

TURNITIN_C7. Designing Motor Learning in Physical Education at Schools

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DESIGNING MOTOR LEARNING IN PHYSICAL EDUCATION AT SCHOOLS

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Abstract

Physical Education has a goal to develop the cognitive, affective, psychomotor, and physical domain. Motor learning is an essential part of physical education in schools. Motor learning is defined as an attempt to change the motor behaviour through the conditions and situations that deliberately created to make the process of change to be effective and efficient. Developing motor skills is a part in motor learning. Physical and psychomotor domains have more important role in motor learning. Physical education teachers have a very important role in determining the success of motor learning. Motor learning in physical education at the schools, is influenced by several factors, such as: 1) to understand what should be learned, 2) an opportunity to respond, 3) feedback, and 4) reinforcement. Designing motor learning conducted by physical education teachers, should be based on these principles: build progress (extension), pay attention to the quality of student performance (refinement), and provide opportunities for students to apply the skills affect the motor learning.

Keywords: design, motor learning, physical education

INTRODUCTION

Physical education is a part of the whole educational process. The essential goal of physical education is the same as the purpose of education in general. The purpose of learning is to produce a change in behavior, as well as the purpose of physical education also to cause a change in behavior. The process of learning to move and learning through movement are the characteristic of physical education. In physical education, students will learn and taught through certain movement in order to achieve the learning objectives. In addition, students are also taught to practice the certain movement. In the physical education, students will be engaged in motor learning.

Motor learning is a series of association training or experience that can change the direction of movement to a certain performance skill. Changes in learning motor skills movement is an indication of the learning process performed by a person. Motor learning in physical education basically include cognitive, psychomotor, affective and physical domain. Cognitive domain is used to study the behavior of movement which include mind-body connection. Psychomotor domain includes process of development, stabilization, and a decrease in physical structure and function of neuromuscular. Affective domain deals with emotions and feelings. Physical domain in motor learning can be divided into organic freshness and physical fitness. In the physical education, students will be involved in motor learning. Motor learning has an important role in physical education. Physical education has two important aspects. The first aspect relates to the efforts to improve the physical abilities and the second aspect deals with

the efforts to improve the quality of the motor. Efforts to improve the physical ability can be done by doing physical activity which refers to the principles of physical exercise (physical training). Meanwhile, efforts to improve the motoric quality based on the principles of motor learning.

Motor skills acquired in motor learning, not only influenced by the maturity of motion, but also factor of motor learning process. The role of physical education teachers is crucial to success in motor learning in physical education at school. Additionally, the success of motor learning is also influenced by the environment, the ability of students, and the tools and facilities. Physical education teachers in the motor learning skills should be able to guide and create an atmosphere that is conducive and supportive, so that the motor learning process can run smoothly and successfully. Physical education teachers should be able to design a motor learning in physical education by adjusting learners' ability. The principles in designing learning materials in the motor must be considered by the teacher before delivering the material to the students.

LITERATURE REVIEW

THE NATURE AND THE ROLE OF MOTOR LEARNING IN PHYSICAL EDUCATION

The notion of motor learning can not be separated from the notion of learning in general. Motor learning is a learning process that leads to the dimensions of movement, which is actualized through motor responses which are shown in the movement of the body or specific body parts to improve the quality of movement, (Heri Rahyubi, 2012: 208). According to Sugiyanto (1993: 232) motor learning is a form of learning that emphasizes on something specific, that is for the purpose of improving the quality of body movement. Meanwhile, Schmidt (1991) views motor learning as a set of processes associated with practice or experience leading to a relatively permanent change in a person's ability to show the skilled movements. Someone who does motor learning properly will experience some changes, for example, students who from unskilled become skilled, from unable become able to perform something related to matters of movement and motor. Motor activity here can be in the form of movement in sports, music, art, and other works and professions. From some opinions above, it can be concluded that motor learning is a series of learning process exercises to get change or improve the quality of motion or movement to get more skilled movement

The targetted domains physical education are cognitive, psychomotor, affective, and physical. Motor learning has a very important role in physical education. The role of motor learning in physical education is related to physical and psychomotor domains. According Sugiyanto (1993 : 236), the role of motor learning in physical education in an effort to achieve such goals: 1) to develop motor skills body, 2) to control of movement patterns of sports skills, and 3) to express personal behavior patterns and interpersonal are both in the game and dance. To achieve the goal of improving the quality of a person's motor skills, the undertaken activities should be based on principles of motor learning. Principles to be considered in motor learning include: **The first principle, a learning exercise and experience influence:** The development of capabilities can indeed be developed without training. The abilities can be developed, for example, because of the influence of maturity and growth. This kind of capability changes will increase the skills, although only up to the minimum level. A simple example of this case is the skill to run. Without practicing in the real practice, the ability to run will keep growing due to the influence of maturity. Any normal child will surely

master the skills of running without having the practice. Changes in children's skills because of the maturity of the children certainly can not be said as a result of learning. This is due to the students' change is not a result of the exercise. From the above definition, it can be said that the change must involve the proper training or the provision of a particular experience. **The second principle, learning is not directly observable:** Many changes in the central nervous system, when the exercise takes place. These changes occur because the weaving motion of various abilities and experiences in the memory systems of the brain. This process is usually solidify the changes to be relatively sedentary. This process generally can not be directly observe. What can be done is to look at the changes that occur through the appearance of the movement. Exercise causes the changes of "panel board" in the brain that are associated with the program movement, so the movement is being performed looks better. **The third principle, the changes are relatively settled:** It is important to believe that exercises are the factors that will affect the appearance. The Changes of the skill will characterize the ability of the person and will be useful when it is needed in certain time. The new capabilities that will be brought wherever the person move.

FACTORS AFFECTING THE MOTOR LEARNING

Success in motor learning in physical education at school is influenced by several factors. According to Heri Rahyubi (2012: 358), motor learning is influenced by four factors, such as: to understand what is to be learned; the opportunity to respond, feedback, and reinforcement. **The first factor is "to understand what is to be learned"**. This relates to the clarity of the learning goals, which is the skill that must be mastered, is the circumstances in which it should be known by the learners to help achieving the learning effectiveness. In the learning process, this situation is often referred to as a way to give the stimulus. Stimulus factors have a positive impact on the effectiveness of motor learning, especially in physical education. **The second factor is the "opportunity to respond"**. The opportunity to respond is the dominant factor affecting the control when learning process takes place. This refers to the quality response that must be obtained by learners. Sometimes, students have many opportunities to respond during learning process, but they do not show the quality response. **The third factor is "feedback"**. Feedback determines the success of motor learning, without feedback the motor learning will not be successful. The more fixed information given to students in giving feedback, the sooner the student will master the skills of movement. **The fourth factor is "reinforcement"**. It is a series of steps that follow a behavior that increases the chance that the behavior will be repeated. Reinforcement can be done in variety forms, such as: the words used by the teacher, friends' recognition, winning the game, awards, and so forth. Here is a chart to clarify the factors that affect motor learning in physical education:

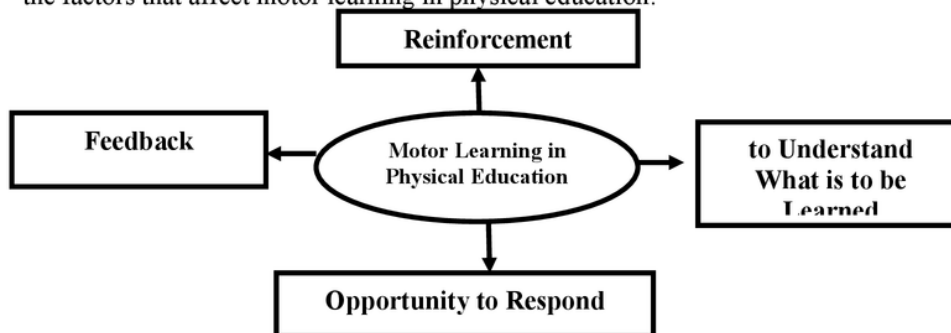


Figure 1. Factors that Affect of Motor Learning in Physical Education.

Meanwhile, according to Heri Rahyubi (2012: 208), motor learning is also influenced by four factors, they are: the individual, the environment, equipment or facilities, and teacher (facilitator). In terms of individual factors relate to the potential, talent, ability, and willingness of the learner. Environmental factors relate to the matter of whether a place used to conduct the learning process is a conducive environment or not. The equipment or facility factor relates to the availability of tools or infrastructure to support the smooth process of motor learning. While the teacher or facilitator factors relates to the extent to which a teacher is able to guide and create an atmosphere so that the motor learning process can run smoothly and successfully.

STAGES OF MOTOR LEARNING

Fitts and Posner cited by Judith E. Rink (2010: 25) the stages of motor learning, such as:

1. **Cognitive stage.**

The learner uses information on how the skill is to be performed to develop an executive/motor plan for a movement skill. Thought processes are heavily involved as the learner consciously attends to requirements of the whole idea of the skill and sequencing the pattern. Student responses are characterized by a high degree of concentration on how to perform the skill. The learner is unable to manage small details of the movement or cope with adapting the movement to environmental changes.

2. **Associative stage.**

The learner can begin to concentrate on the temporal patterning of the skill and the refinement of the mechanics of the skill. For most complex skills learner is in this stage a great deal of time. The learner at this stage can profit from feedback and can begin gradually to cope with external demands of the environment. All the attention of the learner does not have to be on every aspect of the performance.

3. **Automatic stage.**

The goal of motor learning is for the skill to be performed automatically. At this stage the learner does not have to give cognitive attention on the movement itself. Performance is consistent and can be adapted to the requirement of the environment, such as where to place the ball and defensive players in open skills.

DESIGNING AND DEVELOPING MATERIALS MOTOR LEARNING IN PHYSICAL EDUCATION

Development in motor learning materials should consider several principles. According to Judith E. Rink (2010: 83-85) that the development of good material has the following characteristics:

1. **Developing Progress (extension).**

Building progress is an attempt to sort the material from the easier one to more difficult or from simple to complex. Teachers can do this by creating a series of task enrichment. Teacher starts the lesson with the easiest exercises and gradually increase the difficulty level of the exercise. Sometimes, teachers do not increase the level of difficulty of an exercise but find other ways to practice exercise in a different way.

2. **Attention to the quality of student performance (refinement).**

The teacher's caring on the quality of student performance can be shown by giving good feedback on the overall performance of students in a class or individually.

3. Provide opportunities for students to apply skills (application)
Teachers should provide opportunities for students to apply what they have learned so that both teachers and students can determine the level of students' understanding of the material. Exercises that give students the opportunity to practice often referred to as an applied practice. Teachers usually start learning by providing informing task. From this informing task, teachers develop materials by integrating three other materials development principles: 1) extension: the arrangement of the material from the easier to more difficult, 2) refinement: focusing on the quality of students' performance, and 3) application: the application of skills learned

Analysis of material development helps teachers to provide appropriate training and sequentially material. This analysis helps teachers to identify the characteristics of a good performance and to integrate applied practice. The analysis begins by identifying the aspects of development progress (extension) of a skills development. In developing learning materials, physical education teachers should be able to show the existence of improvement and progress. At this stage, teachers formulate how to reduce the level of difficulty and complexity of the materials to the students and to develop the parts that would be the sequence of a practice. Here are the factors to be considered in analyzing the development of learning material in physical education:

1. Exercise from each section: the teacher can reduce the level of difficulty of the exercise by dividing the exercises into several parts and having students practice these parts before finally practicing the exercise as a whole.
2. Modification of equipment: the teacher can modify the exercise equipment to facilitate the students do the exercises. Modification of sports equipment is highly recommended when teachers teach small children where the size of the equipment is not proportional to their body or when teachers teach beginner students, at any age, who have not had a good ability to use equipment with actual size.
3. Structuring space for practice: the teacher must adjust the space with the material that will be learned.
4. Focus on the purpose of the performance: the orientation of the goal of an exercise can have a strong influence on how students performed a skill.
5. Performance characteristics: a requirement of a performance that can increase or decrease the level of difficulty of the material is specific materials. In some circumstances it can be manipulated, the following requirements may be modified to increase or decrease the level of difficulty
6. Changing the rules: the level of difficulty of a practice can be increased or decreased by manipulating the rules of sport activities. The rules are requirements that limit the performance/movement of a game. Game rules can be modified if such regulations interfere with the game naturally.
7. The number of combined skills: the teacher must consider how a skill is used and prepare students for a variety of ways in which these skills are used with other skills.
8. Development of the number of different responses: in the development of the concept of learning, the ultimate goal of teaching is to make students able to apply the concepts they have learned into practice activities. The development of practical skills will develop a practice that help students to understand a concept and expand

the number of appropriate responses and asks the students to practice what they have learned.

9. Improving quality improvement: this aspect answers the question "how to practice well?" Here is a quality improvement process stage: identifying the instructions that can be used by teachers during the presentation, things to consider when observing the practice of student teachers, and provide information that will be used when giving feedback to students. In the actual learning process, when the students' practices do not meet the criteria, the teacher has several options: fix the practice of any individual if possible, make the task easier, and stop the class and focusing on the instructions for all students to improve their performance.
10. Designing assessment practice: at this stage, teachers prepare analysis columns of practices assessment that describe the development of performance activities. It can help students to apply their improved skills to the changed situation by shifting the focus from how to use these skills or assess these skills. Here is an example of the application of applied exercise: self-assessment (individual/pair), self-assessment (group), competition, judging performance using the criteria.

APPLICATION OF MODIFIED IN MOTOR LEARNING

Motor learning should reflect the principles of Developmentally Appropriate Practice (DAP). DAP principles emphasize that the given task should pay attention to changes in the ability of children and can help develop these changes. Thus, the teaching assignment must correspond with the level of development of students who are learning. According to Yoyo Bahagia and Adang Suherman (2000: 1), the essence of the modification is to analyze and develop the learning materials in a sequence way in learning activities that can potentially facilitate students in learning. It is intended to guide, direct, and teach students who are unable to do to be able to do, from being in lower level to be in a higher level.

Physical education teachers must have knowledge of the analysis of modifications in motor learning. According to Yoyo Bahagia and Adang Suherman, (2000: 2) some aspects that can be analyzed in modifications include:

1. Modification of the learning goals.
Modification of the learning objectives relates to the goal of learning from the lowest highest goal. The modification of material goals is done by: **expansion goals**: learning objectives that emphasize on the acquisition of knowledge and the ability to perform the skills regardless the essence and effectiveness aspects. **Smoothing goals**: learning objectives that emphasize on the acquisition of knowledge and ability to perform efficient movement of the learned skills. **Application goals**: the purpose of learning that emphasizes the acquisition of knowledge and ability to perform the effective movement or learned skills.
2. Learning materials modification
Modification of learning materials relates to learned skills, which includes: **Skill Component**: modifying the skills can be done by adding/reducing the level of complexity and difficulty. Example: analyzing and dividing the overall skill into some parts, then train it each part before doing the whole exercise. **Materials classification**: modifying skill by increasing/decreasing the level of complexity and difficulty based on the skill classification. **Appearance condition**: modifying the conditions of student performance by reducing or adding levels of complexity and difficulty. Example; increasing/decreasing the level of speed, doing in a place or

moving forward or in any direction. **Total skill:** decreasing or increasing the level of complexity and difficulty by combining movement or skill. Example: running while dribbling a basketball, shooting while jumping. **Expanding the number of different responses:** adding the level of complexity and difficulty can be done by increasing the number of different responses to the same concept. Example: the concept of prefix length and strength.

3. Modification of the learning environment.

Modifications can be attributed to the learning environment of learning, which includes: equipment, space arrangement in practice, and the number of students involved.

4. Modification of learning evaluation.

Modification of learning evaluation activities includes the preparation of the study focused on the evaluation of student skills already learned in a variety of situations. Evaluation activities may change the focus of students' attention on how the skills should be done into how those skills are used or what the purpose of that skill is. Some modification forms of evaluation include: self-testing (individual or pairs), self-testing (group / group), and the match

GIVING TASK PRACTICE TO STUDENTS

Giving practical work to students should use the proper way to give students a complete overview of the skills that will be studied, including the provision of a description of how the skill performed. According to Agus Mahendra (2007: 6) some things that need to be considered in giving practical work for students, such as, regarding to how to give instruction and modeling/demonstration:

1. Giving instruction.

Giving instructions is a common thing in almost every teaching. Instruction is usually spoken (although it can also be written, and provides information about the most important aspects of a skill. Too much information will soon be forgotten, and also note that the information in verbal form was sometimes limited by the accuracy and truth. Therefore, the instructions given should be short and to the point, emphasizing only one or two general concepts. Furthermore, according to Judith E. Rink (2010: 72), a good command has some characteristics, such as: accurate, it is important to the task practice being described, brief, and appropriate with the age and ability level of students. Singer (1980) cited by Agus Mahendra (2007: 7) notes that giving these instructions must include the following four things: constantly giving instruction and direction, only used as a technique of pre-exercise value transfer (pre-training), encouraging students to respond to the particular sign at the time of certain time, and offer corrective advice on appearance is concerned.

2. Modelling and demonstration.

The best media in delivering instruction before students perform a movement task are visual aids, such as a true picture of a technique or skill, movie clips, video, or demonstration by peers or by teachers themselves (modeling). Information about skills in this way is not limited by the use of words, but strengthened with a vivid description of the movement to be studied. According to Judith E. Rink (2010: 72), in providing a task demonstration to the students, teachers should consider several principles: demonstration should be accurate, demonstration should be done by students, demonstration should be in the correct movements, emphasizing the

important information of an exercise, explain why the exercise is done, check the students' understanding after the demonstration, and demonstration should be performed more than once. Agus Mahendra (2007: 9), explains that in order to optimize the demonstration, the teacher should be guided by four things: the students should be made aware to observe the examples given with full attention, the teacher must deliver optimal information that can be processed by the ability of students, the demonstration will give a better effect if repeated more than once, and it is helpful to be able to show a demonstration in the form of films.

CONCLUSION AND SUGGESTION

The learning of school physical education is related to motor learning. Motor learning in physical education at schools provides the opportunity for students to get relatively permanent change in a person's ability to show the skilled movements. Material or movement in the motor learning task given by the teacher must be designed appropriately and correctly so that the learning goals can be achieved successfully.

Designing motor learning in schools which conducted by teachers, should pay attention to these several things: the factors that affect motor learning, motor learning principles, stages of motor learning, considerations in developing materials or motion tasks to students, giving the task to the student movement and the application of the modification in motor learning.

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