

Analysis of the Teaching Difficulties of Exercise Physiology in the Context of Teacher Training Professional Certification

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Abstract: Exercise physiology is a core course for physical education majors and a basic theoretical subject for physical education and health in elementary and middle school physical education textbooks, but it is one of the more difficult courses to understand for students in physical education majors. In the recent years, the certification of teacher education programs has raised higher requirements for students in physical education majors as well as greater challenges for the teaching of exercise physiology. This article summarizes several teaching difficulties of exercise physiology in the context of teacher certification, with a view to providing reference for the majority of frontline teachers to explore solutions.

Introduction

Physical Education is one of the early majors in physical education institutions, and its goal is to train complex talents who can engage in physical education teaching, after-school sports training and competition, as well as in school sports research and school sports management. Exercise physiology focuses on the functional changes of human cells, organs and systems during exercise and their ability and mechanism of working together; it also observes the adaptive changes in the morphology and functions of the human body produced by exercise [1]. Exercise physiology is a core professional course for physical education majors, a required subject for teacher qualification examinations, and the core theoretical basis for the primary and secondary school physical education textbook Physical Education and Health, which has an irreplaceable role in the process of training physical education students. Exercise physiology is an applied basic theory subject, so the current textbook arrangement is mainly divided into the basic theory part and the application part. The basic part contains the functions of major systems, measurement methods and the interaction with exercise, which is the basis of the applied part and also the difficult part of teaching. The applied part contains the formation of motor skills, evaluation of motor functions, special environments and populations, which is the extension of the basic part and also the focus of teaching. In the past, the teaching usually proceeded in order of chapters, but because of the poor cultural foundation of physical education students, they would spend too much time on the basic part, which made the application part unable to be taught in depth. In addition, the content of the application part can involve various aspects of school sports, competitive sports and community sports, among which school sports and competitive sports (after-school sports training and competition) are within the training objectives of physical education majors, resulting in the lack of direction when teachers explain.

The basic concept of "student-centered, output-oriented and continuous improvement" is clearly put forward in the accreditation of teacher training programs in general higher education institutions, which advocates that the teaching process should be centered on students' learning; the teaching results should take into account social needs and focus on students' "what they have learned". "What students have learned and what they can do. Through this accreditation standard, the current exercise physiology teaching should be the following 3 points of reflection: 1. The goal of "learning" knowledge should be upgraded to "teaching" knowledge. 2. The teaching method

should be changed. The teaching mode centered on "teacher teaching" should be changed to one centered on "student inquiry learning". 3. The allocation of class time should be changed. Shorten the teaching time of the basic part of the textbook and increase the teaching time of the application part. In this context, this paper, combined with the actual teaching, has sorted out several difficult problems encountered in the teaching process of exercise physiology and strategies to cope with them, in order to provide reference for the teachers.

1. The Contradiction between Increasing Difficulty of Teaching Objectives and Decreasing Class Time

Before the implementation of teacher training professional certification, the teaching objectives of exercise physiology were divided into 2 levels: 1) all students needed to master the knowledge points in the textbook; 2) students who had the ability to learn learned to apply the knowledge of exercise physiology to solve the practical problems in teaching and training. Even with this goal system, only a few students were able to reach level 2, and even some individual students needed to take a make-up exam to pass the exam. After the implementation of the teacher education certification, students are required to learn to speak on the basis of "learning", which adds a new level of difficulty to the teaching objectives. In the past, students were required to learn teaching concepts and skills in courses such as education and psychology, and the separation of professional knowledge and teaching skills resulted in students not being able to speak even if they had knowledge of exercise physiology. To make matters worse, exercise physiology class hours have been decreasing in recent years [2-4], which has increased new difficulties in reaching the goals of teacher education majors after accreditation.

2. Contradictions between Accreditation Standards and Delivery Methods

Teacher education accreditation standards advocate "student-centeredness"[5-7], so flipped classrooms [8-10], small group instruction [11, 12], and other delivery methods are more appropriate for teaching in the current format. However, some schools teach exercise physiology in large classes, which can easily have 80-100 students, bringing great challenges to the student-centered teaching model. We found through practice that flipping the classroom under large class teaching can improve the learning effect of a few good students, but it provides the opportunity for most students to avoid learning, which leads to the phenomenon that the good students are better and the students to be improved are declining in performance.

3. The Contradiction between Subject Characteristics and Students' Learning Background

This contradiction contains 2 aspects: 1. Exercise physiology is a science-based subject, so students who have studied biology in high school will be more receptive. However, most physical education majors in Jilin Province have a liberal arts background, so it is difficult for them to learn the subject from scratch, and many of them cannot even understand what muscle fibers are. 2. There are many terms in exercise physiology that need to be understood by students, and they need to further smooth out the relationship between the terms. However, physical education students have poor learning foundation, and we found that individual students can't even break sentences when reciting, so it is very difficult for them to "speak".

4. The Contradiction between the Characteristics of the Subject and the Inertia of Students' Learning Minds

Exercise physiology is a manual of the human body, a movement event requires the cooperation of multiple systems to achieve, for example, aerobic exercise involves cardiorespiratory function, blood, skeletal muscle, energy metabolism, etc. Therefore, if you want to learn this subject well, you must have a holistic concept, that is, the human body as a whole, rather than relying on a

certain organ to evaluate a certain movement. However, because the learning process of students has always started from the knowledge points, resulting in a lack of generalization of the connection between the knowledge points, even if the teacher intentionally guides in the classroom to summarize the relationship between the knowledge points, the students' mastery is still very unsatisfactory. After graduation, most of the students consider the problems only limited to skeletal muscles, and their understanding of other organs is very weak. In this case, students who go to the workplace to explain the "Physical Education and Health" course will have the problem of inappropriate and inaccurate explanation due to their own incomplete understanding. In the context of teacher training professional certification, this contradiction is especially prominent.

In conclusion, after the implementation of teacher education professional accreditation, it provides a clear teaching direction for exercise physiology, but also brings new challenges, and only by solving the current problems well can we train better teachers.

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