Exploration and Practice of Provincial High-level Major Group of Computer Application Technology under the Perspective of Industry-Education Integration

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Abstract. In order to fully implement the spirit of the "National Vocational Education Reform Implementation Plan" and other documents, our school is actively exploring the idea of building major group in the process of construction and practice., according to the school's policy of "service-oriented and employment-oriented", and grasping the development trend of the industries in the Guangdong, Hong Kong and Macao Greater Bay Area as well as the demand of economic and social development for various types of professional talents, the school promotes the reform of the teaching mode of industry-teaching integration courses. On the basis of our school's activities to promote the reform of the teaching mode of industry-teaching integration courses, we adhere to the fundamental task of promoting moral education, explore the construction tasks such as curriculum transformation and optimization of teachers under the perspective of industry-teaching integration, accelerate the construction of sub-tasks of each specialty of the specialty group, and make efforts to promote the acceptance of the high-level major group.

Keywords: high-level major group; integration of industry and education; computer application technology major(CATM)；teaching reform

1 Introduction

Our school school is located in Houjie Town, Dongguan City, belonging to the core area of Guangdong, Hong Kong and Macao Bay Area, the CATM major group make full use of the geographical advantages, through close integration with the Dongguan area economic development, give full play to the Dongguan City, such as electronic information and other characteristics of the industry, combined with the need for industrial restructuring and upgrading, and closely centered on the ICT technology and the mobile Internet industry, to serve the Dongguan City local economic construction. In recent years, with the adjustment of ICT, electronic information and other industrial structure and the transformation and upgrading of the industrial chain, the concepts of "digital economy" and "digital twin", "cloud computing" and "big data" have been put forward. With the concepts of "Digital Economy" and "Digital Twin", the rapid development of emerging technologies such as "Cloud Computing" and "Big Data", Dongguan has a broader demand for ICT talents [1]. According to the spirit and requirements of our country's vocational education and industry-teaching

integration related notices and documents, combined with the construction tasks of the provincial high-level major group of computer application technology in our university, in order to adapt to the requirements of ICT technology industry talent training, we actively carry out the construction work of the major group, improve the schooling infrastructure and teaching conditions of the majors, expand the equipping of high-quality educational resources, and intensify our efforts of ICT-related technical skill talent training [2].

The major group with computer application technology as the leader of the provincial key construction of a professional, school-level key construction of a professional, the existing enrollment of 3,599 people, the provincial key construction of CATM as a leader, with animal networking application technology, big data technology, computer networks, software technology and other professional, in order to adapt to the Dongguan regional development, to cultivate the Greater Bay Area shortage of talents, according to the In order to adapt to the development of Dongguan region and cultivate talents in short supply in the Greater Bay Area, according to the implementation method of optimizing and dynamically adjusting the professional structure of the university, the second-level colleges where the major group are located have optimized the relevant disciplines and specialties according to the teacher staffing situation and enrollment in recent years, and stopped the enrollment of telecommunication service and management majors, and added new majors such as IoT major and Big Data major. Focusing on the " industries related to mobile internet application development ", we have subdivided the upstream, midstream and downstream ends of the job chain, positioned and classified the cultivation of four categories of talents, such as "design-development-testing-operation and maintenance" [3], and actively carried out the construction of new-generation information technology majors, to create a new generation of cloud computing, IoT, big data technology, and other related disciplines. To build a practical teaching platform for training ICT skilled personnel in the direction of cloud computing and services, IoT, big data and AI, and to devote ourselves to serving the economic construction and social affairs of Dongguan [4].

2 Positioning

The major group currently has a professional teaching team with reasonable structure, innovative consciousness and strong professional ability. There are 162 full-time teachers, 1 provincial teaching team, 1 outstanding teacher from South Guangdong, 2 outstanding young teacher training candidates, and 6 school-level teaching teachers. The ratio of double teachers is 48%. At present, the teaching staff is relatively stable, and the proportion meets the requirements. The structure of professional teachers' professional titles, ages, and academic qualifications is relatively reasonable, and they have achieved certain results. They won 1 second prize in the provincial teacher teaching ability competition and the first prize in the school-level teaching achievement award. 2 awards, 2 second prizes, 1 third prize, compiled 10 major group series platform course textbooks, built a professional basic public platform, and carried out professional module courses on the basis of the platform. The developed teaching materials are major group A good foundation has been laid for talent cultivation [2].

The major group has complete practical teaching conditions, with 1 provincial-level practical training base, 1 provincial-level public training center, 3 provincial-level off-campus practical

teaching bases, 1 Huawei Information and Network Technology College, and a school-enterprise joint venture There are 7 studios. The studios have fully covered all majors in the group. The majors have advanced practical teaching equipment, provincial training bases, provincial electronic information public training center and Huawei Information and Network Technology College training base create learning conditions for students' practical teaching. The CATM major group led by the CATM has a solid foundation and outstanding construction results, laying a solid foundation for the construction of a new generation of information technology majors [5].

In order to be able to be closer to the local industry and help the construction of ICT-related industries in Dongguan area, the professional cluster of our school, when forming the professional cluster for the industry chain related to intelligent terminal products in Dongguan area, was led by the CATM, and four other related majors, such as the big data major, the software major, the computer networking major, and the IoT application major, were carefully selected. It is closely centered on the vocational job clusters of the ICT technology industry chain in the Greater Bay Area. In view of the nine construction tasks of the provincial high-level major group, we will make efforts to promote the construction of talent training mode, curriculum resources construction and other aspects, so as to ensure that the construction of the major group will be fruitful and effective at the time of project acceptance in 2025, and to cultivate a large number of technical and skillful talents who are in line with the intelligent terminals of the information technology industry of Dongguan City [6].

3 Construction initiatives

3.1 Reasonable grouping

In accordance with the school's policy of "service-oriented and employment-oriented", the school accurately grasps the development trend of industries in Dongguan City and even the Guangdong, Hong Kong and Macao Greater Bay Area, as well as the needs of economic and social development for various types of professionals, and promotes the development of the school in the direction of clustering and specialization. The status and function of each specialty within the cluster in the industrial chain, and the rational setting of related specialties within the cluster [7]. The majors within the cluster adopt a dynamic adjustment mechanism, moderately increasing or decreasing the relevant majors according to the changing trends and needs of the industrial chain development, continuously optimizing the layout of the cluster, and forming a reasonable cluster of majors adapted to the development of the industrial chain.

3.2 Reconstruct the curriculum system

Taking the training of service-oriented talents and the personalized development of students as the fundamental starting point, each major group reconstructs the curriculum system in accordance with the principles of " courses at the bottom level are shared within clusters, courses at the middle level are relatively independent of each major, courses at the top level are electives for each major, and courses at the top level are integrated within clusters. " [8].

The "low-level shared" course group mainly provides general education and platform courses common to major group; the "middle-level separate" course group mainly provides specialized

courses for professional fields; the "senior-level mutual selection" and "top-level comprehensive" course groups Based on improving the comprehensiveness of talent training, the former requires students to take 1 to 2 module courses from other majors in the group, while the latter mainly develops inter-professional comprehensive project courses in the group. Students form inter-major group and, under the guidance of teachers, Gain comprehensive ability training by completing projects independently [9].

3.3 Build major group shared resources

In terms of resource construction of the professional cluster, integrate the original practical teaching resources of the specialties within the cluster, strengthen the construction of internship training bases integrating production, teaching and R&D, develop a number of stable provincial or university-level off-campus internship bases, and improve the level of the application of internship training technology and equipment. A scientific and perfect practical teaching system will be built, and the assessment of practical training will be emphasized with the goal of educating people.

In terms of specific practices, we build a curriculum system based on the comprehensive quality and vocational ability cultivation of students by joining hands with industrial enterprises, integrating vocational qualification standards into professional talent training programs, introducing new achievements and requirements of industrial development and technological advancement in the process of curriculum teaching, and updating the cases of teaching in a timely manner, as well as building a number of high-quality professional basic courses and professional core course clusters, and promoting the organic articulation of the contents of the professional courses with vocational standards and industry standards. At the same time, we create a number of high-quality professional basic courses and professional core course clusters, and promote the organic connection between the contents of professional courses and occupational standards and industry standards. In terms of teaching resources, a number of high-quality online teaching resources are constructed by using the informationization platform and online teaching platform, and the sharing of teaching resources is fully realized through the network.

3.4 Create a high-level teaching team

Establish a team of professional teachers with good ideological quality, high professional level, and reasonable professional structure, age level and academic title structure. The number of part-time technical backbone teachers hired should reach more than 5 per major group, possess intermediate or above technical titles, and be able to solve difficult technical problems. Vigorously invite experts from enterprises and industries to give lectures in our school, make full use of social resources, and hold no less than 2 lectures for each major group every semester; deepen school-enterprise cooperation, use winter and summer vacations to select professional teachers in batches to work in enterprises Practice, no less than 2 months per school year, by hiring corporate technical backbones, cultivating key teachers, and strengthening team building. Provide training on teaching methods to part-time teachers to improve their teaching level; form a standardized and complete management system for part-time teachers, and participate in the development of practical training materials, at least 1 for each major.

4 Construction tasks

4.1 Reform and construction of the three religions

(1) Innovation in talent training model. In the reform of talent cultivation mode, the five majors belong to the university introduce the real projects of the cooperating enterprises through the existing seven school-enterprise co-construction studios which have been completed on campus, and strengthen the dual-education of school-enterprise. In the construction of each major, we make full use of the resources and conditions of Huawei ICT College, Wisers Industrial College and Shenzhen Xunfang Industrial College, and constantly develop and innovate ideas to establish a school-enterprise collaborative education system. At the same time, based on the idea of "all staff, all process, all aspects", we constantly carry out the reform and practice of talent cultivation.

(2) Construction of course teaching resources. In the construction of teaching resources for the major group, we emphasize the main line of students' ability cultivation, integrating related courses, highlighting students' job knowledge and vocational skills training, and at the same time, according to the ideas described earlier: sharing within the group of courses at the bottom level, relatively independent of the courses of each major in the middle level, elective courses of each major in the upper level, and synthesis within the group of courses at the top level, the five majors within the group collaborate in the construction of the curriculum system, and truly realize the interoperability and sharing of the curriculum resources of each major within the group.

(3)Reform of teaching materials and teaching methods. In terms of teaching methods, based on the idea of taking students as the main body, for each course of the professional cluster, project-based and task-driven teaching is mainly adopted to strengthen the requirements for the cultivation of students' comprehensive abilities. In terms of teaching materials construction, each specialty continues to rely on workshops, strengthen school-enterprise cooperation, incorporate real cases from enterprises, and consistently incorporate enterprise projects and real cases in the process of constructing newly developed teaching materials and revamped teaching materials. For teaching materials on design and development, testing, operation and maintenance, and application enhancement of mobile Internet platforms, we will subsequently try to promote the construction of loose-leaf teaching materials, and continue to deepen the construction of digital resources and carry out the construction of microcourse version of teaching materials.

(4) Teacher Teaching Innovation Team. In the construction of teachers, the school constantly increases investment, first of all, builds a perfect reminder in the system, and at the same time, accelerates the systematic cultivation of teachers in multiple ways and through multiple channels. Every year, the school encourages teachers of the major group to participate in governmental provincial and national training programs to improve the teaching level of teachers of the major group in various aspects. At the same time, the school will also make full use of the official training services and teacher training system provided by Huawei ICT Academy in winter or summer vacation every year, and the school will fund and send 4-8 young teachers to participate in the teacher training of ICT technology, increase the teacher training of ICT technology, and improve the teaching ability and professional and technical skills of the professional teachers.

4.2 Base and platform construction

(1) Practical teaching base. The development of information technology is more rapid, therefore, the school will increase the investment to carry out upgrading and renovation works for the implementation of the existing bases, through the construction of shared bases for major group, in order to adapt to the needs of the construction of major group as well as the cultivation of ICT talents. At the same time, the school will increase the cooperation with external enterprises, and continue to increase the investment in the construction of more perfect provincial off-campus practice teaching bases in combination with the needs of students' practice teaching in enterprises and workplaces. Combined with the construction projects of two industrial colleges of the university, the university will promote the construction of training bases for new technologies such as big data and AI, with a view to constructing a more perfect place for internship, practical training and practice for the cultivation of talents of new-generation information technology.

(2) Technical skills platform. The specialties related to the professional cluster fit the development needs of the current enterprises and can effectively promote the development of various technologies. Therefore, the school comprehensively considers the needs of subsequent development and invests more than 3 million yuan to promote the construction of technical skills platform for the professional cluster. It mainly improves the core competitiveness of students' specialties by jointly developing practical teaching platforms and technical skills certification platforms with enterprises, and at the same time builds technical skills platforms that meet the industrial needs of Dongguan City according to the needs of the information technology industry for various types of positions in the direction of Web application development, cloud computing, big data, and the IoT. Schools have also introduced relevant policy support to encourage teachers to participate in various types of technological research and development work in enterprises. Through the technical skills platform, teachers of the group can effectively carry out various types of social service projects.

4.3 Other aspects

The major group organizes some students to conduct credit recognition and course replacement with corresponding majors in colleges and universities in some countries and regions, so as to realize the integration of technical talents with international standards. At the same time, through the school's International Exchange Department, we regularly carry out summer camps in the United States and Singapore, as well as domestic and overseas exchange and cooperation projects in South Korea, Japan, Taiwan, etc., to cultivate talents in major group for international exchanges and cooperation and ensure integration with international standards.

5 Conclusion

In order to realize the leapfrog development, strengthen the connotation construction and enhance the core competitiveness of the school, the school has deepened the teaching reform during the reform and construction of the provincial high-level major group of CATM, and accordingly formulated various systems such as the teaching project construction system,

engineering-learning combination teaching reform system, practice teaching system, faculty construction system, and cooperation system, etc., to refine the construction sub-tasks. The continuous improvement of the school's systems and management methods has provided practical and operable safeguards for the construction and development of the specialty.

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