

Research on the Ideological and Political Education of College Physics under the Background of “Emerging Engineering Education”

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Abstract: Under the background of “Emerging engineering Education”, college physics, as a basic course of science and engineering, has a wide range of courses and a large number of students. Therefore, the content of ideological and political education in college physics teaching has a wide audience, and the material of physics development history is very rich. This paper expounds the infiltration of ideological and political education in College Physics teaching from three aspects: The history of scientific development, philosophy of science and sociology of science. Realize the whole process and all-round education during college physics teaching. In the process of imparting knowledge, we should emphasize the education of the mainstream value, scientific literacy, ideals and beliefs, and conduct virtue education.

Keywords: Emerging Engineering Education; College Physics; Ideological and Political Education

The connotation of Emerging engineering Education is to cultivate future diversified and innovative outstanding engineering talents. It should take moral education as the guide, take coping with changes and shaping the future as the construction concept, and take inheritance and innovation, intersection and integration, coordination and sharing as the main ways. The Emerging engineering Education has the characteristics of strategic, innovative, systematic and open. As a basic subject of science and engineering, college physics is more important under the background of Emerging engineering Education. Ideological and political education is the primary content of China’s spiritual civilization construction, and also one of the main ways to solve social contradictions and problems. Ideological and political education is very important and difficult to do. The general office of the CPC Central Committee and the general office of the State Council required to deeply tap the ideological and political education resources contained in all courses in colleges and universities, and solve the problem of coordination between various courses and ideological and political courses. We should give full play to the educational function of all courses, build a curriculum system with comprehensive coverage, rich types, progressive levels and mutual support, so that all kinds of courses and ideological and political courses can go in the same direction and form a synergistic effect. It is an important direction for ideological and political education to carry out the whole process of education and teaching, and to realize the whole process of education and all-round education. This paper mainly discusses how to infiltrate ideological and political education in college physics teaching.

1. Concept change and ability improvement

University physics is a natural subject course. Teachers and students generally believe that ideological and political education is a special course, which belongs to liberal arts. On the surface, it doesn’t matter with the college physics. Therefore, teachers often pay more attention to the cultivation of students’ professional basic theoretical knowledge and practical skills, but ignore the integration of them with ideological and political education. It is the responsibility of the teachers of professional courses in colleges and universities to take “educating people” as their basic mission. During teaching of professional courses, we should guide the

undergraduates in value and deliver the correct guidance, let the socialist core values into the classroom and students' minds, and build a "Three Aspects of Education" pattern of "all staff, all process and all-round". Therefore, the first is the change of teachers' concept and let them realize the purpose and function of ideological and political education. Educating people is the most important part of education, not just the purpose of ideological and political education. Professional course teachers should integrate ideological and political education into professional course teaching, moisten things silently and get twice the result with half the effort. To realize the importance of ideological and political education in the teaching of professional courses and complete the transformation of their own ideas, the next step is to cultivate and improve teachers' teaching ability of ideological and political. There are many materials in physics, but how to strengthen the cultivation of students' ideological and political literacy in the process of teaching professional knowledge is a test of teachers' ideological and political ability. Find the right way to integrate in naturally and smoothly, so that students are willing to accept and benefit from it. Ideological and political education should be integrated into all aspects of the course teaching, so as to realize the teaching knowledge to students, the cultivation of value and ability.

2. Ways of integration

Every subject has its history of scientific development, philosophy of science and sociology of science. We actively cultivate and improve students' scientific literacy from the history of science, philosophy of science and sociology of science. Teachers should cultivate students' dialectical materialist world outlook, patriotism and national pride, and establish correct values and social responsibility. Take college physics course as an example, we analyze the integration of ideological and political education course in professional course teaching from the above three aspects.

2.1 History of scientific development

The development history of a discipline is actually the hard struggle history of scientists of all ages. A big step for everyone is a small step for the development of the discipline. When talking about the history of scientific development, we can infiltrate the ideological and political content through the anecdotes of scientists. Such as patriotism and national pride education; Scientific spirit and social responsibility. After hearing the news of the founding of new China, Qian Xuesen broke through all kinds of dangers, gave up the superior working and living environment abroad, and returned to the motherland without hesitation for the sake of the motherland's aerospace industry. Madame Curie, the first woman in the world to win the Nobel Prize twice, was named polonium in memory of her motherland Poland. Qian Sanqiang, the father of China's atomic bomb, said: "The history of physics is a treasure land with great spiritual wealth. This treasure land is worth reclaiming and exploring. If we can all attach importance to this treasure land, excavate the precious spiritual wealth, draw nutrition from it, and get lessons, I believe it will be of great benefit to our country's education and personnel training". During the plague swept through London in 1665, Newton continued to study hard at home. In 1687, he published the book "*Mathematical Principles of Natural Science*". It is a book of philosophy of physics. Newton's story covers the spirit of science, dialectical thinking, logical reasoning and other ideological and political contents. Newton explained the virtue of modesty by standing on the shoulders of giants.

2.2 Philosophy of science

Philosophy is a theoretical system of world outlook and methodology. Physics is a subject that studies the most general motion law and basic structure of matter. Physics and philosophy promote and develop each other. Classical physics and philosophy used to be integrated. At that time, scientists were both physicists and philosophers. Einstein's philosophy of science written in Stanford Encyclopedia of philosophy shows that Einstein is not only a great scientist, but also a visionary philosopher. He is very influential in the field of philosophy of science. Einstein objected to Newtonian mechanics and thought that space, time and motion were relative, not absolute. It is Einstein's bold innovation and philosophical thinking that explains the essence of space-time and quantum mechanics. Ernst Mach, an Austrian Czech experimental physicist and philosopher, strongly emphasized the importance of empiricism and positivism in scientific research, which laid a foundation for the development of philosophy of science. Physics itself is a subject of mutual verification and close

combination of theory and experiment. Rigorous logical reasoning, rigorous experiments and scientific attitude of seeking truth from facts are the most basic requirements in physics. In the teaching of relativity and quantum mechanics, we can add some scientific philosophy thoughts such as macro micro, relative and absolute to cultivate students' scientific philosophy.

2.3 Sociology of science

The sociology of science refers to the sociological research on the phenomenon of science. Through the development of the subject, reflect and cultivate students' social values, national pride, social responsibility and so on. Social values are one of the yardsticks to review, observe and foresee the level of social development. In the process of teaching, we can also show socialist core values to students through specific examples in the development of physics. For example, honesty is very important to scientists. If we lose honesty, science will lose its foundation. Honesty is also very important for everyone. Guide students to be honest in life. Stimulate students' national pride and social responsibility. The story of Deng Jiaxian and other scientists dedicated to "two bombs and one satellite" inspires students to be patriotic and dedicated.

3. Conclusion

The purpose of curriculum ideological and political education is to strengthen students' ideological and theoretical education and value guidance. Taking the establishment of morality as the foundation, the education of ideal and belief as the core, and the socialist core values as the guide, we should earnestly grasp the basic construction and basic work in all aspects. The integration of ideological guidance and curriculum education, from the history of scientific development, philosophy of science and sociology of science, runs through all aspects of College Physics Teaching. Give full play to the educational function of all courses and educate people in an all-round way. In the process of imparting knowledge, we should lead the mainstream value, improve scientific literacy, ideals and beliefs, and conduct virtue education.

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