

Exploration and Practice of Talent Training Mode of "Person-Vocation Fit and Classification Training"

-- Taking the Internet of Things Engineering Major of Guangdong University of Science and Technology as An Example

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Abstract: Guangdong University of Science and Technology, as an innovative undergraduate university with regional characteristics, its Internet of Things engineering major is based on the four characteristics of industrial demand-oriented, interdisciplinary integration, future-oriented layout, and comprehensive and comprehensive innovation under the background of new engineering. The concept of "new methods, new ideas, and new technologies", while giving full play to the strengths and advantages of enterprises and industries, to build an all-round characteristic top-notch innovative education system of "cultivating people with morality and developing simultaneously" with "four-in-one, classified guidance" education model. According to the characteristics and development needs of students, teach students in accordance with their aptitude, and implement the training model of "person-job matching and classification training". Through the analysis of the effectiveness of the implementation of the three-year training model of "person-vocation fit and classified training" in the Internet of Things Engineering major of Guangdong University of Science and Technology, it can be seen that the quality of talent training has been greatly improved.

Keywords: New Engineering, Internet of Things Engineering, Person-vocation fit, Practical Education.

1. Preface

"Person-vocation fit" is a career development theory put forward by American Professor Frank Parsons in "Choosing a Career". Its core idea is that when people make career choices, they should choose the corresponding occupation types according to their own personality characteristics, and carry out reasonable personnel-job matching. The application-oriented undergraduate course under the background of new engineering allows students to go deep into the front-line occupation-related positions of the enterprise to carry out practical learning, truly understand the occupation, realize the organic connection between study and occupation, and improve the matching degree of personnel

and occupation[1][2][3].

Guangdong University of Science and Technology is an engineering-based application-oriented undergraduate institution. Based on the "student-centered" educational philosophy, it conducts an annual survey of students' willingness to graduate. The data shows that 74 percent of students choose to work in enterprises. For these 74 percent of students who choose employment, as shown in Figure 1, through continuous exploration in the past three years, students have a good job, and the quality of their employment has been improved, and an industry-education integration talent suitable for application-oriented undergraduates has been initially formed. That is "person-vocation fit" practice training education mode.

Graduation destination intention

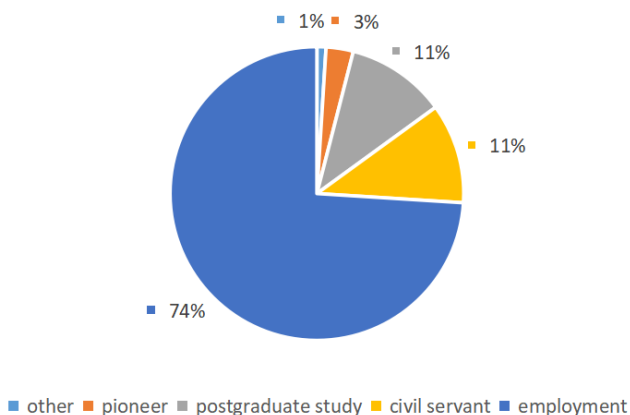


Figure 1. The wish list of graduates of Guangdong University of Science and Technology

The Internet of Things engineering major is set up to meet the needs of the development of national strategic emerging industries. It is an emerging compound major with strong

engineering practice. The disciplines and professional knowledge involved are more complex and advanced. Bring up wide-caliber, high-quality, innovative" compound talents

[4].

Under the environment of comprehensive implementation of innovation-driven and transformational development in Guangdong Province, if the new engineering major still adopts traditional school teaching, it can no longer meet the needs of enterprises through traditional subjects. In addition, if they also adopt the traditional homogeneous talent training method [5], ignore the characteristics of students, and fail to cultivate top-notch innovative talents with various characteristics. In the context of new engineering, the Internet of Things engineering major combines the training of applied talents with regional economic development, comprehensively integrates resources from academia, industry, and society, and establishes high-level applied top-notch innovative classified talents with distinctive characteristics to provide local construction. All kinds of engineering innovative talents serve the local and regional economy.

Since the establishment of the National Internet of Things Engineering in 2010, although the education models formed by major universities have their own characteristics, there are still the following "three heavy and three light" problems:

(1) The curriculum system "emphasizes comprehensiveness and neglects key points": overemphasis is placed on the large and comprehensive curriculum system, and the set talent training plan covers most of the knowledge of the Internet of Things, resulting in shallow and thin knowledge teaching, lack of focus, lack of focus, As a result, students' knowledge system remains on the surface, and they cannot use knowledge to independently design and implement most projects.

(2) The teaching content "emphasizes theory and neglects practice": the course emphasizes the teaching of theoretical knowledge and ignores the cultivation of practical ability. Even if the real practice training stage is still based on imitation and verification experiments, students follow the established steps and norms. Carry out operations to make experimental results qualitatively, ignore the training of students' design ability and innovation ability, and lack the ability to quantitatively calculate and analyze problems.

(3) The education model "emphasizes the whole and ignores the characteristics": it overemphasizes the homogeneous development of all students, ignores the characteristics of the students, fails to provide classified guidance, and forms top-notch classes with various characteristics.

The Internet of Things Engineering major of our school adheres to the "Opinions of the Ministry of Education on Accelerating the Construction of High-level Undergraduate Education and Comprehensively Improving the Ability of Talent Cultivation", "Opinions on Accelerating the Construction and Development of New Engineering and Implementing the Excellent Engineer Education and Training Plan 2.0" and "Dongguan Strategic Government guidance documents such as the "Thirteenth Five-Year Plan" for the Development of Emerging Industries[6]. Under the background of new engineering, focus on the four characteristics of industrial demand-oriented, interdisciplinary integration, future-oriented layout, and comprehensively implement the concept of "new methods, new ideas, new technologies" . At the same time, under the dual guidance of engineering education certification and national professional standards, we will build a top-notch all-round characteristic of "cultivating people with morality,

promoting five educations simultaneously" with "four-in-one, classified guidance" Innovative education model [7][8]. Combine the strengths and advantages of enterprise, school, government, industry to form a progressive "two-line distribution" talent training program oriented towards "intelligent manufacturing and intelligent logistics" for local industry needs, to realize the classification and training of students, forming The hierarchical and progressive education model of ordinary classes, characteristic innovation classes, and "3+1" top-notch innovative talent classes, as shown in Figure 2, explores an excellent talent training path for application-oriented undergraduate colleges to serve regional industrial and economic development. It has certain guiding significance for the exploration of talent training for new engineering majors in application-oriented colleges and universities.



Figure 2. The talent training model of government-school-industry-enterprise collaboration

2. Solution Strategy and Implementation Method

2.1. Establish A Progressive "Two-Line Split" Course System with The Direction Of "Intelligent Manufacturing and Intelligent Logistics"

Deepen the integration of production and education, promote the precise connection between disciplines and industry needs, promote the organic connection between the education chain, the talent chain, the industrial chain, and the innovation chain, and build a "person-vocation fit" practice education talent training system [9]. Under the background of new engineering, the Internet of Things engineering major is oriented by industrial needs, interdisciplinary integration, future-oriented layout, and comprehensively highlighting innovation. Under the dual guidance of professional standards and engineering education certification, a progressive "two-line split" course system with the direction of "intelligent manufacturing and intelligent logistics" is established (as shown in Figure 3). On the one hand, the course highlights the opening, penetration and coverage of the three-layer architecture of the Internet of Things system, on the other hand, the course highlights the two-way knowledge

requirements of "intelligent manufacturing and intelligent logistics". A dedicated laboratory has established a curriculum teaching team with responsible professors as the

core, and implemented the PBL project-driven teaching method.

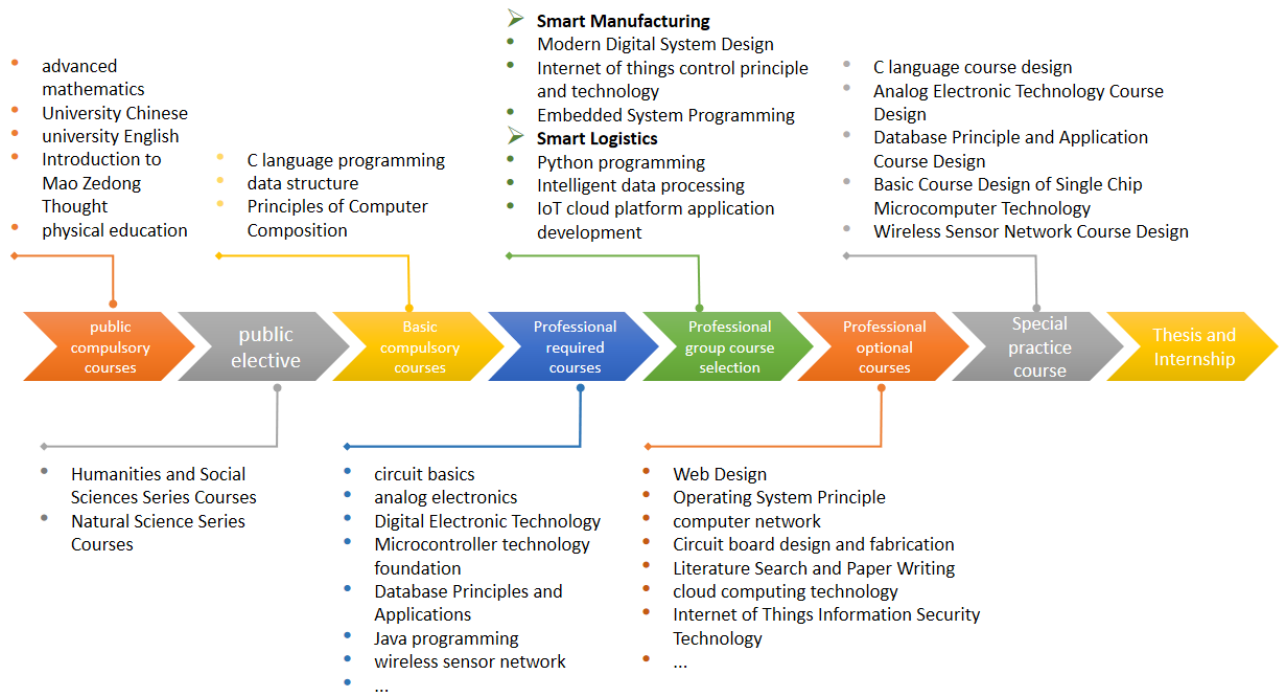


Figure 3. IoT Engineering Curriculum System

2.2. Implement School-enterprise Collaboration, Build A "Five-Level Progressive" Model, And Strengthen Innovative Practice Teaching

Relying on the College of Industry, the Provincial Engineering Technology Research Center and the Provincial University Student Experimental Training Base. We will build projects as the core, which take into account the

coordinated development of in-class and extra-curricular, and coordinate in-class experiments, practical training (whole week training), professional competitions, and projects. The "five-level progressive" course experimental teaching mode of R&D and innovation and entrepreneurship; formed a double closed-loop structure of collaborative training inside and outside the classroom, and created a course content system with "fine courses and strong experiments" [10] (as shown in Figure 4).

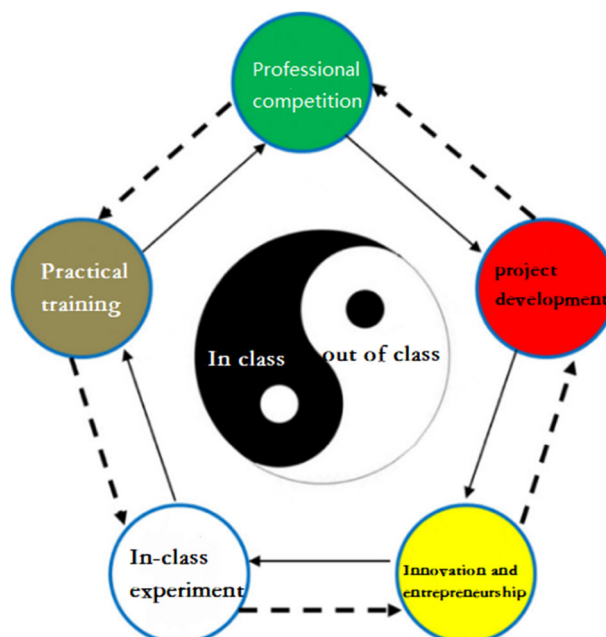


Figure 4. Practice ability training model

2.3. Adhere to the "Five Education at The Same Time", Implement Curriculum Ideology and Politics, Implement "Personnel-job Matching, Classification Training", And Realize Teaching in Accordance With Aptitude and Individualized Training

The whole school adheres to the idea of cultivating people by virtue, and at the same time implements the "five education at the same time" training model, each student who implements the major has a five education tutor and a five education platform account; implements ideological and political education combining ideological and political teachers combining professional teachers. way to achieve a comprehensive ideological and political course with curriculum ideological and political education. "Personnel-professional matching, classified training" implements the "four mentors" of ideological and political mentors, professional mentors, vocational mentors and corporate mentors. Guide students in career planning, professional learning, subject competitions, project research and development, postgraduate entrance examinations, public examinations and other activities, and implement the general class, innovation class, "3+1" top class classification training project, and realize the true sense of teaching students according to their aptitude, classification Cultivation, highlighting the individualized training of students.

3. Implementation Effect

With the government's macro-level policy support for the integration of production and education, in the context of new engineering, it is the only way for the Internet of Things

Engineering major of our school to practice "industry-education integration, classified training" and improve the quality of talent training. These documents issued by the government clearly require that colleges and universities promote collaborative education between schools and enterprises, promote the precise connection between disciplines and industry needs, promote the organic connection between education chains, talent chains and industrial chains and innovation chains, and improve the supply side and industry demand side of talent training. The dislocation ("industry-academia dislocation") in terms of structure, quality and level [11][12].

After three years of exploration, the Internet of Things engineering major has achieved certain results under the practice of the school's "person-vocation fit" practice education model. In 2019, 2020, and 2021 (currently in the implementation of school-enterprise collaborative education, the data is not yet comprehensive), the Internet of Things Engineering major has selected 31, 43 and 46 students to participate in one-year practical teaching. The situation is shown in Table 1. Through one-year practical study in the enterprise, the students' enterprise job competency and employment competitiveness have been significantly enhanced, and the employment salary level has been significantly improved. A survey of graduates who participated in practical education in IoT engineering in 2019 found that their salary level was more than 2,000 RMB higher than that of graduates who did not participate in practical education, specifically 2,153.2 RMB higher. In 2020, the Internet of Things engineering major, the employment guidance center surveyed The average salary of students participating in practical education is 7,000 RMB, which is 3,359 RMB higher than the average salary. Specifically as shown in Figure 5:

Table 1. The specific implementation of the last three sessions of the Internet of Things engineering major

| serial number | grade | joint venture | number of people | cooperation method |
|---------------|-----------------|---|------------------|--------------------|
| 1 | session of 2019 | Guangzhou Yue Embedded Communication Technology Co., Ltd. | 31 | entrusted training |
| 2 | session of 2020 | Guangzhou Yue Embedded Communication Technology Co., Ltd. | 44 | entrusted training |
| 3 | session of 2021 | Guangzhou Yue Embedded Communication Technology Co., Ltd. | 46 | entrusted training |

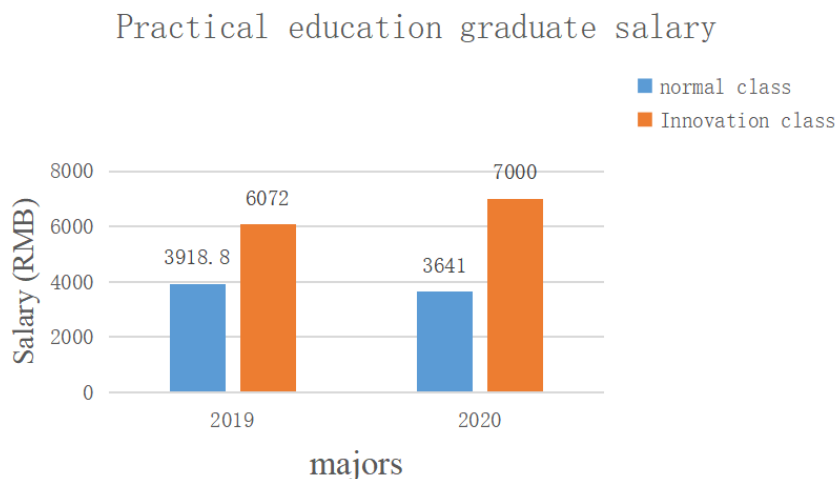


Figure 5. Comparison of the salaries of graduates in 2019 and 2020 in school-enterprise collaborative education

4. Summarize

Under the background of new engineering and the macro level of the government's policy of integration of production and education, it combined with our school's "person-vocation fit, practice education" idea, which the Internet of Things engineering major combines the strengths and advantages of enterprise, school, government, industry to form a progressive "two-line distribution" talent training program oriented towards "intelligent manufacturing and intelligent logistics" oriented to the needs of local industries, realizes the classification and training of students, and forms ordinary classes, characteristic innovation classes, and "3+1" top-notch innovations. The hierarchical and progressive education model of the talent class. From the quality of talent training in the past three years, it can be seen that the quality of student salaries, employment, and entrepreneurship in school-enterprise collaboration and practical education is much higher than that of the ordinary class training model. The following research can allow the majors to combine the mode of modern industrial colleges to carry out multi-angle and in-depth reform of the school-enterprise collaborative practice education model, and further improve the quality of training talent for Internet of Things engineering.

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