Learning Model Development in Terms of Kinematic Motion and Role of Media in the Mastery of Volleyball Smash Techniques at Faculty of Sport Science State University of Medan

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Abstract: *The use of education-based technology has resolved and revolutionized the birth of educational innovation to be able to give better education again. Problems that occur in the education world are low level of ability of teachers to deliver an innovation to the implementation of learning, thus requiring the development of technology-based teaching material such as instructional videos. In this study, research and development (R & D) is a strategy or research methods that create learning model in the form of videos that can help teachers and faculty to explain easier about the basic techniques of volleyball smash in terms of kinematic motion and the role of media.*

Keyword: Volley Ball, Kinematic Motion

1. Introduction

The use of strategies in teaching and learning activities are necessary to facilitate the learning process. Without a clear strategy, the learning process will not be directed so the learning objectives that have been set can not take place effectively and efficiently. The learning strategy is not only needed by teachers / lecturers, students may also take advantage of the strategy. For teachers / lecturers, the strategy can be used as guidelines and referencesthat act systematically in implementing the learning. For students as the users of learning strategies, may facilitate the learning process and accelerate the understanding of learning content.

Innovation that produce "e-learning", "virtual learning" is to change the paradigm and process of learning, learning is no longer bound to traditional classes were very limited space and time now. Technology-based education has been above and beyond those boundaries. This revolution has fueled the educational innovation. This means that education and the learning process becomes completely different compared to the past. As revealed in "Zero Project (2010)" from Harvard Graduate Scholl of Education, initiated by Goodman. Some of the programs developed in Zero Project are:

- Catalyst, the development of technology especially computer for education
- Figurative Language: develop student's ability to understand figurative language, especially metaphor and irony
- Arts Project: to understand and improve knowledge of thinking skills, creativity in and through arts, and througharts to understand and learn the science and humanity.

Based on this analogy, the teaching model is kind of a blueprint for teaching, the model that provides structure and guidance for teachers / lecturers. Model and the media is actually a tool to help teachers make their teaching systematically and efficiently, so the learning objectives will be reached in three domains: (1) Cognitive domain, (2) Psychomotor Domain (3) Affective Domain.

2. Literature Review

A. Development Concept
Research and development (R & D) is a strategy or research method that quite powerful. Development research is research used to produce specific products and test the effectiveness of these products. Nusa Putra explained that the research can be divided in several forms: basic research, applied, evaluation, development and urgent. In various studies are based on the function and its application in education and how long results can be used.

B. Developed Models Concept
In terms of the word, media is plural of medium, which means the role or introductory of communication. Then in general according to Sadiman, media is an intermediary or an introductory of message from the sender to the receiver. If observed more closely, at first learning model with media is only believed as a tool to help teachers in teaching (teaching aids). Aiding tools were intended to give a more concrete experiences, motivate and to enhance absorption and memory in learning. Humans basically can learn through six levels (Veron A. Magnesen), namely: (1) 10% of what is READ (2) 20% of what is HEARD (3) 30% of what is VIEWED (3) 50% of what is VIEWED and HEARD (4) 70% of what is SAID (5) 90% of what is SAID and DID.

1) Computer-Based Learning Media
Computer-based learning mediais a learning that use the computer as a tool. Through this learning, teaching materials presented through the medium of the computer so that the teaching and learning process become more interesting and challenging for students. In a computer-based learning is didindividually so that the experience that a student get will be different from what is experienced by other students. (A) Tutorial. (B) Simulation. (C) Demonstration Method.

2) Biomechanics And The Motion Kinematics

Bbiomechanic is the science that applies the law - the laws of mechanics to the structure of life, especially the locomotor system of the body (locomotor, activity that the whole body moves because of its own power and generally helped by gravity). Kinematics is the study of how motion can occur without concerning the cause of the motion.The part of body that we move aredivided into segments. Arm for example, consist of the upper arm (humerus), forearm (radius ulna), and hand (carpal).Those segments are connected together by joints, and each segment has a freedom level of movement in the linear / translational and rotational freedom of movement in the linear / translational and different rotation.

C. Volleyball Game

From many basic techniques that exist in the volleyball game, one of it is a smash technique, smash is a technique is often used to attack and gets a point and victory. Because volleyball game is a fast game, the technique of attack is more dominant than the defensive techniques. Accuracy in anticipation of the arrival of the ball, very influential on stage in the smash, so that all stages in the smash can be done properly. This can only be done by a person who is able to perform the movement of anticipation to the source / object movement, regardless of the source of the motion itself (open movement).

3. Research Methodology

A. Research Purpose

The purpose of this study is to test a model of learning using media in teaching volleyball smash technique in terms of motion kinematics.

B. Approaches and Methods

This study focuses on the development of a learning model, the approach and methods that is used in this study is a research method and development (research and development / R & D), with the design of the chosen development is referred to the development proposed by Borg and Gall (1983).
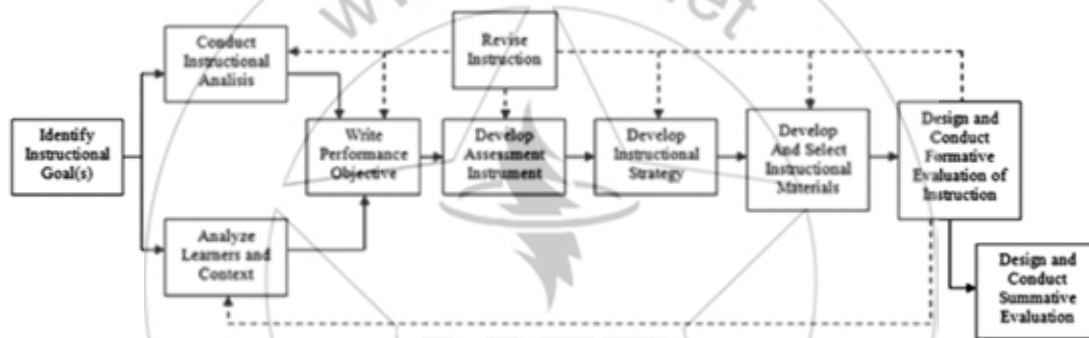
Picture 1: Development Model Phase Borg and Gall

4. Results and Development

A. First Stage Testing Results

The first stageof test istested on 15 students. The test in this stage is divided into two parts. The first part, the students aretested on older learning models (conventional) and the second part, they are tested one the new model.

1. Volleyball Smash Skill Based on Learning Factor

a) The following is description of the data from both of these trials:

Data Description In Experimental and Control Group

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Min	Max
				Lower Bound	Upper Bound		
Model baru	15	18,53	2,800	16,98	20,08	14	23
Model lama	15	14,13	1,995	13,03	15,24	11	19
Total	30	16,33	3,273	15,11	17,56	11	23

Based on the data obtained from the result of volleyball smash skill by learning groups namely experimental group (new model) and control group (older models), is obtained that result of volleyball smash skills in the experimental group 14 is the lowest score and the highest score is 23. While in the control group, the result of the ability spike a volleyball obtained the lowest score is 11 and the highest score is 19. The average score and standard deviation in the experimental group, respectively are 18.53 and 2.8, whereas in the control group are 14.13 and 1.995.

2. The Comparison of Learning Model Effectiveness

Old Learning Model		Assessment Indicator	New Learning Model	
Test Result	% Effectivity		Test Result	% Effectivity
40	66,67%	SIBSS	55	91,67%
41	68,33%	SIKSS	48	80,00%
39	65,00%	AITSM	50	83,33%
36	60,00%	SIBUSS	46	76,67%
28	46,67%	SITSS	43	71,67%
29	48,33%	SIBOSMS	36	60,00%
213	59,17%	Hasil Belajar	278	77,22%

Based on each indicator,theassessment of new learning model is more effective than the old learning model.

B. Second Stage Testing Results

The second stage of test is tested on 56 students. The test in this stage is divided into two parts. The first part, the students aretested on older learning models (conventional) and the second part they are tested one the new model.

1. Volleyball Smash Skill Based on Learning Factors

Data Description In Experimentaland Control Group

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Min	Max
				Lower Bound	Upper Bound		
Model Baru	56	15,38	4,527	14,16	16,59	7	23
Model Lama	56	11,55	3,379	10,65	12,46	6	21
Total	112	13,46	4,415	12,64	14,29	6	23

Based on the data obtained from the volleyball smash skill by learning groups namely experimental group (new model) and control group (older models), is obtained that result of volleyball smash skills in the experimental group 7 is the lowest score and the highest score is 23. While the group control, the result of volleyball smash skill are obtained the lowest score is 6 and the highest score is 21. 6The average score and standard deviation of the experimental group respectively are at 15.38 and 4.527, whereas the control group are 11.55 and 3.379.

2. The Effectiveness of Learning Media Development

The results from the old and new learning models with the learning media development can be seen in the following table :

The Comparison Learning Model Effectiveness

Old Learning Model		Assesment Indicator	New Learning Model	
Test Result	% Effectivity		Test Result	% Effectivity
141	62,95%	SIBSS	170	75,89%
118	52,68%	SIKSS	161	71,88%
93	41,52%	AITSM	131	58,48%
105	46,88%	SIBUSS	143	63,84%
111	49,55%	SITSS	152	67,86%
79	35,27%	SIBOSMS	104	46,43%
647	48,14%	Hasil Belajar	861	64,06%

Based on each indicator,theassessment of learning new model is more effective than the old model of learning.

5. Conclussion

Based on the analysis of data and research findings during learning using learning models development in terms of the motion kinematics and the role of media to mastery of volleyball smash techniques in the field of FIKin Medan state university,the researchers obtainthe follown conclussions :

1) The students' volleyball smash skill at ideal body angle when will smashindicator (SIBSS) in the experimental group is better than the students in the control group.
2) The students' volleyball smash skillatideal angle when starting smash indicator(SIKSS) in the experimental group is better than the students in the control group.
3) The students' volleyball smash skillatideal hand and arm swing when jumping (AITSM) in the experimental group is better than the students in the control group.
4) The students' volleyball smash skillat ideal body angle in the air when smashing indicator (SIBUSS) in the experimental group is better than the students in the control group.

5) The students' volleyball smash skillatideal hand angle when smashing(SITSS) in the experimental group is better than the students in the control group.
6) The students' volleyball smash skillat ideal ball angle when smashing (SIBOSMS) in the experimental group is better than the students in the control group.

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