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Development of Training Aids (Remote Control and Headset) for Tunanetra Sprint Athletes

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***Abstract*-Constraints faced when becoming a guide is to communicate technical training with tools, collaburation and excelation with athletes, and if there are health problems or injuries to the leg muscles it will not be possible to accompany athletes in training. All problems encountered step by step can be overcome, and all of them are done manually so it takes a long time. But the problems that occur remain an obstacle so that they are less than optimal when doing exercises (kolaburasi, accelerations, communication during training in the form of movement and sound codes). The purpose of this research is to find out and get information about "making the development of training aids (remote control and headsets) for blind sprint athletes as direction controllers when running sports training programs. The validation presentation of the questionnaire that was distributed to the sample shows that 94%-96% of them admit that the training aids (remote control and control) meet the criteria. Collaboration of motion acceleration, communication is one of the problems that often accurs, with the remote communication control has been standardized so that athletes can easily remember and respond to existing information making it easier for athletes to make decisions. This technology will act as a companion eye that can give a warning if an error occurs in the safe position of the visually impaired. At first the position of the blind athlete's hand. With the use of remote control the athlete is free to do exercises and techniques that have been mastered without worrying about the runners (guide).**

Keywords: component, remote control, headset, sprint, blind

I. INTRODUCTION

In Indonesia, the development of blind athletes equipment is still underdeveloped, perhaps because our country does not yet have sophisticated technology and sports experts do not collaborate with technology experts.

Loss of ability to retrieve visual information or better known as Blindness often causes obstacles in the development of environmental orientation and motor processes that make each delay will make decisions. And this is often associated with Using the Template

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In accordance with the facts in the background above, communication is one of the problems that often occur, with the remote control and headset communication has been standardized so that athletes can easily remember and respond to information so as to facilitate athletes in making decisions. The researcher's offer is a solution that is developing a tool to overcome the problems experienced by blind athletes in the 100 meter Sprint sports branch.

The research issue is creating "Development of Training Aid (remote control and headset) For Blind Sprint Athletes".

As stated by Sutrisno (http://digilib.uinsby.ac.id accessed on February 19, 2019) information and communication technology (ICT) as part of science and technology (science and technology) in general are all technologies related to the collection, collection (acquisition), processing, storage, dissemination and presentation of information.

In essence, technology is not just a product of science and its findings in the form of machinery, aircraft, reactors, or other physical facilities are all sophisticated, but also includes the organizational system, social structure and power that crossed it. According to Kunto Wibisono: "Technology is the result of the systematic application of science, as an empirical rationalistic set of various supporting components, with the intention of controlling or controlling symptoms economically".

According to Daniel P. Hallahan, James M. Kauffman, and Paige C. Pullen (2009: 380), stated "Legally blind is a person who has visual acuity of 20/200 or less in the better eye even with correction (eg, eyeglasses) or has a field of vision so narrow that its widest diameter subtends and angular distance is no greater than 20 degrees. "(http://repository.unisba.ac.id accessed on 19 February 2019), the definition can be stated that blind children is someone who has visual acuity of 20/200 or less in the eye / vision is better after correction (for example glasses) or has a field of vision so narrow with the widest diameter has a viewing angle of no more than 20 degrees.

Blindness is essentially a condition of the eye or sense of sight because something does not function as it should, so that it has limitations and or inability to see.

The research process is carried out in various ways according to the needs needed, directional control devices for blind athletes in the sprind athletic sport that is by using a series of special digital devices equipped with remote control and sound sensors so that direct results can be known from the remote control by athletes. The use of this tool is also facilitated simply by pressing the button on the remote control, the blind sprind athlete is fully controlled by the driver using the remote control, starting from the moment of starting to the finish line.

II. METHOD

This research uses research and development methods research and development is a research method used to produce certain products, and test the effectiveness of these products. To be able to produce certain products used research that is needs analysis and to test the effectiveness of these products in order to function in the wider community, research is needed to test the effectiveness of these products (Sugiyono, 2017: 407)

The study was conducted in 3 (three) places, namely 2 (two) Yapentra SLB-A schools and Karya Murni SLB-A and 1 (one) North Sumatra NPC blind visual sprint athlete. The research procedure of developing training aids (remote control and headsets) in blind sprint athletes adapts the steps written by Sugiyono (2017: 408). The following is a picture of the research steps:

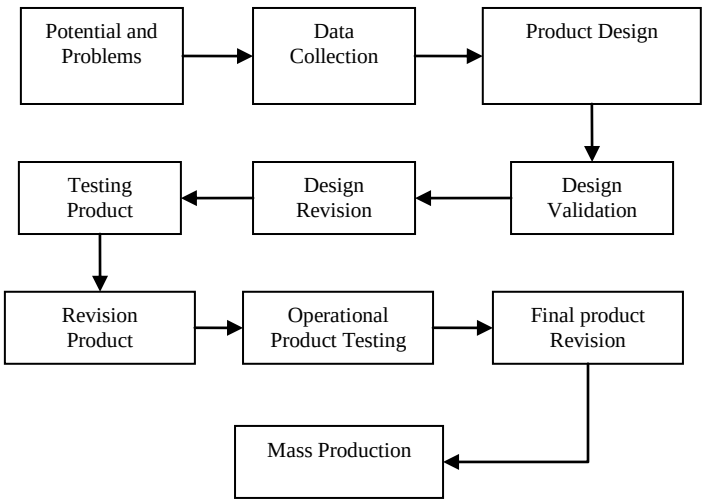

Fig. 1. Steps for using the Research and Development (R&D) Method, Sugiono (2017: 408)

In this research development data analysis technique was used with quantitative descriptive analysis techniques with percentages. This technique is used to obtain quantitative data analysis obtained from questionnaires. The data processing formula of questionnaire distribution per test subjects is as follows:

Preliminary research was conducted to obtain a needs analysis. The observations made in the study, researchers saw that sprint athletes and trainers / guides experience problems of motion collaboration, acceleration, and communication while doing training.

The analysis used is descriptive analysis with the aim to determine the needs of athletes or guides to the obstacles encountered during the training process. Then the formula used is (Sudjana: 466-467):

$$persentase = \frac{\text{Score Answer}}{\text{Score responder}} \text{x } 100\ \% \qquad (1)$$

Note: the answer (a) will be given a score of 1 and the answer (b) will be given a score of 0. All answers will be added up and distributed by the number of responder and multiplied by 100%. From these results it is known what percentage of athletes' needs for the constraints faced in the training process.

$$\text{P} = \frac{X}{X_1}\ X\ 100\% \qquad (2)$$

Information:

P = Percentage of evaluation results of trial subjects

X = Number of answer scores by test subjects

Xi = Maximum number of answers in the assessment aspect by the trial subjects

100% = Constants.

III. RESEARCH RESULTS AND DISCUSSION

Observation Results (Interview, Questionnaire, Video) to the Board, Coach, Guide, Athlete, conducted on Tuesday, March 13, 2018, Suliadi (North Sumatra Management) said that the North Sumatra National (Paralympic Committee) had built eight sports, namely: athletics, chess, weight lifting, judo, table tennis, swimming, goal ball and badminton. the addition of new sports in the (National Paralympic Committee) has long been planned.

Furthermore, the Deputy Secretary of the Suliadi (National Paralympic Committee) of North Sumatra said, until now (the National Paralympic Committee) the city of Medan has given birth to athletes with visual impairments who excel at regional, national levels, while the sports branch for blind people is fostered and developed by (National Paralympic Committee) including athletics, chess, table tennis, swimming, weight lifting, goal-ball.

Almost all branches are done manually, so that every training problem, both in terms of equipment and training evaluation is done manually. Which now is the time to find solutions to every problem must be fast, careful, and precise. Suliadi also explained about the purpose of sports coaching especially for people with disabilities is to make them more independent in carrying out their daily lives, this is the principle of training that is conducted in North Sumatra. Especially the visually impaired problems of various sports which have not much different constraints namely very limited mobility with it makes the coach must work hard to deal with these obstacles. Talking about equipment and addressing the problems faced by blind athletes are still done manually so that the training process is very limited. Not only blind athletes but almost in all branches of sports with disabilities.

One of the contested sports is the sprint number of participants, one of which is blind. For blind people sports can be considered as a channel connecting quality of life. This will not be easy, the blind will have difficulty in learning the techniques directly. Although learning can be done by utilizing the ability of the senses that function, but still when going to implement independently, feared that the risks will also be accepted. Professional guidance is needed by people who are competent as providers of appropriate material.

In this sprint sport, blind athletes are given more demands. One example is the target given by the coach, so that sprint athletes can rank best in a match. In addition athletes are faced with greater obstacles compared to other sports, such as the risk of falling, injury or injury when training and competing. The results of the interview by Deputy Secretary Suliadi (National Paralympic Committee) of North Sumatra said that there were obstacles that occur to blind athletes implementing the Intensive Training Program (PPI) of athletes faced with greater obstacles compared to other sports, such as the risk of falling, injury or injury.

Suliadi (North Sumatra administrator) also has a special copy of blind athletes, namely hoping that blind athletes in the sprint branch either during training or competition do not use a guide and that is an outside achievement, it can be achieved when integrating technology during the training process, so that blind sprint athletes don't run off course, and don't collide. It was indeed difficult and Suliadi said even though it was difficult but it was a possible thing.

Preliminary research was conducted to obtain a needs analysis. The observations made in the study, researchers saw that sprint athletes and trainers / guides experience problems of motion, acceleration, and communication problems when doing exercises.

Results of interviews with NPC administrators, trainers / guides and athletes. During training, communication, collaboration and acceleration during training, and still become an obstacle during training. From the needs analysis that has been carried out on 10 blind people, 90% had competed in the blind sprint competition, 90% had constraints during sprint training, 90% they had the same constraints during training, 80% they had never received assistance with assistance. technology. 100% they want they want to get the tools to overcome the obstacles they experience during training.

The analysis used is descriptive analysis with the aim to determine the needs of athletes or guides to the obstacles encountered during the training process. Based on observations, interviews and needs analysis above, it can be concluded that the management, trainer / guide, especially athletes, really want to get training aids (remote control and heatset).

The aim of this study is to develop training aids for blind sprind athletes with remote control and headsets that can be used as a means of athletic training. This development will support sports achievement specifically in the sprind branch of blind athletes. The product in this research development seeks to make remote control devices and headsets using technological media, but it can also be used for other athletic sports related to the direction of motion in other athletic branches. Then this product is expected to be the latest innovation on direction controllers that are more effective and efficient when used for training or competition, and can be used as a solution to the problems in the training process and competition.

The first test is done after the initial product or the development of training aids (remote control and headsets) have been observed, corrected and declared worthy to be tested by experts. The first test consists of 9 (nine) experts, namely 3 sports experts, 3 expert trainers, 3 IT / Technology experts. The results of evaluations by experts refer to indicators that have been prepared previously, which serve as a reference to test whether the product is suitable for use or not. The results of the evaluation of the design model that has been made by the trainer are as follows:

- From the aspect of effectiveness states that the remote control is easy to use in directing blind athletes, and can describe mentoring to blind athletes, provides accurate direction to blind athletes and reduces the training budget in the mentoring process, while the percentage of sports expert validity is 84.00%, which means that the tool The remote control has the effectiveness of a product worth using.
- From the appropriate aspects, namely facilitating the process of movement exercises, reducing the level of communication errors, collaburation, acceleration. As well as interesting in its use and illustrate the progress of technological science as for the percentage of sports expert validity is 84.00%, which means that the remote control tool has the appropriate product to be used.
- From the construction aspect, the referring code used is appropriate, the placement of the referring device on hearing is appropriate, the remote control is appropriate, and the control key is appropriate, while the percentage of sportsman validity is 82.67%, which means the remote control device has construction product worth using.
- From the design aspect, that is, the design is easy to understand, the button placement is appropriate, interesting to use and motivating in its implementation, the remote control and hearing are appropriate. As for the percentage of sports expert validity is 88.00%, which means that the remote control device has a product design suitable for use.

From the results of small group tests conducted after experts evaluate the products that have been made by researchers. A small group test was conducted on athletes and guide / trainers in a total of 10 blind sprind athletes, 3 guides / trainers then the conclusion was:

From the results of small group trials on athletes and guides after sprinting using the Remote control and Headset, athletes and guides are given a questionnaire to be filled according to their own understanding. A blind person filled out a questionnaire assisted by the research team. From the results of a small trial of 10 blind athletes and 5 guide / trainers it was concluded that the development of training aids (remote control and headsets) blind sprint athletes meet the criteria to be continued in large group trials because the percentage of each aspect includes 85% - 98%.

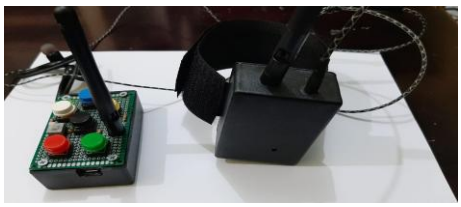

Fig. 2. Remote Control and Headset

Picture. remote control and headset tool test results, expert revisions, and validation.

As for the revised results of interviews, questionnaires, and observations during the trial are as follows:

- Buttons have different colors.
- Minimize the size.
- The headset is adjusted to the shape of the ear curve.

Revisions and improvements do not reduce the initial function but improve and improve product quality.

From the results of the trial run for athletes and guides after sprinting using a remote control and headset, athletes and guides are given a questionnaire and answered according to their own understanding. Blind athletes fill out a questionnaire assisted by a research team. From the results of a wider field test of 16 visually impaired athletes and 5 guide / trainers it was concluded that the development of training aids (remote control and headsets) visually impaired sprint athletes meet the criteria of which 94% - 98% can be continued to the next stage.

Based on the results of small group trials, revised improvements, wider group trials, revisions and improvements it can be concluded:

- In using the remote control and headset, athletes focus more on personal abilities without thinking about collaboration, acceleration and communication.
- By using a remote control and headset, athletes are more confident and more independent in sprinting activities.
- By using a remote control and headset, the guade and trainer are more focused in conveying information and are more efficient in training blind athletes who run sprint numbers by looking at personal abilities and motivations as sprint athletes run norms.

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