

Research on the Construction of Micro-majors in Applied Undergraduate Universities under the Background of New Engineering

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Abstract: Micro-major is a new talent training program explored by local application-oriented universities under the guidance of new engineering concepts and to better serve the regional economic and social development. It is based on job positions and market demand, and restructures the professional curriculum learning system guided by student career development, promoting the "coupling" and deep integration of professional and industrial development, and improving the quality of talent cultivation. Based on the cutting-edge progress in the construction of micro-majors in the context of new engineering, this study proposes ideas for the construction of micro-majors.

Keywords: New Engineering; Micro-major; Career Development.

1. Introduction

The construction of "new engineering" should carry out open and multi-directional interaction between theory and practice, transform and upgrade traditional engineering majors, explore emerging majors across multiple disciplines, actively deploy talent training to the field of future strategic challenges, and accelerate the training of new engineering talents. The rapid development of industrial technology constantly puts forward new requirements for the adaptability of talent training, and the layout of new majors has a lag. Under the traditional talent training mode, the specifications of talent training are often delayed in the market demand. The contradiction between supply and demand of talent training has become a bottleneck problem that is difficult to break through in the field of higher education for many years.

Micro-major is an important measure based on the comprehensive advantages of disciplines, actively adapting to the needs of new technologies, new formats, new models, and new industries, and accelerating the development of talent cultivation in future strategic areas. It is a beneficial exploration of constructing a new interdisciplinary professional organization model, promoting the integration of disciplines and majors, and promoting the coordinated development of industry, academia, and research. The aim is to reconstruct the professional course learning system based on job positions and market demand, guided by students' career development. By setting up fewer theoretical courses and practical training, students can quickly grasp knowledge and abilities in an emerging technology field and obtain certification for relevant industry and enterprise capabilities.

In recent years, the research and practice of micro-majors have not only improved students' employment competitiveness, but also provided new ideas for promoting the organic coupling and deep integration of professional and industrial development.

2. The Construction Idea of "Micro-major" Oriented to Students' Career Development

The construction of micro-major should combine the sustainable development needs of students' careers and the frontier requirements of industrial technology development. Industrial enterprises and universities should jointly determine the major construction plan, and jointly participate in the construction and development of course resources.

Through the "micro-major" study, students can grasp the frontier development trends of the industry, have the quality and ability of a certain frontier field of technology in short supply, and have the ability of sustainable development for a specific career. The construction idea of "micro-major" oriented by students' career development mainly includes the following aspects:

2.1. Carry out the "Integrated" Training Program Design. Sub-section Headings

From the perspective of the integration of enrollment, training and employment, a new application-oriented talent training mode based on "micro-major" should be established to closely meet the demand for new economic development, and promote the smooth implementation of project-based teaching and the mutual recognition mechanism of diversified learning results should be promoted through the combination of online and offline learning mode.

2.2. Establish an Effective Association with the Relevant Specialties

"Micro" set to establish an effective association with the original school professional, clear the construction of "micro" positioning, give full play to the "micro" talent training flexible precision advantage, make up for the minor professional study time longer, traditional professional construction and local industry demand of choose and employ persons does not match, short-term difficult to solve the contradiction, is a beneficial supplement.

2.3. Establish the Identification System of "Micro-major" and Minor Major

Build the corresponding relationship between the "micro-major" module and the minor major, realize the intersection and openness of talent training, meet the needs of new technology, new industry and new economy for new engineering and technical talents, and realize the training needs of enterprise directional training and the pre-training of industry employment.

2.4. Take into Account the Diversity of Students' Sources

We will improve the diversified "micro-major" certification system for different objects, which can recruit students from the university and the public. Taking career planning as the orientation and emerging technology capabilities as the center, the integration paradigm of "emerging technology + industry certificate + employment opportunities" is established to increase the competitiveness of students in employment, save the employment cost for local employers and achieve a win-win situation.

3. Elements of "Micro-major" Construction

"Micro-major" is a market - and employment-oriented teaching, in order to improve students' practical ability and application skills, to meet the actual job needs and set up. Under this background, it is necessary to define the training objectives according to the needs of enterprise development and students' career development, so as to achieve the precise connection between school talent training and social post needs. The elements of "micro-major" construction are as follows:

(1) Training objectives with career development and social needs as the core. In the process of formulating training objectives, it is necessary to fully investigate the market demand and the development needs of students, fully reflect the principle of "student-centered", and cultivate new engineering and technical talents that meet the needs of modern industry development and meet the needs of students' career development.

(2) Teaching staff of school-enterprise cooperation. It is necessary to introduce enterprise mentors and enterprise resources to give full play to the advantages of school-enterprise integration. At the same time, it is necessary to play the role of industry experts, based on industry alliances, to develop students' hands-on practical ability and provide assistance for students' career development.

(3) Practical and short curriculum system. The course system of "micro major" should reflect the characteristics of precision, short and practical, so as to realize the course refinement, shorten the cycle and highlight the practicality. The curriculum should be set up to combine theory and practice, and through the short cycle of learning, students can master the key knowledge and practical application ability in the field.

(4) Flexible teaching format. "Micro-major" learning belongs to the category of non-academic education, considering that it does not affect the established learning time of students at school, courses are mainly arranged in the evening or weekend time to teach, and the form of teaching is carried out in the form of online and offline. The theory course is mainly online, and the practice course is mainly offline.

(5) Completion requirements. "Micro-major" learning implements the "credit system" teaching, and students who participate in the study can obtain the "micro-major" qualification certificate after completing all the credits of the courses. In addition to the micro-major completion certificate issued by the school, it is recommended to issue the training completion certificate issued by the enterprise or industry alliance, which will help enhance the employment competitiveness of the micro-major completion students.

4. Exploration of Micro-major Construction

4.1. Build a "Six-dimensional" Teaching System

Build a six-dimensional teaching system of "teaching, supervising, learning, practicing, testing and auxiliary", with a multi-dimensional combination to ensure the learning effect and learning feeling, and solve the problems of standardization and individuation in the learning process.

Teaching (interactive teaching): famous teachers live broadcast intensive teaching, theoretical actual combat, knowledge point scene teaching, the combination of teaching and practice, teaching in fun, guide students to master the core skills.

Supervisor (supervisor supervisor): "artificial system" dual teaching supervision service, the head teacher helps students to develop learning habits, stimulate learning interest to lay a solid foundation.

Learning (intelligent learning): Adaptive intelligent learning platform, providing personalized learning solutions according to the differences of students' abilities. Learning modes are diversified, and time is freely controlled, but there is no lack of constraints.

Practice (actual combat drill): actual combat drill is the hard truth, "homework task and projects" guarantee the learning effect, enterprise project drill accumulates valuable experience in the industry, every work of students will become a sharp tool for job hunting.

Test (positioning evaluation): learn a goal, learn a program, phased knowledge assessment, help students understand themselves in all aspects, judge whether to meet the requirements of job skills.

Auxiliary (q & A tutoring): The tutor helps students to check the gaps and fill the gaps, timely answer the difficulties and doubts encountered in the homework and projects, encourage students to communicate and think, and gradually master the knowledge points.

4.2. Carry out "Project Entry Mode" Teaching

Through the "project pass type" teaching, students' learning effect is visible, driving learning behavior, and igniting the interest and passion of learning. A task drive includes three steps: knowledge transfer (knowledge transfer through high-quality recording or live broadcast content) + digestion and absorption (consolidating digestive knowledge through homework or project evaluation) + checking and filling gaps (checking and filling gaps through interactive q & A). Transforming the completion of the Nth task to the completion of the N+1 task into a visible ability enhancement process, making visible progress an intrinsic driving force for continuous learning.

4.3. Create Online Learning Space Resources

By creating online learning space resources, they are used to transfer teaching materials, educational information, update information, and promote the interaction between teachers and students. The course teaching is broadcast live on the online platform, and the recording function is provided to facilitate students to review relevant knowledge points.

5. Conclusion

As an innovative measure to deepen the integration of industry and education, micro-major helps to solve the contradiction between the traditional major setting and the pace of technological development in information communication, artificial intelligence, big data, integrated circuit and other fields and the demand of the labor market, meet the diversified needs of students for employment orientation and interest orientation, and develop students' specific abilities.

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