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Exploring the Research and Practice of Teaching Reform of Materials Science Major in Colleges and Universities

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***Abstract*:** The major of materials science is a new major in the early 1990s, and it is the teaching embodiment of the idea of "sustainable development", the society also has new requirements for talents majoring in materials science. At present, the drawbacks of the education mode of materials science major in colleges and universities are gradually revealed. This paper takes the major of materials science major in colleges and universities as an example. First, it analyzes the necessity of teaching materials science major in colleges and universities. Finally, some strategic suggestions for the teaching reform of materials science major in colleges and universities are put forward for reference.

***Keywords*:** College Education; Material Science Major; Teaching Reform; Research Practice; Strategy Suggestion

With the popularization of the new curriculum reform in recent years, the education department requires schools to cultivate talents with all-round development, especially the comprehensive professional ability of contemporary students. Professional ability, lay the foundation for them to enter social work in the future. With the continuous progress of social development, the old-fashioned talent management method has long been out of line with the laws of social development. Therefore, as a student leader, we must constantly start from a new perspective, keep pace with the times, look at problems from a longer-term perspective, and comprehensively explore A set of teaching modes suitable for modern materials science majors are developed. Only in this way can students be cultivated into young people with goals, responsibilities and lofty ideals.

1. The necessity of teaching material science in colleges and universities

Materials science is a discipline that studies the interrelationship between material composition, structure, process, properties and performance, and provides scientific basis for material design, manufacturing, process optimization and rational use. Materials science is an important part of materials science and engineering, and an important link between materials physics and chemistry and materials processing engineering. Mastering the major of materials science can avoid or reduce the negative impact on the living environment in the processing and subsequent use of materials, thereby improving the efficiency of resource utilization. The teaching of materials science can enable students to learn their professional knowledge of materials science while strengthening their own awareness of environmental protection, integrate environmental awareness into the research and development of environmental materials, pay attention to the performance of materials, and inject new vitality into the idea of sustainable development.

At the same time, the teaching of materials science in colleges and universities can not only change the one-sided thinking of focusing on the function of materials in the traditional concept and the wrong concept of developing the economy first and then managing the environment, but also can fully consider environmental pollution and resources on the basis of satisfying performance.

Through the systematic teaching of materials science majors in colleges and universities, the students majoring in materials science can be motivated to solve or alleviate the current environmental pollution problems caused by materials and devote more time and energy toimproving existing materials or developing new environmentally friendly materials to make materials or products more environmentally friendly.

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2. Problems existing in the teaching process of materials science major at this stage

As far as the current form of education is concerned, most mathematics teachers are often too formalized and lack innovative ideas in their daily teaching. They usually copy the theoretical knowledge in the textbook to impart the most basic knowledge, and the cases they use do not follow suit. With the development of the times, it is updated and summarized in a timely manner, but traditional cases are used, which is seriously out of line with the development of modern society, which is very unfavorable to mobilize students' learning classroom atmosphere. In addition, there is a lack of innovative spirit in daily teaching, simple and solid working methods, ignoring students' self-learning ability and talent, not actively practicing education reform, and lack of strong sense of crisis, which eventually leads to students' negative learning attitude.

Secondly, the cultivation of innovative talents in colleges and universities is not enough, and some students have too low requirements for themselves, which makes the talents cultivated by colleges and universities are not irreplaceable. At the same time, the teaching equipment and teaching methods of some colleges and universities have been unable to meet the needs of the development of talents in the society at this stage, and students' learning of materials science is relatively backward.

3. Strategies and suggestions on the teaching reform of materials science in colleges and universities

3.1 Using the Internet to enhance the interactivity of integrated education

The Internet is widely used in all aspects of our lives, and it has also built a platform with a large number of resources for teacher training and education. For example, teachers can be organized to watch training videos from other colleges and universities, and senior teachers can analyze and understand the teaching points of materials science major, so as to promote the teacher group to have a deeper understanding of the deficiencies of their own models, check and fill the gaps and improve their own classroom teaching effect.

3.2 Evaluate students' practical ability in combination with them

In the previous education model, the practical ability of the students majoring in materials science in colleges and universities is not strong, and some teachers also ignore the practical ability of the students, and focus on the learning of the theoretical knowledge of the learning materials. Ability is not high. The concept of diversified evaluation requires teachers to fully understand students, pay attention to the teaching of teaching materials, examinations, and practice, and increase the proportion of procedural assessment in the overall performance, so as to achieve the goal of cultivating and improving students' application ability. For example, teachers of materials majors can encourage and organize students to form study groups, professional course practice clubs, etc., and focus on evaluating students' learning process, not only relying on final grades to determine, in order to improve students' learning efficiency and practical ability.

3.3 Universities comprehensively improve talent training programs

Colleges and universities can only find the best path for cultivating talents if they first clarify the specifications of talent training and the needs of social recruitment of talents. Therefore, colleges and universities should improve the reform of talent training mode, and place the cultivation of students' innovative consciousness at the same level as the cultivation of knowledge and skills. Colleges and universities need to form committees with relevant industries to jointly formulate talent training programs that meet the requirements of social development. At the sametime, colleges and universities need to add innovation and entrepreneurship practice experience to the graduate assessment standards to test the educational achievements of graduates in the process of innovation.

3.4 Build a school-enterprise cooperation and win-win model

College education should improve students' professional cognition. Only through school-enterprise cooperation can the problem of disconnection between theory and practice in the education process be solved, so that students can flexibly display the knowledge they have learned in school through social practice. For example, students can be encouraged to do social internships, let them participate in social work in the form of small groups, let them learn work skills with qualified and experienced workers, and feel the working environment and work content of the major at close range. By learning from the seniors, you can not only deepen your understanding of the knowledge points in the textbook, but also learn knowledge outside the textbook, which broadens their horizons. After completing the practical tasks, colleges can ask each of them to write out their practical experience, including students' career planning direction and industry insights, and then discuss the practical experience, so that students can constantly clarify their own efforts in the process of growth. and enhance their comprehensive professional ability.

3.5 Combine the teaching mode of "promoting research with competition" and establish a scientific evaluation mechanism

Professional competition is an important banner to guide the reform of professional teaching in colleges and universities. Therefore, when organizing the teaching of materials science, college teachers should give a detailed explanation of the rules and regulations of the professional competition and ability requirements to students, and adopt a group model to simulate the competition to guide students to complete each type of project. At the same time, it is necessary to adopt the assessment mode and scoring standard of skill competitions, so that students can fully integrate into the atmosphere of professional competitions and fully experience the fun and professionalism of competitions. The reform of the teaching model of "promoting research by competition" is inseparable from innovative education, so as to cultivate the innovative thinking of the students. Therefore, on the basis of clarifying the teaching focus, teachers of materials science should also evaluate students' learning in various aspects to help them realize their own shortcomings in learning, so as to gradually create a scientific evaluation mechanism.

3.6 Combine the case teaching method and set up a mutual help group

The case teaching method is based on case analysis. The teacher conducts typical analysis of real social cases according to the students' understanding ability and teaching objectives. Teachers can set up mutual help groups in the class, and the class can be linked together. At the same time, teachers can display the case renderings or related teaching materials before the case analysis. Students can quickly understand the details and content of the case through observation, and master operation skills through case analysis.

4. Conclusion

All in all, colleges and universities should strengthen the teaching practice of materials science and innovate the teaching mode on campus, and implement the student-oriented teaching concept. Improve students' interest in learning and practical application ability. In the teaching process, teachers also need to comprehensively consider the impact of various objective factors, ask and solve problems from the students' point of view, and maintain excellent teaching and learning. On this premise, improve their own teaching and research ability, abandon old-fashionedteaching ideas, put students in the main position of teaching, contribute their own strength and actively explore innovation.

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