Development of Tools Speed of Blow Reaction Android-Based in Pencak Silat

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Abstract: *The purpose of this research is to make a training tool for the speed of reaction in pencak silat. The sample in this study amounted to 60 people coming from the Sports Coaching students of Medan State University* The small group test involving 20 students. The large group test involving 40 students. This research uses the Research and Development Method. Research and Development Method is a research method used to produce certain products, and test the effectiveness of these products. Pencak silat's reaction speed training equipment is valid according to experts' assessment and has been reliable for use in the training process as evidenced by the results of the consistency of the results of the test, this tool has the benefit of the user in terms of the application of technology in sports and the development of martial arts sports performance going forward.

Keywords: Speed, Blow Reaction, Android, Pencak Silat

1. Introduction

Pencak silat is a sport that often promotes the name of Indonesia in certain events, such as the 2015 Pencak Silat World Championship held in Thailand, then the 2018 Asian Games in Indonesia, in these two events Indonesia won the overall championship. To become a martial arts athlete, the appearance of a qualified fighter, is required to master a variety of basic techniques that play an important role, such as : a) Steps and step patterns, b) The attitude of the development tide, c) Election technique, d) Attack technique, e) Drop technique and, f) Locking techniques, also supported by physical as well as tactics and good mental [1].

Pencak silat is a sport that has its own characteristics of movement and technique. Basic movements such as hitting, kicking, dodging, or avoiding must be properly and intensively trained. The basic movement is a combination of a performance supported by excellent physical condition. Pencak Silat is the result of Indonesian human culture, to defend / maintain existence (independence), and integrity to achieve harmony in life in order to increase faith and piety in God Almighty [1].

Technique is a process of movement and proof in practice as well as possible to complete a definite task in sports. In addition, the technique is the most efficient and simplest way to solve physical obligations or problems encountered in matches that are justified by regulations. The basic technique is a technique in which the process of motion in doing it is fundamental, the movement with simple and easy conditions[2]. Meanwhile, in another opinion argues that the basic technique is the mastery of early-level techniques

consisting of movements of the motion process, are simple and easy to do[3]. Based on this opinion, it can be concluded that, the basic technique of pencak silat is a basic form of technique that is still simple from the actual implementation of the game.

The technical elements required by fighters in the dueling categories include: attack techniques (arms and legs), and defensive techniques (arms, legs, and falls). The techniques that need to be developed in pencak silat include: (1) attack techniques, (2) falling techniques, (3) locking techniques, (4) defensive techniques, (5) tide and development attitudes. Based on the opinions of some pencak silat experts above, the elements of pencak silat techniques include: (1) stroke techniques, (2) kick techniques, (3) falling techniques, (4) locking techniques[4].

Researchers conducted observations on Pencak Silat subjects at the Faculty of Sport Sciences, Medan State University and several Pencak Silat Clubs in Medan for 2 months and found that in general the form of training to improve the basic techniques of pencak silat in each college was carried out with traditional exercises and with improvised training tools. The technique that athletes often use when competing is a punch.

The results of data analysis conducted on the specialization student of the martial arts sport at the Faculty of Sport Science, Medan State University found that 100% needed a technique in the competition, 100% said they needed media to practice, 90% said they needed to practice the speed of punch reaction. , 85% said that training media need to be combined with technology, 85% said they needed a speed reaction training media that could be used in an exercise program, and 70% said an Android-based speed reaction

training media was needed. From the results of the needs analysis it can be concluded that as long as they are athletes they have never used any training facilities to improve the reaction of pencak silat using technology-based tools and require an exercise media reaction speed of pencak silat based on android.

Based on the above problems researchers have thought to make a tool for training tools that can increase the speed of blow reactions in pencak silat.

2. Research Theory and Method

The subjects who were targeted in this research of the development of the training tools for reaction to martial arts training were students of sports training in the Faculty of Sport Science, State University of Medan. The sampling technique is by purposive sampling. Based on this technique, a total sample of 40 people was obtained. Research time for tool design is carried out for 3 months from August to October 2019. This study uses the Research and Development. Research and development, was one process or steps to develop a new product or improve existing products, that can be justified [5]. In this research the development is focused to produce a product of the reaction speed training tools martial arts punches.

3. Design of Product

There is a microcontroller at the top of the tool as a place to enter commands according to the wishes of the trainer via software on smartphones with Bluetooth as a wireless link. In the application software there is a dialog box to set the point of level, punch, time and distance.

1) Dialog Box of Level

a. Dialog Box of Level 1.
How to get points at level one, you have to hit one target in the form of lights then the next target will appear randomly and be hit again, and so on. The value of points gained each time hitting a target is worth 1 point.

b. Dialog Box of Level 2.
How to get points at level two, you have to hit two targets at once in the form of lights then the next target will appear randomly and be hit again and so on. The value of points gained each time hitting a target is worth 1 point.

c. Dialog Box of Level 3
How to get points at level two, you have to hit three targets at once in the form of lights then the next target will appear randomly and be hit again and so on. The value of points gained each time hitting a target is worth 1 point.

2) Dialog Box of Punches

When time starts running the indicator lights on each target will turn on and when the time has run out then the indicator lights will turn off.

3) Dialog Box of Time and Distance
When the tool starts, the time will go backwards. the time is set according to your needs. This time setting limit is also used as a controller for automatic shutdown. The distance between the tool user and tool is adjusted as comfortable as possible.

The display applications on Android can be seen in the image below.

Figure 1: App Display on Android Smartphones

Note:
On button: the ON button functions as the ENTER button, which is the command command button to send input that has been entered in the application to the device.

Play button: this button functions as a trigger for the tool to operate after all the commands have been completed.

Off button : this function as to forcibly stop the operation of the tool.

Reset button: the function of this button is to serves as a result of the cleaning operation of the previous tool.

4) Tool Operating Procedure

The following stages of using the tool can be seen below ;

4.1. Connect the adapter to the current source, then press the ON button on the side of the device, open the application on the smartphone and then connect the device via Bluetooth. After that, press the ON button on the application display then input the numbers in the column level as desired. Target will move randomly if the target gets the right hit. The green light will turn red if the punch is right.

4.2. Arrange numbers in the time column. There are 4 digit numbers namely 2 digits for minutes and 2 digits for seconds. Enter the number command for units of minutes (can be up to 99) then enter the number command for units of seconds (can be up to 59).

4.3. Press the play button on the application to start operating the device. The tool will operate simultaneously with the countdown time and targets that are lit according to their level. Time is running simultaneously on the device and application as well as results or points will

appear together on the device and application in real time.

4.4. Targets that are stressed or hit will change color from green to red while increasing points on the hit screen and the results column in the application. Points are added according to the number of targets that live on each level.

4.5. After the time runs out, the LED light on the target will automatically turn off and what is still alive is a 7 segment LED screen that shows the level, number of hits and the time that has been at zero. When time is up the display in the application will display the results that have been obtained and the current level.

4.6. To restart, press the ON button to re-enter the desired command. The OFF button functions to cancel the command / tool that is operating and return to zero in every column except the level, the RESET button is used to reset all commands to zero in each column.


Figure 4: Display of the Pencak Silat Punch Reaction Speed Training Tool that has been Made
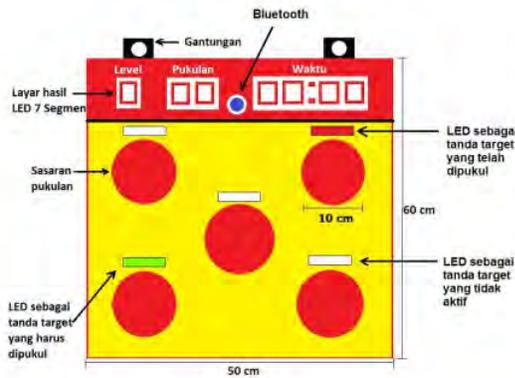
Figure 2: Front View Tools that will be Connected to Applications on Android

Figure 5: The Way of the Device Works by Hitting the Green Light that is on
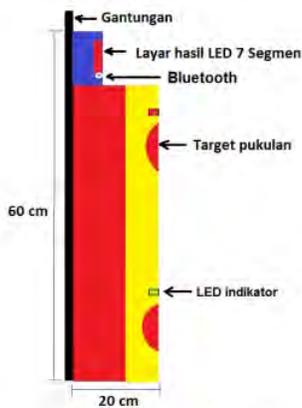
Figure 3: Side View of The Tool
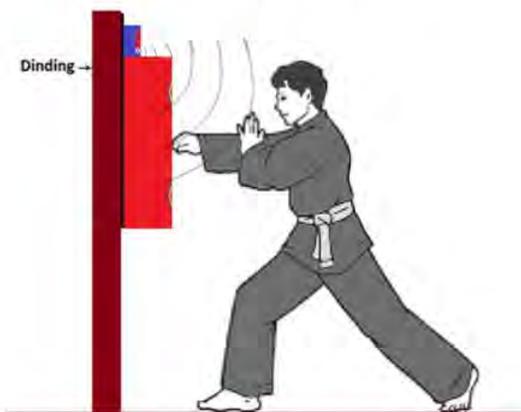
Figure 6: After Making the First Hit, the Next Green Light will Flash Randomly

4. Discussion

Before test 10 the use of tools on the sample, the equipment validation was carried out by experts consisting of sports science experts, coach of Pencak Silat and electronic experts. The average value of the percentage of product design validation by the three experts is 82.3%. Based on the description in the classification table of percentage validation, the validation value is in the range of 70.1% - 90% then it can be said that the design of the training tool speed of the pencak silat reaction is categorized as good and ready to be used at the trial stage after repair [6].

This tool has a foot foundation with a height of 210 cm and a width of 64 cm. Legs made of angle iron foundation holes, each hole has a distance of 5 cm is used to determine the elevation of the target board is locked in one of these holes using size 7 mm long bolt 5 Inches. Mast foot position during use is propped against the wall so strong and did not falter and fall when exposed to blows.

Target board has a size of 70 cm high and 60 cm wide, 17 cm thick. Target board material made from plywood boards with a thickness of 12 mm. Target board has three screens that display a level, points and time. There are 5 pieces of the target on the target board with a diameter of 9 cm, white color indicates that the target is not active, the green color indicates that the target life and must be struck, the red color indicates that the target has been hit.

After being validated, a trial of 8 devices was carried out. Then the sample is given an instrument to assess the assessment and evaluation tools. The percentage value testing by the subject is of 77%.

Reaction speed has to do with the ability to punch straight. this is in line with research that has been done. there is a relationship between the speed of reaction with the ability of straight books in extracurricular students of SMK Negeri 1 Kendari[7].

After a small group trial, the tool testing was carried out on a large group of 40 samples. Having tested the athletes are given instrument to assess the assessment and evaluation tools. The percentage value testing by the subject is equal to 87%.

Validation and evaluation is done by showing a video documentation of test results to the expert, the expert will provide an assessment and evaluation through the instrument that has given researchers.

The results of the validation of the tool by the tool were also carried out by other researchers in the development of manual punch strength measuring products in the Pencak Silat sport [8].

The reaction speed is one part of the speed component. Speed depends on several factors that influence, namely strength, reaction speed, and flexibility. The speed of the hand's reaction is very important in order to provide acceleration to blow attacks in martial arts [8].

Speed coaching in theory means the ability to move a limb, leg or an arm or a static portion of the body lever even the whole body with the greatest speed that is able to do [9].

Aids in training the blow reaction speed are very necessary because with the teaching aids, the material will be more easily understood by students [10]. Teaching tools can also be defined as training achievement tools. In achieving the objectives of the exercise, we need tools that can achieve the objectives of the exercise. By using assistive devices, basic movements in martial arts can be carried out including manipulative movements, movements that use coordinated limbs combined with visual modalities and touch modalities [11].

5. Conclusion

The tools reaction speed drills martial arts blow was valid according to assessment of experts and has been reliable for use in the training process is evident from the results of testing the consistency of the results, the tool has a usefulness to the user of the application of technology in sport and the development of martial arts sporting achievements in the future. With these tools in addition to giving students experience in the lecture can also be used by coaches martial arts athletes who want to enhance achievement through these tools. In addition, the drafting of this tool could be a reference to be developed in many martial arts that use punches, especially for components of the reaction rate.

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