

Development of Test Speed Hand and Leg Reaction Tests in Branch Sports Branches Tarung Derajat

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Abstract— This study aims to simplify the implementation of the reaction speed test where the tools developed are simplified because remembering the measurement tool of the reaction speed test that was previously very minimal procurement for the tool is also a high price in the financing of the tool, so that with this research can help trainers in carrying out physical conditions tests specifically in the reaction speed test instrument in the Tarung Derajat sport. The research method is a development research method. This research was conducted through 3 stages of research, namely pre-development, development and application in different groups. The study population was Tarung Derajat athletes from POPNAS, POMNAS, Pra-PON North Sumatra. The sampling technique uses purposive sampling and there are 20 people. The control group was 20 Pra-PON athletes. The instrument used was the data analysis technique of the Hand & Foot Speed Reaction tool using the T test. The results of the study concluded: with the development of a tool simplified to the hand and foot reaction speed test it is expected that there will be the same results as the developed instrument so that the tool can later used by trainers and KONI district cities in terms of physical condition tests specifically on the test of the reaction speed of the hands and feet of Tarung Derajat Athletes.

Keywords: *recruitment, speed and reaction, leg and hand*

I. INTRODUCTION

All sports that are dominant physical activity really need Speed Reactions, which means that the time taken between the emergence of stimulus or stimulation from the beginning of the reaction. The reaction speed is the shortest time needed to provide a kinetic answer after receiving a stimulus. Reaction speed is very much related to reflex time, movement time and response time. The reflex time is different from the reaction time, the implant reflex is delivered from the sensory nerve to the center of the reflex, then to the efferent nerve, then to the elector, thus in reflex there is no thinking process at all. Whereas at the time of the reaction there is a thought process. Motion time is the time needed from the moment the move is carried out until the end of the movement. Speed Reactions are

needed at the time of the match so that during the match remain powerful while while training can complete the given training tasks optimally. The benefits of this research are. The results of this study are expected to increase knowledge of the development of hand and foot reaction speed test equipment at the Tarung Derajat North Sumatra sport branch and also simplify the use of technology media so that trainers in the regions can conduct tests at affordable prices. The results of this study are expected to make it easier to calculate the results of the hands and feet reaction tests on Tarung Derajat sports by utilizing simple technological development.

Teachers as educators must try to develop their competencies in order to achieve educational goals [1]. Physical education in its understanding is a process of education utilize physical activity to produce holistic changes in individual qualities, both in terms of physical, mental, and emotional. Education the body treats the child as a whole, total being, rather than just think of it as someone who is separate physical and quality mentally [2]. Schools are one place in shaping character [3]. On the other hand that training activities are a fundamental factor if you want to get the peak performance. This condition forces anyone who wishes to do performance training exercises to understand the training procedures themselves in order to achieve the expected goals [4]. Education is a basic need of every human being to ensure his life to be more dignified [5]. Improving the quality of human resources is a serious problem from every country including Indonesia [6].

There are several weaknesses in conducting a reaction speed test using a WBR tool, namely; the use of equipment that is difficult to use for WBR equipment is also the procurement of expensive equipment so it is difficult for trainers in the city district and also KONI Kota for the test equipment. The impact of these weaknesses is often the problem in performing a reaction speed test specifically on Tarung Derajat sports.

Various studies have been carried out to improve the efficiency and effectiveness of the speed of reaction of hands

and feet with the use of simple tools as a tool to develop a hand and foot reaction speed test.

It is from these problems that underlie the need to develop a hand and foot reaction speed test tool called hand and foot speed reactions. This study aims to produce a hand and foot speed reaction test tool by utilizing a simple tool based on a microcontroller. Hand and foot speed reactions is a tool for calculating the speed of reaction of hands and feet by utilizing a microcontroller as a tool that will later enter the system that will be displayed on the LCT to display the final results of the hand and foot reaction speed test in a combat fighting degree.

II. METHOD

This research was conducted at the Medan State University Stadium in December 2019. The sample of this research were 30 people with purposive random sampling technique. The research method of Research and Development (R&D) of the Borg and Gall model [7], is a research method used to produce certain products and test the effectiveness of the product. This research instrument uses: using a closed and open questionnaire. Closed questionnaire is used to determine the level of effectiveness and efficiency of the product. Open questionnaire is used to find out the weaknesses and nonconformance of the tools to the needs of the product and is used during the Focus group discussion (FGD). Data analysis techniques used in this study are: (1) needs analysis using percentage techniques to see the level of product needs, (2) To measure the effectiveness and efficiency of the product using as a validity test with FGD techniques by 5 experts namely test and measurement experts, expert Tarung degree trainers and IT experts. (3) to see the effectiveness and efficiency of the model 20 stage 1 trials are used and 20 group 2 trials are used using a questionnaire.

III. RESULTS AND DISCUSSION

From the needs analysis that has been done on 35 respondents consisting of administrators, trainers and athletes from some Pengcab, so that it is obtained 89% of respondents said that they had taken measurements of the reaction speed of the hands and feet and 11% never did. Then 56% of respondents said they had done a reaction speed test using digital equipment and 44% did not. Furthermore, respondents said 100% of respondents need digital equipment to develop hand and foot reaction test kits. Then 59% of respondents answered measurement using digital tools have better accuracy than manuals and 41% disagree. Next 92% of respondents said that if there was a digital tool to measure the reaction speed the respondents wanted to use it and 8% did not want to use it. The results of the needs analysis can be illustrated in the diagram below:

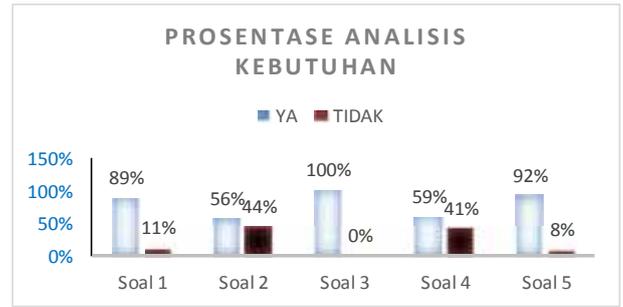


Fig. 1. Percentage Needs Analysis



Fig. 2. Image of implementation of hand and foot speed reactions

The initial product design Hand and foot speed reactions can work to guide the mechanism of implementing a reaction speed test. The working system of the tool starts with the availability of tables and chairs as supporting tools for implementation. To record the results of the reaction speed of the hands and feet the sample must press the button to start and after the signal is issued with an audio and visual signal the sample presses the stop button. Furthermore, the results obtained will be displayed on the LCD with the results that have been done by the sample.



Fig. 3. Percentage diagram of the expert results

Hand reaction test: the athlete sits on a bench in a relaxed manner in front of which a hand reaction speed counter is available on the table. Furthermore, it enters the implementation stage where the athlete must press the first button to the second button as quickly as possible and is started by the signal of the "tut" sound and the light that lights up on the start button. Furthermore, in the process of calculating the time when the first button is pressed, then after a while the light will appear from the button or the sound "tut", and automatically the time immediately activates and when the subject presses the second button automatically also stops time, then the next time obtained subjects directly listed on the stopwatch that has been modified. Conducting a standing

subject test in a relaxed manner in front of or in the hand has been provided with a foot-reaction speed meter on the floor. Furthermore, it enters the implementation stage where the athlete must press the first button to the second button as quickly as possible and is started by the signal of the "tut" sound and the light that lights up on the start button. Furthermore, in the process of calculating the time when the first button is pressed, then after a while the light will appear from the button or the sound "tut", and automatically the time immediately activates and when the subject presses the second button automatically also stops time, then the next time obtained subjects directly listed on the stopwatch that has been modified.

The results of 3 validation experts showed that the shuttle tools design was well categorized and could be continued

The design of the hand and kiki reaction speed test kits is a digital system tool that helps the tester take measurements of the athlete. Utilization of digital tools in measuring the performance of athletes in conducting reaction speed to show a high level of objectivity [8]. The initial design of hand and foot speed reactions can be used as a tool to measure the speed of reaction of hands and feet in a fighting sport with a good degree of objectivity. Calculation results will be displayed on the LCD when the sample is finished carrying out the reaction speed test series. Hand and foot speed reactions have the advantage of not needing to use large hardware and can be done alone with equipment that is easy and inexpensive. It is believed that hand and foot speed reactions are the best solution for sports players who want to know the level of speed of the hands and feet reactions that athletes have.

IV. CONCLUSION

This paper explains the design of a microcontroller based hand and foot reaction speed test tool using a simple tool. The initial draft design illustrates the mechanism of action of the reaction speed from the beginning to the end of the test. The results of the initial draft are as follows; catches start and stop buttons connected to the microcontroller and then automatically channeled to the LCD monitor by hand and foot. Furthermore, from these results a detrajat fighter athlete known the level of reaction speed it has

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