

Development of Teaching Materials of Weight Training Courses to Improve the Quality of Learning Students Department of Sports Science

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Abstract. Teaching materials are the materials that will be given to students, they are an important part of the learning process. Good teaching materials must be tailored to students' expected goals and skills. The goal of this study is to create textbooks with teaching materials for weight training classes for Sport Science students. The development research method was used in this study. The State University of Medan's Faculty of Sports Science was the location of this study, involving 30 students as samples and 3 experts in the field of sports coaching and 2 exercise physiologists. This research has produced a textbook with the following framework: Management of weight training, How to determine the initial weight of exercise, create an internal and external weight training program, introduction to weight training procedures, variations in weight training for the chest, variations in weight training for the back, variations in weight training for the shoulders, variations in weight training for the front arms, variations weight training for the back arms, variations in weight training for the legs, and variations in weight training for the abdominals, as well as how to select and organize exercises, manipulate training loads, repetition of exercise movements, sets, and rest periods.

Keywords: Development, Material, Teach, Training, Weight.

1 Introduction

Numerous facets of life have undergone significant shifts as a result of the rapid advancement of science and technology today. The way we work and the jobs we have are changing, and many jobs are going away while new kinds of jobs are being created. Cultural, social, and economic shifts also occur frequently. Universities must respond quickly and appropriately in this extremely dynamic time. In order to equip and prepare college graduates to become a superior generation, learning transformation is required. A generation that is adaptable and prepared to face the challenges of its time without being cut off from the cultural heritage of its nation.

A variety of activities for learning outside of tertiary institutions, such as internships and other work experiences in industry or other workplaces, community service projects in villages, teaching in educational units, student exchanges, research, entrepreneurial endeavors, independent study, and humanitarian programs. The lecturer's supervision is required for each of these tasks. It is expected of independent campuses to provide field-based, contextual experiences that will prepare students for the workforce or create new jobs, as well as enhance overall student competencies. One of the most important manifestations of student-centered learning in the *Kampus Merdeka* is the learning process. Learning in the *Kampus Merdeka* presents challenges and opportunities for the growth of innovation, creativity, capacity, personality, and student needs. It also fosters the development of independence in the pursuit of knowledge through realities and field dynamics, such as ability requirements, real problems, social interaction, collaboration, self-management, performance requirements, goals, and accomplishments. Students' hard and soft skills will develop strongly through an effective independent learning program that is designed and implemented well. It is anticipated that the Independent Learning Program – *Kampus Merdeka* will be able to meet the challenges of higher education and produce graduates who are in tune with the times, technological advancements, business and industrial demands, and social dynamics.

Competence in developing teaching materials needs to be possessed by a lecturer, because teaching materials will make the learning process more effective and efficient. Teaching materials have an important role for lecturers and students, in learning that is carried out individually, in groups and classically. On campus, lecturers are at the forefront of education, which is one important tool for developing students' competence. Students' learning activities are managed by lecturers. The lecturer assumes authority and responsibility for all classroom activities related to learning. Lecturers, who serve as facilitators for students, are in charge of all learning resources, methods, and instructional materials. Each study program at Medan State University has undergone numerous curriculum revisions as a result of the implementation of the Independent Learning curriculum. The Sports Science program at Medan State University also underwent this revision to the curriculum. This modification to the curriculum is a way to adapt to changes in the competencies that graduates of the Sports Science program need to have in order to meet the needs of stakeholders. Existing courses undergo modifications, resulting in courses that are no longer required for the current period and others that are added out of necessity.

The weight training course is a physical fitness concentration course that will be undertaken by students in semester VI. In general, this course aims to provide knowledge and understanding of weight training methods, weight training procedures and weight training programs. Because students will learn how to strengthen body muscles through internal and external weight training exercises in order to form a more proportionate body, this course is very important for students to know and comprehend.

This research aims to create teaching materials in the form of textbooks for weight training courses that students can use to make it easier for them to attend lectures and complete lecture assignments.

2. Literature Review

In the form of learning materials that are packaged as materials to be presented during the learning process, teaching materials are one component of several learning resources. Learning resources or physical vehicles containing instructional materials that can motivate students to learn are known as teaching materials. Due to the fact that teaching materials are things that need to be given out, they play a crucial role in the learning process. Good teaching resources need to be tailored to the objectives and skills that students are expected to possess. The teaching materials used will play a role in determining whether or not the expected learning competency goals are met. As a result, instructional materials are the foundation of the curriculum and a means of achieving learning objectives.

The presentation's teaching materials include descriptions of facts and principles, norms related to rules, values, and attitudes, and a set of actions and motor skills. As a result, the fundamental components of learning materials are knowledge, values, attitudes, behaviors, and skills. They also contain messages, information, and illustrations in the form of facts, concepts, principles, and procedures related to particular subjects that are intended to help students accomplish learning objectives.

The term "teaching materials" refers to basically any and all items (texts, tools, and information) that have been arranged in a systematic way. This gives a complete picture of the skills that students will be able to master and is used in the learning process to plan and study how learning is put into practice.

Weight training consists of two words, namely, exercise and load which according to Harsono [5]"Training is an activity that takes place continuously, which is carried out systematically and repeatedly and the load is increasing day by day" in this case training is more of an exercise in activities. sport. According to Nossek [7] (1982:3) training is a process for developing complex sports performances by using training content, training methods, organizational actions that are in accordance with goals. According to Bompa [4] (1994:4), exercise is a systematic sporting activity over a long period of time, progressively and individually enhanced which leads to the characteristics of human psychological and physiological functions to achieve the specified goals.

Weight training is done regularly and accompanied by good eating habits, various body systems will change positively. Muscles will become strong, can carry a greater workload, reduce fatigue as a result of regular and continuous exercise. The neuromuscular system will function in harmony, because the brain learns to select muscle fibers that have special characteristics to increase the resistance of various loads, speed of movement, and movement patterns required in various variations of exercise. Weight training also causes changes in the cardiovascular system, although the changes are small. The adaptive response to exercise will increase the ability of muscles and nerves to increase the speed of movement. The factors that influence the addition of muscle strength are influenced by changes in nerve changes during exercise, where the density that occurs and the composition of the type of muscle fiber changes due to the response of weight training. Muscle hypertrophy is caused by an increase in existing muscle fibers, muscle fibers that have been present since birth, very fine protein myofibrils (actin and myosin) in the fiber increase in size, this is what causes visible changes in muscle size.

Muscular endurance is the ability to carry out repeated muscle contractions over a period of time, or the ability to extend the training time before the onset of muscle fatigue. This is different from strength, the size of an all-out effort. Overtraining is a condition where there is a plateau or decline in performance for a certain period of time. This happens when the body does not have enough time to repair itself from the previous exercise. Often this state of overtraining is the result of ignoring the need to train too hard. Signs of physical fatigue due to excessive exercise are: Severe pain and stiffness on the day after exercise, muscle pain that increases slowly from one training period to another, weight loss, inability to complete a period of exercise, based on current physical condition, loss of appetite.

When we engage in regular sports or physical activity, our bodies can undergo significant physiological changes. As a result, the body's response to exercise resembles the body's response to stress in two ways. One of them is a short-term response, also known as acute exercise or a single attack following occasional exercise. The second aspect is the long-term response that comes from regular exercise. This response makes it easier to train again and makes performance better. "Training" refers to this adaptation to prolonged physical activity. A response to exercise that has an effect on training is adaptation to acute exercise.

Energy requirements are met by this short-term and long-term response. In order to meet the increased demand for oxygen, nutrients, the elimination of metabolic end products like carbon dioxide and lactic acid, as well as the release of excess heat, as well as the rapid increase in energy requirements that occur during exercise, a balanced adjustment of the blood circulation is required. All of the body's systems—neuromuscular, respiratory, cardiovascular, metabolic, and hormonal—act in concert to cause changes in metabolism.

3 Method

The Research and Development method is utilized in this study. As a basis for redesigning the curriculum, the needs of the user are examined at the outset of this study. After that, materials for making teaching materials were gathered. The goal of this study was to create teaching resources in the form of printed weight training books. Redesigning the curriculum through a needs analysis involves gathering information from stakeholders, personal trainers, sports coaching science professors, and sports physiology professors about the curriculum (silabus and SAP) that has been used up to this point. Stakeholders, personal trainers, coaching science lecturers, and exercise physiology caregivers also provided data. Still, the order and depth of the material covered are taken into consideration when making teaching materials. Following the preparation of the teaching materials, seminars are held to produce teaching materials in the form of printouts of good weight training books that meet competence requirements.

4 Results and Discussion

In order to meet the requirements of development research, this study produced a weight training book framework that has been subjected to multiple expert validation processes. The framework of the contents of the book are: weight training management, how to determine the initial load

at the beginning of the exercise, making internal and external weight training programs, introduction to weight training procedures, variations in weight training for the chest, variations in weight training for the back, variations in weight training for the shoulders, variations weight training for the front arms, variations in weight training for the back arms, variations in weight training for the legs, and variations in weight training for the abdominals, as well as how to choose and organize exercises, manipulate training loads, repetition of exercise movements, sets, and rest periods . One focus group discussion (FGD) and two expert validations led to these findings. Researchers have identified many teaching materials that students must master in order to comprehend the content of weight training courses with the current MBKM curriculum in the first stage of drafting. These materials include routine assignments, book reviews, journal reviews, project reviews, and mini research.

In order to meet the requirements of development research, this study produced a framework for a weight training book that has been subjected to multiple expert validation processes. The book's content is organized as follows: weight training management, how to determine the initial load at the beginning of the exercise, create an internal and external weight training program, introduction to weight training procedures, variations in weight training for the chest, variations in weight training for the back, variations in weight training for the shoulders, variations Weight training for Broadly speaking, the purpose of this course is that students are able to master and understand the management of weight training, both in preparing internal and external weight training programs and in implementing programs in the field. This course takes place in theory and in direct practice in the physical laboratory of the Faculty of Sports Science, practical activities in the form of preparation of weight training programs, measurement of initial training loads, weight training management, how to determine the initial load at the beginning of exercise, making internal and external weight training programs, introduction to procedures weight training procedures, variations of weight training for the chest, variations of weight training for the back, variations of weight training for the shoulders, variations of weight training for the front arms, variations of weight training for the back arms, variations of weight training for the legs, and variations of weight training for the abdominals, as well as how to select and organize exercises, manipulate training loads, repetition of exercise movements, sets, and rest periods.

In order to get feedback on the draft of teaching materials that will be developed for the preparation of weight training course textbooks, focus groups were held with experts, particularly strength conditioning training specialists, and exercise physiologists. The FGD's development of teaching materials for this weight training course involved five experts. Two exercise physiologists and three specialists in physical conditioning. Several inputs were included in the FGD's outcomes to further refine the teaching materials' draft.

An expert validation test was carried out following the FGD to ascertain whether the draft of the material for the weight training course could be used as teaching material in accordance with the MBKM curriculum. One exercise physiologist and one expert in sports coaching participated in this validation test. Specifically, agree on the draft teaching materials for weight training courses using a book framework. management of weight training, how to determine the initial load at the beginning of the exercise, create an internal and external weight training program, introduction to weight training procedures, variations in weight training for the chest, variations in weight training for the back, variations in weight training for the shoulders, variations in weight training for the front arms, variations of weight training for the back arms,

variations of weight training for the legs, and variations of weight training for the abdomen, as well as how to choose and organize exercises, manipulate training loads, repetition of exercise movements, sets, and rest periods.

5 Conclusion

The research's conclusion is the creation of a framework for a weight training book that has been subjected to a number of expert validation processes in order to meet the requirements of development research, as discussed in the preceding chapter. The structure of the book's content, namely. management of weight training, how to determine the initial load at the beginning of the exercise, create an internal and external weight training program, introduction to weight training procedures, variations in weight training for the chest, variations in weight training for the back, variations in weight training for the shoulders, variations in weight training for the front arms, variations of weight training for the back arms, variations of weight training for the legs, and variations of weight training for the abdomen, as well as how to choose and organize exercises, manipulate training loads, repetition of exercise movements, sets, and rest periods.

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