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Development of Mini Trampoline Equipment Prototype in DKI Jakarta Trampoline Gymnastics

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Abstract
The purpose of this study is to develop a model of mini trampoline equipment for DKI Jakarta trampoline gymnastics athletes, the main purpose is to improve movement skills in gymnastics athletes. Trampoline equipment can be used in training for beginner, junior and senior trampoline gymnastics athletes which can also be used for competitions for trampoline athletes. This research was carried out in several stages, namely the stage of obtaining initial data by making a prototype of a trampoline device, the trial stage which is all qualitative data. The main procedure during this research and development consists of five steps, namely (1) Conducting product analysis to be developed, (2) Developing initial products, (3) Expert Validation, (4) Field Trials, and (5) Product Revision, The results of this study can be concluded that movement skills on mini trampoline tools for trampoline sports can be used to (1) Improve movement skills in mini trampoline equipment of senior and junior athletes, (2) As a training facility for athletes and (3) as a means of entry-level competition.

Keywords: *Mini Trampoline Tool, Trampoline, Trampoline Gymnastics*

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INTRODUCTION

According to the origin of the word, gymnastics (*gymnastics*) derived from Greek, which means: "To explain the various movements performed by naked athletes". In the centuryAncient Greece, Gymnastics is done to maintain health and make harmonious body growth, and is not contested. New at the end19th century, the rules in gymnastics began to be determined and made to be competed. At the beginningOlympic GamesIn modern times, gymnastics is considered as a demonstration of art rather than as one of the regular sports (KONI, 2010). Artistic gymnastics is a type of gymnastics that combines tumbling gymnastics and acrobatic gymnastics to get beautiful movements (Sukamti, 2017). Artistic gymnastics is one of the gymnastics sports competed in the Olympics. Gymnastic movements are very suitable for filling physical education programs, movements stimulate the development of physical fitness components such as strength and muscular endurance from all parts of the body, besides that gymnastics has the potential to develop basic movement

skills, as an important foundation for mastering technical skills in one sport (Agus Mahendra, 2003: 1).

The jumping table is a tool used for artistic gymnastics matches. Unlike other competitions, the jumping table is contested for both men's and women's competitions, with little difference between the two. Gymnasts will do a sprint on the provided track, with a maximum length of 25 meters, before jumping to *Spring Board*. By taking advantage of the repulsion of*Spring Board*, the gymnast pointed her hand at the jumping table. The position of the body is maintained while performing repulsion (the block from the jumping table only utilizes shoulder movement) with the jumping table tool. The gymnast then performsrotasI his own body then made a landing with a sturdy body position on the other side of the jumping table. In the event of world-class gymnastics competitions, several elements rotate (*Twist*) and other acrobatic movements may be performed prior to landing. The success of the competition in this device depends on the speed during the run, the distance of the jump produced, and the amount of repulsion force that is successfully generated from the strength of the legs and hands, kinesthetic awareness in the air, the speed of rotation to make a more difficult and complicated movement (Wikipedia, 2023).

About sports performance coaching according to Surbadjah (2000: 68) there are many factors that must be considered, including clear coaching, systematic training programs, appropriate training materials and methods, and evaluations that can measure the success of the coaching process itself, besides that it needs to be considered on the characteristics of athletes who are fostered both physically and psychologically, the ability of the coach, facilities, and infrastructure, as well as environmental conditions and coaching (Tommy Soenyoto, 2004: 2)

Based on the observations of researchers, the facilities and infrastructure owned by the parent gymnastics sports organization of the Indonesian Gymnastics Association (Pengcab Persani) in DKI Jakarta are very minimal, one of which is the lack of availability of mini trampoline equipment. Based on overcome the problem, researchers need to conduct development research so that existing problems can be overcome and the results of the researcher in the form of a mini trampoline equipment development model product can be used by gymnastics organizations, sports clubs, and elementary schools that foster trampoline gymnastics in DKI Jakarta, limited sports facilities, especially mini trampolines, are expected to be a spur for coaches and parent organizations of gymnastics sports to use mini trampoline tools Modification of product manufacturing trampoline development model using practice activity suggestions.

It is hoped that this mini trampoline model product that will be developed by researchers can be owned by every parent gymnastics sports organization, sports club and elementary school that fosters DKI Jakarta trampoline gymnastics at affordable prices. In order to achieve optimal results, research is directed at the formulation of trampoline equipment development model products so that they can be used by DKI Jakarta trampoline athletes, finally the creation of a trampoline development model product.

In the preparation of products through several stages, namely the draft product selection by developing trampoline equipment products based on the analysis of needs and specifications owned by existing ones, namely Thai trampoline tools. Next is the initial draft, namely after determining the criteria for trampoline product specifications to be developed, the next stage is to make a product using the following steps: (1) Analysis of product goals and characteristics (2) Analysis of user or user character, (3) determine product specifications, and (4) Set product goals. Then the initial product validation before being tested in small-scale examinations, the initial product development of mini trampoline equipment first needs to be validated by experts / experts in accordance with this study, to validate the resulting product involves three experts in artistic gymnastics. After being validated by experts, the next is small-scale trials, wide-scale trials.

METHOD

The research method used is a research and development method. The main purpose of research and development is not to study or formulate theories, but to produce an effective product. This product is reviewed through field research in the form of trials using the product to achieve confidence where the product can be used (Sugiyono, 2008: 407). This research uses a qualitative approach model. The data collected in this study both at the stage of obtaining initial data and at the trial stage is qualitative data.

The product design developed in this study is the development of a mini trampoline model in accordance with the objectives set in the research. Data analysis used by researchers with the following steps (1) Collect all observational data in the form of field notes, method notes and discussion results notes (2) Conduct the first analysis to sort data into the first category related to product improvement, the second category related to product effectiveness and exposure (3) Conduct a second analysis in each category: First related to analysis carried out to map product effectiveness and achievement of product objectives (4) carry out the synthesis process, namely processing the entire data to formulate the final product

achievement and (5) making final conclusions, and the data can be accounted for its validity, researchers use data examination through ways (1) Diligence of observations carried out carefully and carefully in the initial product test until the implementation of usage trials, (2) Triangulation in methodological research (3) Peer examination through discussion (4) Discussion by supporting gymnast experts to get input and analysis. (5) Checking members through discussions, this effort is carried out after research and observation by step and after the work is completed to increase trust. This is an activity carried out by researchers as a way to check the final product (Sugiyono 2008: 309).

This research was conducted at Persani DKI Jakarta with respondents 3 gymnastics experts involving 20 athletes as test subjects to determine the validity of the instrument, product effectiveness trials were carried out using observations, interviews, documentation and discussions.

RESULTS AND DISCUSSION

Result

The following is a field guide used by researchers to determine the effectiveness of mini trampolines

Table 1. Field Guide to Research

No	Product at Mushroom Observed	Usage Trial Stages						
		Initial Draft	Revision	Trial Small	Rev contents	Trial Big	Revision	Implementation
1	Specifications Product	v	v	v	-	v	-	-
2	Aspects Security	v	v	v	-	v	-	-
3	Aspects Comfort	v	v	v	-	v	-	-
4	Effectiveness Product	-	-	v	-	v	-	v
5	Attainment Product	-	-	v	-	v	-	v

The Activity Guide for final product implementation activities used by researchers to achieve results

Table 2. Guide to Final Product Implementation

No	Activities	Stages of Implementation	Evaluator Team

		Process	Procedure	Product		
1	Delivery of Development Results	v	v	v	Gymnastics Expert, Equipment Expert, Gymnastics Expert and Observer Lecturer	Gymnastics Supporting
2	Final Product Achievement	v	v	v	Gymnastics Expert, Equipment Expert, Gymnastics Expert and Observer Lecturer	Gymnastics Supporting

Researchers develop mini trampoline products based on the analysis of needs and specifications owned on mini trampoline tools already have AAI tools. After determining the specific criteria for the mushroom tool product to be developed, the next stage is to make the product using the following steps: (1) Analysis of product objectives and characteristics (2) Analysis of users and users (3) Establish product specifics and (4) Set product goals. After going through the stages of the design process, the initial mini trampoline product is produced, here is an initial draft image developed by researchers before being validated by expert experts.

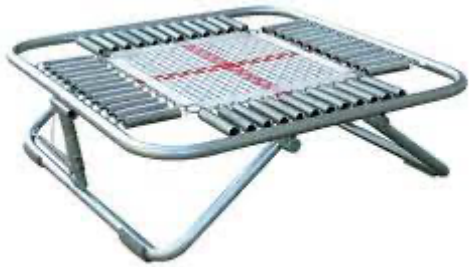

Figure 1. Mini Trampoline Preliminary Draft Products

In the Vakidation Process Researchers use 3 gymnastics equipment experts, experts use research criteria guidelines that have been determined by researchers of product revision development models following the comparison pictures of previous and post-revision products.

Figure 2. End Products Mini Trampoline

Discussion

Small Group Try-Out

After the mini trampoline development model product was validated by experts and revised, the product was tested on a small scale to 12 artistic gymnastics athletes. In small-scale trials, researchers will be observed by 3 gymnastics experts and 1 observer lecturer. This trial aims to find out and identify various problems such as weaknesses, shortcomings, or effectiveness of products when used by artistic gymnastics athletes. The data obtained from these trials is used to revise the product before it is used in large-scale trials (field trials).

Field *Tryout*

After the mattress equipment development model product was revised according to the advice of experts / experts in small-scale trials, then the product was tested in trials for use on 20 artistic gymnastics athletes and validated by 3 gymnastics experts / experts, 10 supporting gymnastics experts (as observers) and 1 observer lecturer (senior gymnastics lecturer).

Model Implementation

Model implementation is to convey the results of the development of mini trampoline equipment (from processes, procedures and products) to professional users through meeting forums or writing in journals, or in open or handbooks. To determine the success of the implementation of the model (final product), an evaluation is carried out to test the feasibility and achievement of the final product goals in the research that has been developed by the researcher.

Before this research was conducted, there was a predecessor research conducted by (Yansen, 2023) About the development of a prototype of a double mini trampoline tool which resulted in the development of a double mini trampoline tool flexi roll mattress tool. In addition, there is also other research on tools in artistic gymnastics, namely the development of prototypes of trampoline tumble track tools carried out by those who produce tumble track products that are used to improve the motion performance of trampoline tools for male and female trampoline gymnastics athletes (Jutalo, 2022).

CONCLUSION

After the model development process went through a stage that was a modification of Borg and Gall, this research resulted in a mini trampoline product and can be concluded: Mini trampoline development model products can be used to improve the mobility of trampoline equipment for male and female artistic gymnastics athletes. Mini trampoline development model products can be used as training facilities for male and female artistic gymnastics athletes. Mini trampoline development model products can be used as competitions for male and female gymnastics athletes

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