 0.99)
1.	Sickness kick	0,90 – 0,91	Strong correlation	Correlation is very strong
2.	Front Kick	0,77 – 0,98	Strong correlation	
3.	"T" kick	0,83 – 0,92	Strong correlation	

**Table 3.** Results of Content Validity Ratio Male

Research results This showing that the sport branch of pencak silat has used technology as an analytical material to find a product in the form of a test instrument. The analysis of making this product shows that kicks are the most dominant movement in the process of a pencak silat competition, so it is necessary to know the athlete's kick speed.

Furthermore (Syaifullah & Doewes, 2020) makes the product as a tool to identify the talent of prospective athletes in the sport of pencak silat by involving elements of talent, physical condition, technique, achievement, sports measurement tests at the age of 12-14 year olds. The results of the study were divided into 15 test items by dividing 5 sets of anthropometric test items, 5 sets of physiological test items and 5 sets of biomotor test items. As for the results of the guideline test on a series of movements involving the anaerobic energy system because pencak silat athletes are required to develop the components of power, strength, speed, agility, reaction speed. This component is used to perform special movements including kick speed, kick agility, kick coordination, and the power of pencak silat kicks. It was explained in the discussion that the importance of a talent identification program that is carried out early on, aims to make it easy for coaches to determine the potential of prospective athletes in the future.

The results of the research data show that there are similarities in the analysis of needs and products. The research product is in the form of test instruments related to pencak silat, starting from the movement analysis instrument for pencak silat, the instrument for scouting talent for the pencak silat sport, as well as forms of tests in assessing the ability of the physical aspects and sports techniques of pencak silat.

**CONCLUSION**

Pencak silat which is considered traditional by some people has now followed the development of science. Some research results using appropriate methods can argue against this

view. This is because the pencak silat community, both academics and practitioners, has taken advantage of the development of science and technology.

Several research results that are in accordance with the development of pencak silat and sports science have been produced. One of the studies studied in this paper is the test instrument in the sport of pencak silat. All instruments produce products that can be utilized for the benefit of the pencak silat sport, especially in conducting tests and measuring abilities related to pencak silat. Instruments are made according to the needs and requirements of the sport of pencak silat. Of course, all products have been studied for the needs that must be met in the sport of pencak silat. The existence of a test instrument that has been made through the appropriate stages or methodology is expected to be able to assist the wider community in carrying out achievement development by being recorded and planned based on data and facts.

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