DOI:10.18686/ahe.v7i12.8328

Exploration and Research on the Training Mode of Instrument Specialty Talents from the Perspective of ' New Engineering'

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Abstract: Facing unprecedented opportunities and challenges under the backdrop of the “intelligence +” revolution in a variety of industries, the introduction of a new wave of industrial reform has created a need for China to reconsider its engineering education. new engineering as an opportunity to reform the traditional engineering specialty. As an important carrier to serve the national strategic needs and promote the innovative development of engineering education, the construction of instrument specialty has been raised to a new height. Taking into account the features of instrumentation science as well as the needs of the new engineering structure, this paper examines the present state of talent development in the domain of instrumentation in China. and explores the way of transformation and upgrading of instrument specialty by updating educational concept, changing teaching methods, optimizing curriculum system and carrying out curriculum construction.

Keywords: New engineering ; Teaching mode ; Talent training ; Instrument specialty

Fund Project: University of sanya “Four New” Research and Reform Practice Project
Exploration of “Intelligent +” Instrument Professional Upgrading and Transformation from the Perspective of New Engineering (SYJGSX202248).

1. Introduction

With the continuous deepening of scientific and technological innovation, the country has continuously made major breakthroughs in major scientific and technological fields, the development of traditional industries such as domestic manufacturing, service industry and information technology industry has undergone tremendous changes, and the advantages of “intelligence +” in various industries have gradually emerged. At the same time, in order to achieve economic transformation and upgrading, it is necessary to build bridges and ties between traditional industries and emerging industries, and the demand for instrumentation in various fields will further expand, and the demand for instrument technical talents will also increase.

Due to the specificity of the industry and the problem of talent training mode, traditional engineering majors have been difficult to meet the changes in the training of engineering education talents and needs in the new era under the background of new engineering construction. Therefore, instrument discipline, as an important part of engineering education in the context of “new engineering”, should also receive attention and attention. However, at present, the training of instrument professionals in China has problems such as lagging teaching content, imperfect curriculum system, unscientific assessment and evaluation, and difficulty in finding employment for graduates.

Therefore, this paper combines the “new engineering” to study and analyze the training mode of instrument professionals, and provides some references and references for the construction of instrument professional course system and talent training.

2. The challenges of talent training

Under the background of new engineering construction, the training of instrument professionals is facing more severe challenges, and it is necessary to seek breakthroughs in traditional education models and training concepts, and carry out reforms in teaching

content and teaching methods.

2.1 The main status quo of education-centered has not changed

The traditional education model always emphasizes teacher-centered, ignores the main position of students, and fails to give full play to students' enthusiasm and subjective initiative. Teachers try a variety of blended teaching, such as flipped classroom, "online + offline" mixed, but from the specific implementation data of online teaching, online learning as the "continuation" and "prelude" of the traditional classroom. For some students with poor self-awareness, online courses only replace preview, and do not really learn the course content from online, and more content is completed in traditional classrooms. For students who have developed good learning habits, the use of online teaching can basically complete the relevant content, and when they return to the classroom, they still need the teacher's extended guidance.

2.2 There is a disconnect between theory and practice in the design of the curriculum system

Due to various factors, professional training programs have certain cyclical characteristics, the update speed is slow, and the new content that appears in new technologies and new needs is often reflected in the curriculum system, and some too old content still exists. Secondly, limited by credits, hours and other factors, the ratio of practical teaching and theoretical teaching needs to be improved, especially the proportion of practical teaching in the comprehensive innovation category is too low. In addition, the proportion of modular professional courses is low, although different modules such as compulsory courses, limited elective courses, and optional courses have been formed in the training program, but the modularity in the professional courses has not yet been formed, and the content in some elective courses and professional courses has been duplicated, reducing students' interest in learning, and the professional courses still continue the traditional teaching content, without breaking the barriers between disciplines, integrating new technology content, and it is difficult to form a "new" course.

3. Measures for upgrading and transformation

3.1 Optimize teaching concepts

Student-centered

Implement the "student-centered" teaching idea into classroom teaching, change the teacher-indoctrination teaching mode, and change from teaching to guidance. Emphasize the two-way interaction between teachers and students with student discussion as the main body, ensure full communication between teachers and students, and attach importance to students' sense of participation and acquisition in learning. Students should exert their subjective initiative and calmly cope with the classroom; Teachers need to be guides to stimulate students' creativity and inner potential, and transform the traditional teaching mode into a mode that guides students to discover problems, solve problems, and open up ideas. From the teacher asking the student to the student asking the teacher, so that every student can express their opinions and show themselves[1].

Output-oriented

Under the background of new engineering, based on the output-oriented goal and based on general standards and industry standards, a professional talent training system composed of four dimensions of quality, knowledge, ability and value is constructed[2], Guide students in an all-round way inside and outside the classroom, cultivate students' five basic qualities of tools, major, humanities, personality and action, and form five abilities of healthy personality and career development. Implement the school's concept of "the purpose of entering the campus is to better enter the society", establish an output-oriented talent training model, pay equal attention to knowledge transfer and internalization, guide students to learn the competitive strategy of going to the post and ladder, and cultivate students' comprehensive competitiveness that is welcomed by the society and has social responsibility[3] .

3.2 Improve the curriculum system

The curriculum system is modular

The core of professional transformation and upgrading is curriculum construction, and the curriculum of new engineering majors has the characteristics of interdisciplinary and cross-integration, combining courses of different disciplines in the same module, which can realize the reorganization of interdisciplinary knowledge and break professional restrictions. If the curriculum system is regarded as a system in Haken's synergy theory, each module is a subsystem, and the subsystem is composed of several courses, and the integration of multiple courses within the module is realized[4]. Professional training objectives can be decomposed into multiple independent secondary standards, which can be implemented into modular goals to form independent target points, so as to further refine and decompose into course objectives, and avoid repeated parts between courses in the process of refinement and decomposition Students don't need to repeat learning on the same content.

Dynamic adjustment of professional courses

Modular courses provide students with different course selection resources, students of the same major can take the same credits as required, complete the training program through professional direction selection, combination courses, etc., module courses are relatively independent and have different goals, so as to cultivate engineering and technical talents in the interdisciplinary industrial chain to adapt to different industries. The new technologies required by the industry chain can be reflected in the timely update and adjustment of module courses, and students choose the professional direction and courses they are interested in, which can stimulate students' learning initiative. In addition, teachers should always pay attention to the alternation of industry and technology, constantly update course content in combination with international cutting-edge science and technology, improve the challenge and advanced nature of the curriculum, guide and help students to build their own knowledge system reasonably and scientifically, improve comprehensive ability, achieve diversified development of students, and ultimately match the needs of the industry. According to the needs of the industry and the actual development of the college, the measurement and control major of the School of Science and Engineering will set up four modular courses in the revised professional training plan, including intelligent instruments, intelligent perception, new energy motor technology, and intelligent network technology.

4. Summary

In the era of "intelligence +", traditional teaching methods and models have been impacted, so it is imperative to explore the upgrading and transformation of instrument majors. After research and thinking on the current situation of instrument professional training, it emphasizes student-centered, attaches importance to the cultivation of practical ability and innovation ability, and takes the requirements of new engineering construction as the requirement Guide and review the reform of teaching content and curriculum system, focusing on cultivating students' engineering literacy and innovation ability. Adopt a systematic and complete curriculum system, take the cultivation of engineering practical ability and innovation ability as the core, and build a distinctive curriculum system to achieve cultivation The purpose of comprehensive ability talents.

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