

Humanistic quality teaching reform of material science

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Abstract. How to play the role of humanistic quality education in Material major courses? This paper discusses the design ideas and specific implementation methods of integrating Curriculum humanistic quality into the teaching of material science from three aspects: curriculum knowledge objectives and ability objective, strategies of curriculum teaching methods, course expected learning results. After humanistic quality teaching reform of the basic course of material science, professional knowledge points and ideological and political elements are integrated, and the teaching platform, students' real feelings and the power of humanistic quality elements are coordinated.

1 Introduction

In order to complete the mission of all-round education of higher education in the new era colleges and universities are currently in the crucial stage of humanistic quality education teaching reform. Material science is the main core course of domestic material majors. It is a basic course that must be learned before entering the major courses, and it is also the basis for the development and research of material science [1]. According to the concept of peer orientation, this paper aims to break the barriers between knowledge disciplines and normative disciplines, integrate the concept of Curriculum humanistic quality into all links of curriculum management and teaching, such as curriculum objectives, curriculum teaching strategies, teaching method design, assessment and evaluation, and achieve the oriented goal of "combining knowledge teaching with value guidance". Build a whole curriculum education pattern [2-5].

2 Objectives of course knowledge and ability

2.1 Knowledge objectives

After learning this course, students are required to be able to describe the basic theories and applications of metals, alloys, ceramics, silicates and other materials. Structure and bonding theory of solid materials, material thermodynamics and phase diagram, types and characteristics of crystal structure, crystal defects, diffusion law and plastic deformation etc.

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2.2 Ability objectives

2.2.1 Integrating core values into professional teaching

Major integrate value shaping, knowledge imparting and ability training to cultivate the safety production awareness, quality awareness, environmental protection and benefit awareness of engineering material students.

2.2.2 Integrating educational elements into course teaching

The scientific integration of ideological education elements makes the teaching content and ideological education elements organically combined and closely linked. This can not only achieve the teaching objectives of professional courses, but also achieve the purpose of ideological education. In the process of integration, it cannot float on the surface, which leads to the independence of teaching content and curriculum quality elements, and the effect of curriculum equality education is very small. It is difficult to complete the professional course content and teaching objectives without excessive implantation and mechanical application.

The ideological literacy construction of this course pays particular attention to the scientific integration of ideological education elements, and strives to find a suitable entry point. Through case analysis, video demonstration, group discussion and other methods, the elements of ideological education are naturally integrated into professional courses so as to truly realize the silent penetration of the content of curriculum quality education.

3 Course teaching methods and strategies

Teaching methods refer to the activity details of teaching methods. Different teaching methods can be included in the same teaching content. It can make teachers' working methods form a unique style and endow teachers with teaching side. Teaching is based on personal characteristics, which affects students' level of knowledge.

3.1 Value leading education

Materials are the symbol of civilization and the progress of the times, so as to strengthen students' understanding and understanding of this major. Through the education of China's long history and culture and splendid civilization, we should pay attention to the education of students' national conditions and the edification of mainstream values.

Introduce the life story of academician Shi Changxu, a famous metal material scientist, into the teaching of iron carbon alloy. Academician Shi is one of the pioneers of superalloys in China. He developed the first iron base superalloy in China and led the development of the first generation of hollow air-cooled cast nickel base superalloy turbine blades in China.

By introducing famous teachers and objects, taking the professionalism of material scientists as an example, students are encouraged to deeply understand the relationship between the professionalism of engineering and technical personnel and China's national conditions and comprehensive national strength. The dialectical relationship between the two can stimulate students' sense of professional honor and dedication [6].

3.2 Enlightenment from engineering application

The starting point of humanistic quality teaching design is to explain the examples of breakthroughs in the research and application of TiAl intermetallics. TiAl intermetallics have

high melting point and light specific gravity. Their brittleness restricts their application in aerospace field.

In the teaching process, taking the world's largest single aperture radio telescope - the Chinese heavenly eye as the starting point, it quickly attracted students' attention with vivid hot words and data. For example, there is a "big pot" in Guizhou, China, with a diameter of 500 meters and an area of up to 30 football fields, where aliens can be found. In this way, the frame structure material behind the reflector unit of fast project is aluminum alloy. Combined with the knowledge points in this chapter, the crystal structure of aluminum is explained. The structure of aluminum is face centered cubic lattice, and there are many slip systems. The possibility of slip is great, and the plasticity of metal is better, so the processing ability is better [7].

3.3 Adopt heuristic and discussion teaching

Combined with the viewpoint that quantitative change leads to qualitative change in dialectical materialism, it shows that more crystal defects are detrimental to the performance of crystal materials.

For example, if two substances diffuse each other, when the content of diffusing elements exceeds the solubility of the base metal, an intermediate phase will be formed on the metal surface as the diffusion proceeds, revealing the second law of Materialist Dialectics - mass mutual change. The change of things starts from quantitative change, and qualitative change is the end of quantitative change. The essence of diffusion is that quantitative change leads to qualitative change.

4 Assessment and evaluation

4.1 Lifelong learning ability

The syllabus of materials science clearly requires that students should be trained to use the basic knowledge of materials to solve practical engineering problems and lifelong learning to adapt to the development of new technologies in the field of materials industry. This lifelong learning and the ability to adapt to the development of new technology is exactly the healthy professional ethics and scientific faith to be guided in the curriculum Ideology.

4.2 eaching supervision and evaluation

Teaching supervision assesses whether the content of the teaching team in the course of humanistic quality education is correct and whether the way of transmitting ideas is effective. Through the interaction between teachers and students, re-evaluate whether students effectively acquire knowledge and improve professional ethics in the process of Education.

4.3 Assess students' effective access

The ability of students' sustainable development after graduation is an important standard to evaluate the success of training talents. In the follow-up survey of students' development through alumni interviews, unit visits, expert discussions, etc, the effect of humanistic quality on students' ability training was investigated as a special project.

4.4 Questionnaire

A questionnaire is a Structured survey is also a kind of questionnaire survey in written communication, The results are convenient for statistica processing and analysis. And we use anonymous students are more willing to show their true ideas, the same as It also well promoted our ideological and political teaching reform.

5 Expected learning outcomes

5.1 Lay a solid foundation of wide caliber

Based on the category of material science. Focusing on the structure of bulk materials, from the micro, macro, material interior and surface and interface, static and dynamic processes. The binding modes and interactions between particles in solid materials. Spatial arrangement characteristic law of particles, aggregate structure, structure.

The relationship between defects and their change rules, surface and interface phases relevant theories and phenomena, as well as the phase equilibrium and phase diagram, diffusion, phase transformation, etc., so that students can understand the composition and structure of materials. There is a systematic and profound understanding and mastery of the internal relationship between understand the basic law of the relationship between the structure and properties of materials, and provide continue to study materials and lay a solid and broad professional caliber theoretical knowledge base.

5.2 Shape character

Through learning, students can master the development law of things, enrich knowledge, increase insight and shape personality. Guide students to establish correct values and cultural values, broaden students' thinking and vision, cultivate students' internal correct traditional cultural cognition, and enhance students' cultural self-confidence, professional self-confidence and professional self-confidence.

Inspire students to aspire to become craftsmen of great powers. Cultivate high-level leaders who are "open-minded, profound, realistic, inclusive and innovative". Usually help students establish good psychological quality. Things are not absolutely good or bad. When they encounter problems in the future, they can think from multiple perspectives.

6 Conclusions

Through the practice of humanistic quality teaching reform in the basic course of material science, integrating professional knowledge points and ideological and political elements, and coordinating the teaching platform, we can enhance the strength of students' true feelings and humanistic quality elements. The combination of Ideological and political teaching points and curriculum knowledge points is not close enough. There is still much room to improve the teaching effect.

In the process of humanistic quality construction in the future, we will thoroughly sort out the contents of textbooks and excavate ideological and political factors, so as to build an organic and unified network of humanistic quality knowledge points.

Curriculum literacy education is the soul of instructional design. We not only learn scientific knowledge and experimental skills, but also obtain enlightenment through objective scientific knowledge through standardized teaching and peer learning. A good life needs to be created through labor. Honesty and trustworthiness is everyone's professional quality. In

the teaching of material science, students should be the center. Cultivate one's moral character and realize the original intention of education.

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