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# Improving Skills Smash Ball With R & D in Faculty of Sport Science Medan State University

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<sup>1</sup> **Abstract.** This research is focused on Development of Circuit Based Learning Model To Increase the abil<sup>4</sup> of volleyball smash technique at Faculty of Sport Science, Medan State University. Res<sup>8</sup>ch and development (R & D) is a strategy or research method is quite powerful. The research <sup>5</sup> development model is a *process used develop and validate educational product*. The research and development (R & D) approach in education includes te<sup>3</sup> steps. The chart of the steps of this study can be shown in the following figure: 1) *Research and Information Collection*. 2) *Planing*. 3) *Develop Preliminary from of product*. 4) *Preliminary field testing*. 5) *Operational field testing*. 6) *Operation product revision*. 7) *Main field testing*. 8) *Main product revision*. 9) *Product Revision*. 10) *Dissemination And implementation*. Research method used is research and development method. Based on the data obtained from the results of field trials drawn the following <sup>1</sup> conclusions: (a) Development of learning models of circuitbased volleyball smash has met the operational criteria of a learning model that is: syntax contained in the social system, prinsip reaction, support system and accompanist. b). Result of Development of learning model of circuit based volleyball smash has fulfilled the requirement of <sup>1</sup> validity, homogeneity, normality, effectiveness and model of circuit based development has been able to improve student learning outcomes of regular PJKR Faculty of Sport Science Medan State University. (3) From the experiment, volley based on the learning factor that the experiment group of posttest (new model) and the pre-experiment group (old model) smash volley ball of the experimental posttest group is the lowest score of 12 and the highest 16, whereas in the pretest experiment group, and the highest score 15.

**Keywords:** Improving Skill, Volleyball, Smash Ball.

## 1 Introduction

The use of strategies in teaching and learning activities is necessary to facilitate the learning process. Without a clear strategy, the learning process will not be directed so that the learning objectives that have been set cannot take place effectively and efficiently. Learning strategy is not only required for teachers / lecturers, students can also benefit from the strategy. For teachers / lecturers, the strategy can be used as a guide and a systematic reference in implementing teaching and learning. For students as users of learning strategies, can facilitate the learning process and accelerate the understanding of learning content. Challenges and demands in the world of education never pause, increasing and sometimes even threatening. This happens because humans never stop wanting the latest innovations in education. Innovation in education has introduced a technology-based education, where

education is progressing in teaching in giving birth to reliable human resources that are different from those in the past.

Based on the description on the background of the above problem then <sup>1</sup> this research is focused on Development of Circuit-Based Learning Model to increase the ability of volleyball smash technique at the Faculty of Sport Sciences Medan State University. Based on the background and focus of the research, it can be formulated in this research as follows: How to Develop a <sup>2</sup> Circuit-Based Learning Model To Improve The Technique of Smash Ball Technique at Faculty of Sport Science, Medan State University, especially the physical and health education department 2015 A-B class?

## 2 Theoretical study

### 2.1 The concept of developing learning models

Experts in education provide different views on defining the meaning of the model. This is due to the point of view of various experts who continue to take care of peeling from different angles of judgment but have the same goal. The model is interpreted as an object or concept used to represent something real and converted to a more comprehensive form. For example, the model plane, made of wood, plastic, and glue is the real model of the airplane. Another example is the idea of politics; public opinion is like a pendulum because it varies every period from left to right so continuously.

### 2.2 The nature of motion learning

The term learning is something that has been commonly heard in everyday conversation. In everyday conversation the term learning is always associated with an activity to read or work on problems such as math and mathematics and so forth. Learning is considered as a function when viewed is the aspects that determine or enable changes in one's behavior in the educative process. While learning is considered as a result when he sees is the final form of various experiences in educational interaction.

### 2.3 Learning model concept

<sup>4</sup> <sup>7</sup> research and development (R & D) is a strategy or research method is quite powerful. The research and development model is a processes used develop and validate educational product.

### 2.4 Model concepts developed

#### 2.4.1 Purpose and function learning

Learning according to theoretical view is a process to provide a real experience for students. There are three potentials that must be changed through learning, namely intellectual potential (cognitive), the potential of moral personality (affective) and mechanical / muscular (psychomotor) skills. Bloom's Taxonomy classifies learning outcomes into three domains: cognitive, affective and psychomotor.

#### 2.4.2 Circuit exercises

*Circuit* is a learning model consisting of several in a circle in order for the muscle groups to work sequentially from station to station. Imran Akhmad in Bompa (2013) states that Circuit training is a name of the exercise with stations conducted in circles or sequentially back to the original place consisting of 6-9 stations. Fox (1992) states that circuit training contains a number of stations where an athlete performs exercises within a certain time. A circuit consists of short circuits (6 to 9 exercises), medium (9 to 12 exercises), or length (12 to 15 exercises) over time and can be repeated several times depending on the number of exercises involved.

### 3 Research methodology

#### 3.1 Research objectives

This research is a development research which is a process or steps to develop a new product or perfected an existing product.

#### 3.2 Place and time of research

This research was conducted at Faculty of Sport Science Medan State University. The time this study was conducted during one semester that is in the range between January up to June 2017. This study only takes advanced volleyball courses with smash material.

#### 3.3 Research approach and method

a) Because this research focuses on developing a model of learning, the approach and method used in this research is mixed methods research that combines qualitative and quantitative methods.

b) Research methods used in this dissertation are research and development (R & D) method.

#### 3.4 Client goals ( Clientele target)

Target of clients or users who are targeted in this study are students majoring in physical education health recreation semester 2 majoring in physical education recreational fitness regular class FIK Unimed.

#### 3.5 Model development steps

Research development of Learning Model Volleyball Smash Training Circuit Based on the mastery of smash techniques volleyball students The physical and recreational education semester 2 class A and B regular consists of three stages, namely,

1. Phase identification and needs analysis by conducting a preliminary study
2. The planning and development stage of this model is carried out before the test runs.

3. Model test aims to determine whether the model developed feasible to use or not. The model test also looks at the extent to which the product is made to achieve goals and objectives. Based on the explanation, the research at this stage using qualitative and quantitative approach. The qualitative approach is used to complement the first objective, while the quantitative approach is used to reveal the second objective, with a *before-after (one-group pre-test and post-design)* design experiment.

## 4 Research and development result

### 4.1 Implementation of the trial first stage testing results

The first stage of testing was conducted on 15 students. Testing stage is divided into two parts. The first part of the students was tested on the old (conventional) model learning and the second part was tested on new model learning.

#### 4.1.1 Smash ball volleyball performance based on learning factor

a) Data Description

Here's a description of data from both trials:

**Table 1.** Data Description In Postest and Pretest Experimental Groups

	N	Mean	Std. Deviation	95% Confidence Interval for		Min	Max
				Mean			
				Lower Bound	Upper Bound		
New Model	15	13,20	1,207	12,53	13,87	12	16
Last Model	15	11,73	1,223	11,06	12,41	10	15
Total	30	12,47	1,408	11,94	12,99	10	16

Based on the data obtained from the volleyball smash based on the learning group that is the experiment group postest (new model) and the pretestt experimental group (old model), it was found that the result of volleyball smash skills in the experimental group postest is the lowest score 12 and the highest score 16. While in the pretest experimental group, the result of volleyball smash ability obtained the lowest score of 10 and the highest score of 15. The mean score and standard deviation in the postest experiment group were 13.20 and 1.207 respectively, while in the pretestt experiment group was 11.73 and 1.223.

a) Test Prerequisite Analysis

Homogeneity test based on study group that is group of postest experiment and experiment group of pretest done by Levene test, The result of calculation can be seen in following table:

**Tables 2 .** Wilcoxon Signed Ranking Test Based on Learning Factors.

	Last Model, New Model
Z	-2,971(a)
Asymp. Sig. (2-tailed)	,003

a Based on positive ranks.

Based on table 2 above the following will be described about the hypothesis test:

**Hypothesis:** The students' smash volleyball performance in the posttest experimental group is better than the pretest experimental group students.

#### 4.1.2 Smash ball volleyball performance based on indicator factor

a. Data Description

Based on the data obtained from the student's volleyball smash performance based on indicators such as SS, SW, PB and SA

The results of the volunteer smash volumes of the posttest experimental group on the SS, SW, PB and SA indicators have the same lowest scores: 3. The highest score on all indicators is 4. The result of volleyball smash skills in the pretest experimental group on the SS indicator has the lowest score of 3 and on the SW, PB and SA indicators the lowest score of 2 and the highest score for all indicators of 4 except the SA indicator has the highest score of 3..

b) Test Prerequisite Analysis

To prove the significance of the application of learning media development in terms of each SS, SW, PB and SA indicator on volleyball smash performance, it is necessary to test statistically with related t-tests. But before the requirements to be able to perform these calculations, it must be done prerequisite analysis test that is homogeneity test and normality test.

Homogeneity test based on learning group that is group of posttest experiment and pretest done by Levene test, The result of calculation can be seen in following table:.

**Tables 3 .** Homogeneity Test of Variance by Indicator.

	Levene Statistic	df1	df2	Sig.
SS	15,740	1	28	,000
SW	,370	1	28	,548
PB	1,799	1	28	,191
SA	,924	1	28	,345

Ho: There is no difference in variance between groups

From table 9 above shows that the significance values for SW, PB and SA indicator are 0.548, 0.191 and 0.345, respectively, those values are greater than the significant 0.05 level. This indicates that the SW, PB and SA indicators are good at both the posttest experimental group and the pretest experimental group had a homogeneous data variance, whereas the SS indicator had a significance value of 0,000 and the value was less than 0.05, so that the SS

indicators in both the posttest and pretest experimental groups did not have homogeneous data variances.

c) Hypothesis Testing by Indicator

Based on the prerequisite analysis test indicates that the SS, SW, PB and SA indicators do not meet the prerequisites, the calculations for paired samples on those indicators use nonparametric statistical tests, precisely the Wilcoxon marked rank test. The results can be seen in the following table:

**Tables 4 .** Wilcoxon Signed Test Two Samples by Indicators Based on positive ranks

	SS_ML	SW_ML	PB_ML	SA_ML
	SS_MB	SW_MB	PB_MB	SA_MB
Z	-2,236(a)	-1,633(a)	-2,271(a)	-1,890(a)
Asymp. Sig. (2-tailed)	,025	,102	,023	,059

**Hypothesis 1:** Student volleyball smash performance on SS indicators in the posttest experimental group was better than in the pretest experimental group.

From table 11 it can be seen that for the SS indicator the significance value is 0,025. Since this hypothesis test is a one-tailed test, then the value must be subdivided 2 ie  $0.025 / 2 = 0.0125$  and the value of this significance is smaller than the significance level of 0,05, then reject  $H_0$  and accept  $H_a$ , which means Student volleyball smash performance on SS indicators in posttest experiment group is better than students in the pretest experiment group can be accepted. Hence hypothesis 1 has been tested for its truth.

**Hypothesis 2:** Student volleyball smash performance on the SW indicator in the posttest experimental group was better than the students in the pretest experimental group.

From table 11 it can be seen that SW indicator has a significance value of 0,102. Because this hypothesis test is a one-tailed test, then the value must be subdivided 2 ie  $0.102 / 2 = 0.051$  and the value of this significance is greater than the significance level of 0,05, then accept  $H_0$ , which means Performance smash volley students on the SW indicator in the posttest experiment group did not differ from the students in the pretest experimental group were accepted. Thus hypothesis 2 has not been tested.

**Hypothesis 3:** Student volleyball smash performance on PB indicators in the posttest experimental group was better than in the pretest experimental group.

From table 11 it shows that for the PB indicator the significance value is 0,023. Because this hypothesis test is a one-tailed test, then the value must be subdivided 2 that is  $0.023 / 2 = 0.0115$  and the value of this significance is less than the significance level of 0,05, then reject  $H_0$  and accept  $H_a$ , which mean student smash performance of student volleyball on PB

indicator in group of posttest experiment better than student in group of pretest experiment acceptable. Hence, hypothesis 3 has been tested.

**Hypothesis 4:** Student volleyball smash performance on SA indicators in the posttest experimental group was better than in the pretest experimental group.

From table 11 it can be seen that for SA indicator the significance value is 0,059. Because this hypothesis test is a one-tailed test, then the value must be subdivided 2 ie  $0.059 / 2 = 0.0295$  and the value of this significance is smaller than the significance level of 0.05, then reject  $H_0$  and accept  $H_a$ , which means Student volleyball smash performance on SA indicator in posttest experiment group is better than student in the pretest experiment group is acceptable. Thus hypothesis 4 has been tested for its truth.

## 5 Conclusion

Based on data obtained from expert test result, small group test, field test and product trial, and discussion of research result can be drawn conclusion as follows: 1. Development of learning model of circuit-based volleyball smash has met the operational criteria of a learning model, namely: the syntax contained in it social system, prinsif reaction, support system and accompanist. 2. Results Development of learning model of circuit-based volleyball smash has qualified validity, homogeneity, normality, effectiveness and model of circuit-based development has been able to improve student learning outcomes of regular PJKR Faculty of Sport Sciences Universitas Negeri Medan. 3. From the experiment, the volleyball smash performance was based on the learning factor that the experiment group posttest (new model) and the pretest ekpserimen group (old model) smash volley ball of the experimental posttest group is the lowest score of 12 and the highest 16, whereas in the pretest experimental group, the ability to smash the volleyball earned the lowest score of 10 and the highest score of 15.



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