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Flexible Intelligent Robotic Equipment Ball Launcher (FIREBALL) as A Tool for Sports Training in Big Ball Games

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ABSTRACT

This research aims to develop a ball launcher or what is usually called a ball launcher. The researchers carried out the development of this tool so that the resulting tool could be more competitive with previous tools. Apart from that, this tool can be used in several sports, especially big ball sports. This tool has two dynamos for launching the ball and has a speed controller to regulate the rotation of the dynamo and this tool is designed to be flexible so that in big ball sports you can use this tool. The method used in this research is R&D (Reaserch and Development) using five stages, namely ADDIE. The results of data acquisition on tool assessment through a questionnaire are as follows: a. The assessment of the athlete's response obtained a result of 79.97%, including the "Good" category with the meaning "Used", b. The trainer's assessment obtained a result of 65.00%, including the "Enough" category with the meaning "Used (conditionally)". Based on the research results above, it can be concluded that the Flexible Intelligent Robotic Equipment Ball Launcher (FIREBALL) as a training aid for ball game sports obtained results of 72.49%, including the "Good" category with the meaning "Used" as a training aid in ball game sports.

INTRODUCTION

Training is the process of preparing athletes to help improve higher performance (Hanafi et al., 2019). The training process is to find out the development of several aspects that are correlated with the tasks or training undertaken, these aspects include: multilateral physical development, sports physical development, technical ability, tactical or strategic ability, psychological factors, health maintenance, injury resistance, and theoretical knowledge (Amansyah, 2019). A sports trainer should equip himself with knowledge of sports training methodology and add other knowledge and technology needed in the training and coaching process (Budiwanto, 2012), athletes will not be able or will not be able to show their abilities if they are not at their peak condition both physiologically and psychologically. An athlete also finds it difficult to improve their performance if the training model carried out is not in accordance with the development of science and technology that exists today, then combined with training methods that support the goal itself (Akhmad, 2015).

In the field of sports, the discovery of technology used is very much and varies, based on observations in the field (Nugroho, 2016a), most coaches still use makeshift tools. Coaches still help the training process with simple tools, such as in football and handball, training goalkeepers still uses the training process with the help of the coach himself (Hendriko et al., 2019), there are also those who already use ball launchers but are still imperfect and are still operated manually (Nugroho, 2016).

The application of technology in large ball sports (Rizal et al., 2018) such as football and handball that help coaches and players improve their performance on the field during training, one of which is FIREBALL technology. FIREBALL (Flexible Intelligent Equipment Ball Launcher) itself is designed to help coaches and players during the training process to be more varied. Therefore, this tool will be a solution to reduce boredom during the training process, especially goalkeeper training.

In the research on the development of the FIREBALL (Flexible Intelligent Equipment Ball Launcher) tool to make it easier and more efficient for athletes and coaches. This tool is expected so that coaches do not train manually and are also more varied.

FIREBALL is a product whose focus is on the right and left dynamo for the ball launcher, with the way the ball is inserted into the hole between the right and left dynamo repeatedly. The materials used are as follows :

1) Iron
2) Dynamo 2
3) Wheel 4
4) Throwing Wheel 2
5) Cable
6) Power Supply
7) Speed Controller

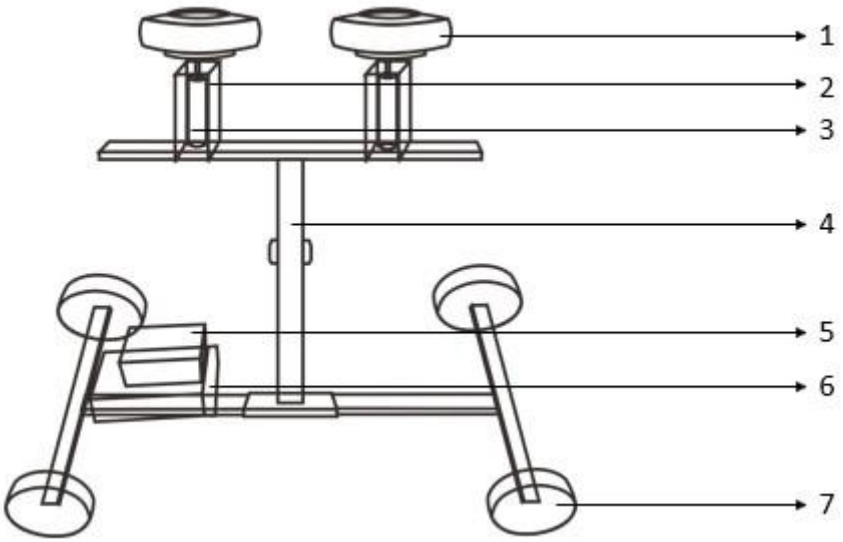

Figure 1. Parts of FIREBALL

RESEARCH METHOD

The research currently being conducted is a type of development research. The method used is R&D (Research and Development). (Sugiyono, n.d.) Research and Development is a research method used to conduct research to produce a product, then test the effectiveness of the product (Amali et al., 2019). Based on the statement above, development research is research that produces a product, and its effectiveness is determined by the level by providing an assessment to ensure the level of practicality, accuracy and effectiveness in its use. This study uses 5 stages, namely (Analysis, Design, Development, Implementation, Evaluation) is a learning design developed by Robert Maribe Branch (Nur Sa'adah et al., n.d.).

The population in this study was the Giri handball club 25 male and female athletes as a field trial. This study was conducted on February 25 - March 10, 2024 which took place at SMAN 1 Dryorejo. Data collection in this study used a questionnaire with several statements about the feasibility and ease of using the FIREBALL (Flexible Intelligent Equipment Ball Launcher) tool. The questionnaire was given to coaches and athletes as respondents in this study. The data analysis technique used to obtain the data for this study was quantitative descriptive analysis in the form of a percentage (%) assessment. While the data in the form of suggestions and reasons for choosing the analysis answers used descriptive analysis.

In data processing, the percentage is obtained using the formula from.

F=f/N x 100%

Description:

F = Relative frequency/percentage number

F = Frequency whose explanation is being sought N = Total number of data

100% = Constant

No.	Presentase	Classification	Meaning
1.	0% - 20%	Not Good	Discarded
2.	20.1% - 40%	Less Good	Repaired
3.	40,1% - 70%	Fairly	Used (conditional)
4.	70,1% - 90%	Good	Used
5.	90,1 – 100%	Verry Good	Used

The questionnaire used in this study was an assessment and response questionnaire with the following answer forms and assessment descriptions: 1. Less Agree (KS), 2. Quite Agree (CS), 3. Agree (S), 4. Strongly Agree (SS)..

RESULTS AND DISCUSSION

The results of this research are the development of FIREBALL (Flexible Intelligent Equipment Ball Launcher) to facilitate the performance of coaches to be more varied in carrying out the training process so that athletes do not get bored and to increase the enthusiasm of athletes to continue training.

Subject conditions in the field when this study was conducted on 10 athletes and 1 Giri Club Gresik Handball coach. The trial of this tool, athletes were given a trial of several balls each to anticipate being able to understand the concept of training using the media aids before entering the core training stage. The condition of the subjects during the trial carried out in the field as a whole included:

No	Rated Aspect	Score Obtained	Maximum Score	Presentase %	Category
1	Material	464	480	96.67%	Very Good
2	Design	139	200	69.50%	Sufficient (Conditional)
3	User	59	80	73.75%	Very Good
Total Score		**662**	**760**	**79.97%**	**Good**

No	Rated Aspect	Score Obtained	Maximum Score	Presentase %	Category
1	Appropriateness	13	20	65.00%	Fairly
Total Score		**13**	**20**	**65.00%**	**Fairly**

Discussion, based on the data obtained in the research "Development of the FIREBALL (Flexible Intelligent Equipment Ball Launcher) Tool" was carried out with a careful and precise analysis process, so that it can produce several things including :

- Based on the field trial, the assessment of the tool obtained a result of 79.97% in the "Good" category with the meaning of "Used" for training media.
- Based on the assessment and notes on the tool by the Handball head coach, the result was 65.00% in the "Sufficient" category with the meaning of "Used Conditionally" as a training aid media.

The categories used in this assessment are divided into several parts, including: 0% - 20% is categorized as "Not Good" with the meaning "Discarded", 20.1% - 40% is categorized as "Less Good" with the meaning "Repaired", 40.1% - 70% is categorized as "Enough" with the meaning "Used (conditionally)", 70.1% - 90% is categorized as "Good" with the meaning "Used", 90.1% - 100% is categorized as "Very Good" with the meaning "Used". FIREBALL (Flexible Intelligent Equipment Ball Launcher) is developed and designed to be used as a goalkeeper training aid in large ball sports such as handball and soccer. This tool presents several functions, namely being able to adjust the speed of rotation and the size can be adjusted for large balls. After being produced, this tool will be assessed by the trainer regarding the efficiency of the training aid against training conditions in the field. The quality of the FIREBALL tool is included in the criteria for "Can Be Used Conditionally". This statement can be proven in the results of the assessment analysis by filling out a questionnaire from the trainer, as well as an assessment of the athlete. With these results, athletes feel happy and enthusiastic when doing training using media tools. Giri Gresik Handball Coach also welcomed the presence of this aid.

CONCLUSSION

The results of the research from the assessment data of the FIREBALL (Flexible Intelligent Equipment Ball Launcher) tool are categorized as "Good" with the meaning "Used" as a training aid in large ball sports. The results of the data obtained include: a. The trainer produced 65.00% of the "Sufficient" category with the meaning "Used Conditionally", b. The athlete produced 79.97% of the "Good" category with the meaning "Used". So this tool is declared suitable for use as a training aid.

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