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The Analysis of Hand Motion Angle and Distance of 200 Meters Rowing Athletes Administrators the Province Of Aceh

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ABSTRACT: This research entitled "The Analysis Of Hand Motion Angle And Distance Of 200 Meters Rowing Athletes Administrators The Province Of Aceh" *Kayak*is one of the branches of water sports that use human power takes place on water. One of the factors that can affect the speed of rowing is the angle of movement and speed when rowing. The purpose of this study was to determine the angle of hand movements consisting of three phases, namely the position of the paddle into the water, the position of the oar pulling from the water, the position of the oar out of the water, and the speed of rowing a boat like a distance of 200 meters. This research is a type of evaluation research using descriptive methods through a quantitative approach. The population in this study were all of the Aceh Province Boarding oar Athletes as many as 6 athletes consisting of 5 male athletes and 1 female athlete. The instrument used in this study was a hand movement angle test measured with a 1300D camera and Phantom Software, a 200 meter rowing speed test was measured using stopwatch. Data collection techniques were by measuring the angle of hand movement and measuring a 200 meter rowing speed. Technique of analyzing angular motion data uses Phantom Software, AutoCAD Software and speed measurement. Based on the results of the study, (1) the angle of hand motion produced by the first sample has an average value of 110 °, the second sample 147 °, the third sample 142 °, the fourth sample 142 °, the fifth sample 116 °, the sixth sample 108 °, (2) The results of measuring the speed of rowing boats like a distance of 200 meters have an average speed of the first sample 01.40 minutes/second, the second sample 02.37 minutes/second, the third sample 02.12 minutes/second, the fourth sample 01.59 minutes/second, the fifth sample 01.50 minutes/second, the sample fifth 01.47 minutes/second, (3) Based on the results of data analysis, the results can be obtained that the angle of motion of the hand affects the speed of rowing distance of 200 meters when rowing a boat like a distance of 200 meters, that the smaller the angle of motion produced, the greater the resulting velocity at rowing, and vice versa the greater the value of the angle of motion produced, the slower the boat's speed when sliding.

Keywords: Analysis; Angular hand movements; Speed; Oar Athletes Administrators of Aceh province.

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I. FOREWORD

Sports are not only used as a means to achieve a healthy life, but sports also aim to attempt an achievement. Athlete achievement is a collection of tasks that are charged to the athlete (Adisasmito 2007:42). Factors that influence optimal achievement in athletes, namely: physical, technical, tactic, and psychological factors (Adisasmito, 2007:43). Rowing is a sport with agility, using boats and paddles on water, both in rivers, lakes and at sea. Achievement of the results of rowing in rowing athletes is the ability to move the oar to go to the maximum to reach the finish line. The movement that occurs when rowing is how an athlete can pedal to the fullest without feeling the significant exhaustion to achieve a goal.

Oar *kayak* is one of the most common water recreation sports and has been defined as an exercise in which a person sits comfortably in an upright position on a boat with their feet parallel to the front and their hands holding the oar perpendicular to the direction of the boat's movement. To maintain speed and forward movement, the most important part of the driving force is to row not only with strength alone, but with technique and skill. Furthermore, to row continuously strong, it is important to have a stable and optimal posture. Rowing is a circular or paddling movement carried out by the upper limb and coordinated with the

rotational movement of the trunk and lower limb. When rowing the force produced by the athlete is signaled through the paddle towards the water to produce thrust, so the boat is pushed and causes speed.

According to McDonnellet Al (2012: 22) argues that the oar *kayak* movement consists of three stages: first the position when the paddle is in contact with water which consists of the phase of catch, immersion, extraction and release, second the position of the paddle blade rowing oar is in front chest with a vertical, horizontal position, part of the oar blade forward and part backward, the three positions determined by the body. One hand reaches out far ahead of the body when the other hand draws maximum force to pull the oar blade towards the center line of the body. In rowing, good physical condition can be basic and must be achieved by athletes to attempt maximum performance, including the angle of movement in rowing. To achieve optimal performance, competitive athletes must do proper and regular training in accordance with the sport they follow and the angle of motion affects the speed of the rowing, when the angle is actually carried out then the speed of the boat will go faster, in rowing the sport is very optimal angle of movement is needed, namely the angle of hand movement when rowing.

Another factor that influences the victory of a rowing athlete is speed. Speed is the ability of an athlete's organism to perform movements with the shortest possible time to achieve the best results ". According to RiaLumintuarso (2007: 41) speed is the ability to move, move on the whole body or part of the body in a short time. Speed is divided into several types, among others: "maximum speed, optimal speed, endurance, reaction, speed, agility". The speed motion element is the basic element after strength and endurance which is useful for achieving maximum performance.

Oar speed in a *kayak* is determined by 2 things, namely the frequency of the paddle and the distance of the oar, the frequency of rowing is important for the rower in order to get good performance by minimizing the pull time and glide time, the ideal time division in doing an oar based rowing phase is 22% entry, 42% pull, 5% exit and 31% recovery (Lok, 2013).The factors that influence the speed oar athletes *kayak* are (1). Stroke Displacement, (2).Water phase transfer, (3).Air phase transfer, (4).Time, (5). Time Phase in water, (6). Airborne Time Phase, (7).Characteristics of Rowers, (8).Equipment settings (*kayak* and paddle characteristics). Speed motion is the basic element after strength and endurance that is useful for achieving maximum performance. Thus the speed of paddling a boat *kayak*distance of 200 meters is the ability of a marked muscle reaction between contraction and relaxation to get to the maximum frequency in driving a distance of 200 meters.

Based on the formulation of the problem raised by the writer, the purpose of this study is to analyze the angle of hand movement when rowing which consists of three phases: the rowing phase enters into the water, the rowing phase is drawn from the water, the outflow phase out of the water, and to analyze the speed while rowing a boat *kayak* at a distance of 200 meters on the Aceh Provincial Management rowing athlete.

This research includes evaluation research using descriptive methods through a quantitative approach,Arikunto (2007:222) argues that: "evaluation research is a systematic scientific procedure carried out to measure the results of a program or project in accordance with the planned objectives or not, by collecting, analyzing and reviewing the implementation of the program objectively.However, the quantitative approach according to (Sugiono, 2010:15) is a scientific approach that aims to develop and use mathematical models, theories or hypotheses where the measurement process is a central part of this researchthe research planning is a design to answer matters related to research. Arikunto (2006:41) explains: "the design made by researchers, as a square off activities to be carried out".In arranging the research planning, the subjects include: Determine research methods, stipulates population and research samples, determine research instruments, collect data, and, analyze according to their purpose and nature.

II. METHOD

Every research certainly uses objects to be studied or termed the population. Population is the whole of individuals who are the object of research the sample is part of the number and characteristics possessed by the population (Sugiono 2009:118). The sampling technique in this study was to use total sample, which is all 6 oar athletes of the Aceh provincial board were 6 athletes consisting of 5 male athletes and 1 female athlete. Research instruments are tools or facilities used by researchers in collecting data so that the work is easier and the results are good in the sense of fast, complete, systematic. The instrument used in this study was by using a Canon 1300D camera, Tripot camera, Pluid, and stopwatch.

Data collection is conducted to obtain the information needed in order to solve problems and achieve research objectives in this research, what is meant by data collection techniques is a way used to obtain empirical data that can be used to attempt a research goal Measurement of the angle of motion and the speed of rowing a distance of 200 meters was carried out on each athlete by using a rowing device and a kayak, while the process of taking the angle of motion video was conducted in the river KruengLamnyong. The angle of movement measured is the angle of hand movement.

After the entire data collected through measurement tests,the next step is the data analysis technique.Data and information will be analyzed and interpreted continuously from the beginning of the study to

the end of the study. Data analysis procedures are carried out on the basis of three stages in accordance with what Furchan (2005:513) suggested, states that: analyzing the data that has been collected is looking back at the research proposal in order to check the presenting data plan that was initially set. Motion angle analysis techniques using the Phantom application and AutoCad Software are used to measure the angle of the hand movements and speed data analysis using the SPSS application. The schedule for carrying out data collection is May 30, 2019.

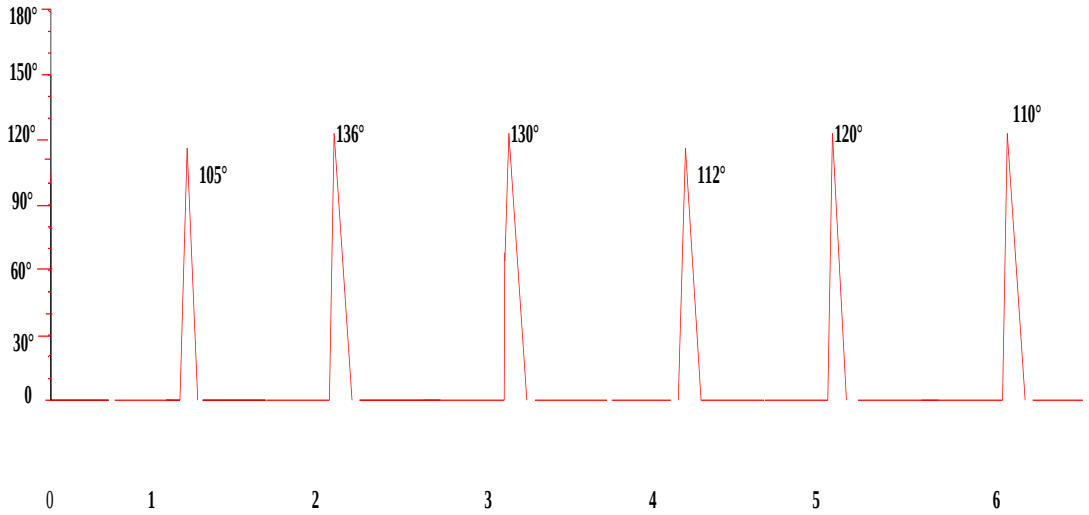
III. DISCUSSION

Based on process research conducted by oar athlete *kayak*Aceh provincial administratorthe results obtained data (1) Angle of Hand Movement, (2) and Speed of rowing distance of 200 metersAfter the data collection is done, the results of the tests conducted, then calculated and presented based on statistical techniques. The raw data obtained from the sample are then processed and reserve and presented to make it easier to read and analyze. The researcher processes the data to determine the highest value, the lowest value, the average value of the overall paddle athletes of the Aceh provincial board.

A. Corner of Kayak Boat Rowing Movement

The angle of movement in the rowing is divided into 3 stages: (1) The angle of movement when the row enters water, (2) the angle of movement is drawn from the water, (3) The angle of movement out of the water. To make it easier for readers, researchers formulate graphical features as follows:

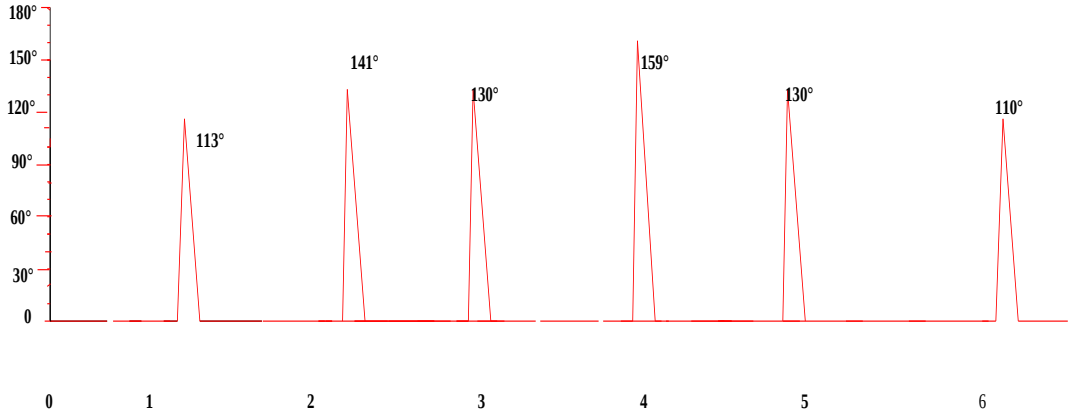
1. The angle of movement when the paddle goes into the water



Graph 1. The angle of movement when the paddle goes into the water

In the graph above shows the angle of movement when the paddle entered the water by the Aceh provincial Management rowing athlete. The first number graph shows the results of the graph from the first sample which results in a 105° hand movement angle value, in the second graph number shows the results of the graph of the second sample which produces a value of 136° hand movements, in the third graph number shows the results of sample graph three which produces the value of hand movement angle 130°, on the fourth graph the graph shows the results of the fourth sample which results in 112° hand movement angles, On the fifth graph number shows the graph results from the fifth sample that produce 120° hand movement angles, the sixth graph shows the graph results on the sixth sample that produce 110° hand movement angle value.

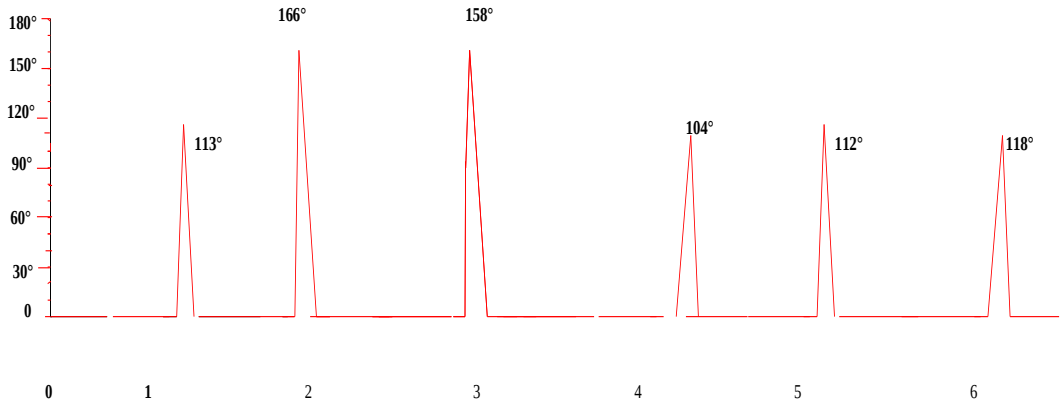
2. The angle of movement when the row is pulled from the water



Graph 2. The angle of movement when the row is pulled from the water

The graph above shows the angle of motion while the row is pulled from the water conducted by the Aceh provincial Management rowing athlete. In the first graph number shows the results of the graph of the first sample that produces a value of 113° hand movements, in the second graph number shows the results of the second sample graph that produces a value of 141° hand movements, the third graph number shows the results of the graph of the third sample that produces values angle of hand movement 139°, on the fourth graph number shows the results of the graph of the fourth sample which produces the value of the angle of hand movement 115°, on the fifth graph number shows the results of the graph of the fifth sample which results in the angle of hand movement angle 106°, on the sixth graph number shows the results graph of the sixth sample which results in a 110° hand angle.

3. The angle of movement when the rowing out of the water



Graph 3. The angle of movement when the rowing out of the water

In the graph above shows the angle of movement when the paddles come out of the water conducted by rowing athletes in Aceh Province. In the first graph number shows the results of the graph of the first sample that produces a value of 135° hand movements, in the second graph number shows the results of the second sample graph that produces a value of 160° hand movements, In the third graph number shows the results of the graph of the third sample that produces values the angle of hand movement 158°, the fourth graph number shows the results of the graph of the fourth sample which produces the value of the angle of hand movement 104°, the fifth graph number shows the results of the graph of the fifth sample which results in the angle of hand movement angle 112°, the sixth number graph shows the results graph of the sixth sample which results in a 111° hand angle.

B. Rowing Speed Distance of 200 Meters

The measurement of speed rowing *kayak* was conducted in the river KruengLamnyong which was carried out on May 30, 2019in measurement of rowing speed 200 meters was conducted from each rowing oar athlete *kayak* of Aceh provincial administrator who was assisted by the test committee. The speed measurement results can be seen in the table below:

Table 2: Rowing Speed Results Distance of 200 Meters Paddle Athletes Administrators of Aceh province

Number	Sample	Time Distance of 200 Minutes / Second	Information
1	Sample 1	01.40/ Second	
2	Sample 2	02.37/ Second	
3	Sample 3	02.12/ Second	
4	Sample 4	01.59/ Second	
5	Sample 5	01.50/ Second	
6	Sample 6	01.47/Second	

Based on the results of tests and speed was conducted by a boat *kayak* rowing athletes of Aceh Provincial Management in paddling a distance of 200 meters that produces speed values in the first sample 01.40 Seconds, second sample 02.37 Seconds, third sample 02.12 Seconds, fourth sample 01.59 Seconds, fifth sample, 01.50 Seconds , the sixth sample is 01.47 Seconds.

C. The analysis of Hand Movement Angle and Rowing Speed of 200 Meters

Based on the results of research described about the angle of movement, and speed of rowing distance of 200 meters rowing athletes in the province of Aceh in 2019, then it can be seen that the angle of movement of the speed when rowing a boat *kayak* distance of 200 meters, as in the first sample produces angles of hand movement in the position of the incoming row 105°, the row drawn 113°, and the outflow out of the water 113°and rowing out of water 113° which produces speed in rowing distance of 200 meters 01.40 seconds, the second sample produces angles of hand movement in the position of rowing 136° in, rowing drawn 141°, and paddle out of water 141° which results in speed in rowing a distance of 200 meters 02.37 seconds, the third sample produces angular hand movements at the position of the incoming rowing 130°, the rowing drawn 139°and rowing out of the water 158° which produces a speed in rowing distance of 200 meters 02.12 seconds, the fourth sample produces angles of hand movement in the position of the rowing entry 112°, rowing drawn 119°, and the paddle out of the water 104° which results in speed in rowing a distance of 200 meters 01.59 seconds, the fifth sample produces angles of hand movements in the position of the inbound row 120°, the oars are drawn 116°, and outboards come out of the water 112° which results in speed in rowing a distance of 200 meters 01.50 secondsThe sixth sample produces an angle of hand movement in the 110° entry paddle position, 105° pulled the paddle, and 110° out of the water rowing which results in speed in rowing distance of 200 meters 01.47 seconds. To make simplify reader, the researcher formulates in the form of a table as follows:

Table 3: Results of Analysis of Movement and Speed Angles

Sample	Entry position	Pull position	Exit position	Average score	Rowing speed
Sample 1	105	113	113	110	01.40
Sample 2	136	141	166	147	02.37
Sample 3	130	139	158	142	02.12
Sample 4	112	119	104	142	01.59
Sample 5	120	116	112	116	01.50
Sample 6	110	105	110	108	01.47
Average	**118**	**122**	**127**	**127**	**01.74**
Maximum	**136**	**141**	**166**	**147**	**02.37**
Minimum	**105**	**105**	**104**	**108**	**01.40**

Based on result the data analysis the research describes, the results can be obtained that the angle of motion of the hand affects the speed of rowing a distance of 200 meters when rowing a boat *kayak* distance of 200 meters, the smaller the angle of motion produced, the greater the speed of the paddle, the vice versa the greater the value of the angle of motion produced the more slow pace of the boat when sliding.

IV. CONCLUSION

Based on the results of research and discussion that has been done by researchers about the analysis of the angle of hand movements, and speed of rowing distance of 200 meters rowing athletes administrators of the province of Aceh in 2019, then, the results can be obtained that the angle of motion affects the speed when rowing a boat *kayak* distance of 200 meters, as in the first sample produces a 110 ° hand movement angle that results in speed in rowing a distance of 200 meters 01.40 minutes/ secondThe second sample produces a 147° hand movement angle and produces a 200 meter rowing speed that is 02.37 minutes/second, the third sample produces a 142 ° hand movement angle and produces a 200 meter paddling speed that is 02.12 minutes/ second, the fourth sample produces a 142° hand movement angle and produces a speed of 200 meters rowing distance that is 01.59 minutes/second, the fifth sample produces a 116° hand movement angle and produces a 200 meter rowing speed that is 01.50 minutes/second, the sixth sample produces a 108° hand movement angle and produces a 200 meter rowing speed that is 01.47 minutes/seconds, subsequently it was concluded that the smaller the angle of motion produced from the rowing motion, the greater the speed at which to row a boat *kayak.*

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