

The Physical Culture Infiltration in College Physics Teaching of Electromagnetism

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Abstract: The goal of physical culture infiltration in the electromagnetism teaching is consistent of the quality education, this article analyzed the physical culture in electromagnetism, emphasized the importance of physical culture infiltration in the electromagnetism teaching.

1. Introduction

Electromagnetism not only has almost perfect theory, the application of a wide range of basic knowledge, but also a very rich physical and cultural connotation, fully and comprehensively reflects the famous American physicist, educator Feynman proposed the value of physics [1-4]. However, the traditional teaching generally emphasized that the electromagnetic system as a mature theory of rigorous system and knowledge structure, too much emphasis on step by step, logical reasoning, formed a strict and rigid teaching framework, the formation of a cheerful teaching methods and exercises But also the great loss of the value of electromagnetic education is not conducive to cultivating creative talents. It is not only difficult to achieve the teaching effect, but also the great loss of the value of electromagnetism education, which is not conducive to cultivating creative talents. Based on the important value of electromagnetism in scientific quality education and the deficiency of traditional electromagnetism teaching, we will further explore the teaching idea of university physics electromagnetism under the view of physical culture[5-6].

2. The Physical Culture in Electromagnetism

The physical culture is mainly composed of four basic elements: material equipment, conceptual form, language symbol and knowledge system[7]. It has the cultural attributes of human creativity, historical achievement and sociality. In physics, the physical culture of electromagnetism embodies particularly full, comprehensive, prominent and exciting, specifically in the following aspects:

2.1. Deeply Theoretical and Ideological Property.

Electromagnetism theory is the most perfect theory in physics, and the great achievements of the landmark in the history of physics, at the same time it provides a glorious example to understand what it is a physical theory and how to build physical theory[8]. Electromagnetic theory is one of the basic theories of natural science, while it is also an important source of modern physical thought such as relativity, quantum mechanics, symmetry and so on.

2.2. Classic scientific thinking and methodology.

From the discovery of electrical and magnetic phenomena, the observation of the phenomenon, the measurement, analysis, analogy, conjecture, and even the hypothesis, the design of key experiments, and finally determine the basic law of electromagnetic phenomena, the main theory of electromagnetism are derived from scientific experiments and scientific hypothesis[9-10]. Such as Franklin's Kite Experiment, Coulomb's Button Experiment, Oster Experiment, Faraday Electromagnetic Induction Experiment, Hertz's Electromagnetic Wave Experiment, Faraday Field

and Field Line Hypothesis, Maxwell "Displacement Current", "Induction Electric Field" Hypothesis and so on, both are the models of epistemology and methodology in the natural science research, shining with the light of creation, imagination and wisdom.

2.3. Rich philosophical thinking.

Electromagnetic field as a new material form, enriched our material view. The law of electromagnetic motion and the relative performance of electricity and magnetism give us a deeper understanding of the theory of relativistic space and time. The discovery and development of electromagnetism itself fully embodies the philosophical thinking of universal connection, dialectical development, harmony and unity.

2.4. Typical scientific beauty.

Electromagnetism presents a subtle delicate symmetry and rational beauty, such as the symmetry of Coulomb's law and gravitation, the symmetry of electric and magnetic laws, the Maxwell's equations and so on.

2.5. Scientific spirit and scientific attitude.

In the history of electromagnetism, a series of great physicists have shown a noble scientific spirit and scientific attitude, such as Franklin, Oster, Ampere, Faraday, Maxwell and so on.

2.6. Abundant electromagnetic material achievements.

In real life, electromagnetic products based on electromagnetic principle are everywhere, such as generators, motors, computers, mobile phones, TV, fluorescent lamp, microwave oven, photocopiers, radar, laser, magnetic levitation and so on.

3. The Consistency of the Objective of Infiltrating Physical Culture and Quality Education in the Teaching of Electromagnetism

From the concrete manifestation of the quality education in college physics electromagnetism teaching, the knowledge structure, the world view philosophy of science, the scientific spirit, the scientific attitude, the scientific thought, the scientific method and the physical aesthetics thought belonged to the category of physical culture. The goal of the physical culture infiltration in electromagnetism teaching and science quality education are both to break through the traditional teaching of the single knowledge education to the combination of inside and outside the comprehensive, harmonious, multi-dimensional, synthetically quality cultivation. The electromagnetism teaching under the physical culture can fully achieve the function of electromagnetism course education and education value.

4. Infiltrate the Physical Culture in College Physics Electromagnetism Teaching

Infiltrating the physical culture in college physics electromagnetism teaching, it is necessary to fully excavate the cultural connotation of electromagnetism, highlight the cultural taste of electromagnetism, and use electromagnetism as a holistic culture to teach in the background of history and reality. Cultivating students' solid foundation of knowledge and comprehensive analysis, induction, deduction of logical thinking ability through the perfect and rigorous theoretical system of the electromagnetic system itself, and emphasizing students' creative thinking and scientific literacy cultivation by using the development process of electromagnetic theory and practice, emphasizing the full understanding of physical thought, physical methods and thinking, scientific spirit, scientific morality, values and other physical culture, it is the intrinsic value of electromagnetism.

Infiltrating the physical culture in college physics electromagnetism teaching, on the one hand is conducive to cultivating students' scientific literacy and innovative spirit, on the other hand is conducive to ease the students on the electromagnetic fear and exclusion of psychological, the latter is more important and fundamental. The teaching in the view of physical culture, in the aspects of

knowledge, cultivation, classroom teaching arts and technology, also makes higher demands on teachers.

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