Taking Multiple Measures to Promote the Construction of Computer Science and Technology Specialty

Fengjun Shang

College of Computer Science and Technology, Chongqing University of Posts and telecommunications, Chongqing 400065, China
*Corresponding author. Email: shangfj@cqupt.edu.cn

ABSTRACT

This major uses the concept of "quality first and characteristic development", based on the national innovation driven strategy and the "double first-class" construction, deeply implements the spirit of the national education conference, adheres to the "people-oriented", promotes the "four returns", strengthening the connotation construction, and focuses on promoting the curriculum system, teaching resources, training mode The comprehensive reform of the teaching staff will promote the overall improvement of talent training level. Optimize the curriculum system in combination with the national and Chongqing information technology industry development strategy. Carry out the construction of teaching resources and build multi-dimensional, three-dimensional and open teaching resources. Explore the reform of talent training mode, and take the implementation of excellent engineer training plan and engineering professional certification as an opportunity to deepen the reform of talent training mode of excellent engineers in the fields of Internet Engineering and big data. Actively absorb talents and optimize the teaching staff. Graduates mainly serve in the media/information/communication field, and the overall satisfaction of employers with graduates is 98%.

Keywords: Curriculum system, Training mode, Teaching staff, Comprehensive reform.

1. INTRODUCTION

Founded in 1950, Chongqing University of Posts and telecommunications is a teaching and Research University jointly built by the Ministry of industry and information technology and Chongqing city with a complete talent training system of " bachelors-masters -postmasters". At present, the university has more than 20000 undergraduates, more than 1900 in-service teaching staff, 59 undergraduate majors, 3 "double first-class" disciplines in Chongqing and 14 key disciplines in Chongqing. In the fourth round of national discipline evaluation, there are two B+, two B- and two C+; It has won 65 national undergraduate teaching projects and 4 national teaching achievement awards. The university leads the professional construction with professional certification, forming the institutional framework of professional quality certification and the quality culture focusing on improving the level of talent training. The employment level of students ranks in the forefront of similar colleges and universities, and it is a typical university with employment experience for graduates in China.

2. PROFESSIONAL DEVELOPMENT

Chongqing University of Posts and Telecommunications began to recruit undergraduate students majoring in computer communication in 1985 and added computer and application in 1995. In 1998, the two majors were merged and adjusted to computer science and technology. Since 2011, it has implemented the enrollment and training of major categories of computer and intelligent science. It recruits students online or in key batches in nearly 30 provinces and cities across the country, with about 500 major categories each year, about 200 students majoring in computer science and technology are diverted every year.

Computer science and technology was rated as Chongqing characteristic specialty in 2005 and national characteristic specialty construction site in 2009. In 2012, it was selected into the education and training plan for excellent engineers of the Ministry of education. In 2013, it was approved to join the excellent undergraduate international exchange program of the overseas study Fund Committee. It was selected as

Chongqing first-class specialty in 2018 and national first-class specialty in 2021.

This major has built a number of high-quality curriculum resources, such as national bilingual teaching demonstration courses, brand courses taught in English by the Ministry of education in China, Chongqing high-quality courses, Chongqing resource sharing courses and so on. Through the special fund of the central government, it has built practical platforms such as intelligent terminal, cloud computing and network security, and has been rated as the experimental teaching demonstration center of colleges and universities in Chongqing; Cooperate with ZTE, Oracle, Cisco, Qihu 360 and other enterprises to build a national engineering practice education center and ICT industry education integration innovation base of the Ministry of education. It won 2 second prizes of national teaching achievement and 1 first prize of Chongqing teaching achievement.

This major has built a student-centered undergraduate teaching quality assurance system, strengthened the continuous improvement mechanism of teaching quality, and the average employment rate in recent three years is more than 91%. The survey shows that the graduates of this major are affirmed by the employer.

3. TAKE MULTIPLE MEASURES FOR PROFESSIONAL CONSTRUCTION

This major adheres to the concept of "quality first and characteristic development", takes strengthen morality education as the people-oriented, bases on the national innovation driven strategy and "double first-class" construction, faces the information and communication industry, and cultivates technical or business backbone with solid computer basic theory and strong engineering practice ability and innovation consciousness in application system design and development, data analysis and processing. We will thoroughly implement the spirit of the national education conference, adhere to the "people-oriented", promote the "four returns" [1], strengthen the construction of connotation, focus on promoting the comprehensive reform of curriculum system, teaching resources, training mode and teaching staff, and promote the overall improvement of talent training level.

3.1. Deepen the comprehensive reform of specialty

Optimize the curriculum system in combination with the national and Chongqing information technology industry development strategy. Strengthen the teaching of basic knowledge and skills and the cultivation of basic quality, pay attention to students' core knowledge

and core abilities such as software and hardware, network, data and intelligence, and build a "two-dimensional, three-level and multi module" practical teaching system throughout the whole process of talent cultivation [2]. Set up innovation and entrepreneurship credits, and recognize the credits of various scientific and technological competitions at all levels, scientific research activities, innovation and entrepreneurship training, skill certification and other activities participated by students. We will promote the reform of the teaching organization mode of "combination of courses and competitions", strengthen the organization of high-quality events such as program design, database and intelligent terminal, and improve students' ability to innovate and practice, communicate and question. Integrate ideological and political education into the professional system and guide students to practice socialist core values.

Actively carry out the construction of teaching resources and build multi-dimensional, three-dimensional and open teaching resources. Strengthen the construction and utilization of various online courses such as course center and MOOC, actively carry out the reform of flipped classroom teaching mode, and introduce high-quality MOOC auxiliary teaching such as wisdom tree and University State for a large number of programming and computer basic courses [3]. For the cutting-edge courses of big data, intelligent information processing and other disciplines, independently develop the MOOC "big data analysis and processing" and actively promote its application. We strengthened the construction of high-quality teaching materials and built a series of teaching materials including program design, data management and analysis, network engineering and system structure. It has won special funds from the central government for many times, built practice platforms such as intelligent terminals, cloud computing and network security, cooperated with ZTE, Cisco, Qihu 360 and other enterprises, and built a national engineering practice education center and ICT industry education integration innovation base of the Ministry of education.

Actively explore the reform of talent training mode. Cooperate with scientific research institutes, enterprises and parks to build an advantageous professional practice platform, introduce rich resources such as projects, products, tools, cases and data, and realize the organic integration of industrial technology system and discipline knowledge system. Strengthen international exchanges and cooperation, promote the construction of bilingual courses and all English teaching courses, set up all English International classes for this major, and improve the international school running level [4]. Promote scientific research back feeding teaching, take the scientific research base as a platform for students' innovation and practice, transform scientific research

achievements into professional teaching resources, and improve students' scientific literacy and innovation consciousness. Take the implementation of excellent engineer training plan and engineering professional certification as an opportunity to deepen the reform of excellent engineer talent training mode in Internet Engineering, big data and other fields.

3.2. Strengthen the construction of teaching staff and grass-roots teaching organizations

Teaching staff and grass-roots teaching organizations are the key to high-quality undergraduate education. This major strengthens the quality improvement of team scale through the combination of introduction and training.

The university has made use of Chongqing's talent introduction plan, the thousand talents plan, the millions of talents and other policies to strengthen the introduction of leading talents and double qualified talents, introduce academicians, national experts and scholars, provincial and ministerial experts and scholars and outstanding doctoral candidates at different levels, and constantly optimize the structure of the teaching team. Set up a teacher development center to coordinate the implementation of teachers' training and further education, level improvement, professional consultation, ability diagnosis, experience exchange and career planning.

According to the talent introduction system, the college implements the method of open recruitment of full-time teachers, visits relevant colleges and universities, actively publicizes the introduction policy and attracts excellent doctors at home and abroad [5]. At the same time, teachers are sent for training and further study from time to time to support young and middle-aged teachers to take temporary training in enterprises, study and visit at home and abroad.

Strengthen the construction of departments and curriculum groups, and guide teachers to take teaching as the key and scientific research as the basis for coordinated development. In combination with specialty construction and curriculum construction, organize and guide teachers to apply for teaching research projects, carry out teaching reforms such as teaching methods and means and curriculum content, and carry out teaching and research activities regularly. New teachers are equipped with tutors and arranged to join the scientific research team to encourage scientific research achievements to enter the classroom.

The professional construction team of computer science and technology is a national teaching team and one of the top ten outstanding youth groups in Chongqing. The middle and senior professional titles of team teachers account for 74% and doctors account for 79.6%，including national talents, provincial and

ministerial talents such as the distinguished professor of "Changjiang Scholars" of the Ministry of education, the national candidate of the "new century ten million talent project" of the Ministry of human resources and social security, and the young and middle-aged scientific and technological innovation leading talents of the "innovation talent promotion plan" of the Ministry of science and technology.

3.3. Strengthen the construction of professional teaching quality assurance system

The major has strengthened teaching management and organizational guarantee, strictly implemented the rules and regulations such as the quality standard for major undergraduate teaching links of Chongqing University of Posts and telecommunications, the norms for undergraduate teaching of teachers of Chongqing University of Posts and telecommunications, and the implementation rules for two-level undergraduate teaching supervision of Chongqing University of Posts and telecommunications, and established a "three-level, multi-dimensional and closed-loop" teaching quality guarantee system, It has improved the construction of teaching quality assurance management team and system, played the role of colleges, departments (departments and centers) in the process of teaching quality assurance, and ensured the teaching quality.

Focusing on the quality of talent training and clarifying the quality standards of theoretical teaching, practical teaching, practical training teaching and graduation design (Thesis), the college has set up teaching guidance sub-committee, degree sub-committee, college teaching supervision group and department (Department and center), which are responsible for the determination of training objectives, the formulation of training programs, the setting and revision of curriculum system, etc, And complete their respective management responsibilities in the quality of education and teaching. Strengthen the teaching process (teaching evaluation, supervision, student feedback, etc.) through the teacher's evaluation of the teaching process [6]. Collect teaching information from different angles of peer teachers, teaching supervisors, teaching managers and students, timely find the problems existing in teaching and teaching management, take students as the center, continuously improve the training objectives, graduation requirements and curriculum system, and improve the training effect.

The teaching quality assurance system of this major makes the teaching run smoothly, the process standardized, the learning evaluation and teaching excellent, and realizes the effective feedback of teaching quality monitoring information and the continuous improvement of teaching quality.

4. GRADUATE TRAINING QUALITY

In order to improve the teaching quality and promote the teaching reform and connotation improvement of this major, the college organizes professional principals, counselors and course teachers to listen to the opinions and suggestions of graduates and visit industrial enterprises and brother colleges by issuing questionnaires, visits, seminars and other forms.

Graduates and alumni of this major have a discussion every year to track the implementation effect of the training program and the achievement of graduates' ability. Conduct irregular social surveys through a third party to track the training quality of employers and graduates. Among employers, students mainly serve the media / information / communication field, which meets the professional positioning and talent demand of Chongqing. The overall satisfaction of employers with graduates is 98%.

This major conducts an annual survey on Graduates' ability achievement and satisfaction through issuing questionnaires. In recent three years, the professional ability has reached more than 85%, which reflects that students can comprehensively use relevant knowledge to solve complex engineering problems; Employment satisfaction was 96.8%, personal comprehensive quality and professional quality had a competitive advantage of 93.6%, professional core knowledge and professional skills had the ability to solve complex engineering problems of 85.6%, and talent training orientation met the needs of society and enterprises of 92.8%; The achievement degree of training objectives is consistent with the evaluation results of employers, with an average of more than 80%; The recognition of training objectives is more than 88%; The employer's final recognition of the training objectives is more than 86%. The average employment rate of graduates in recent three years is more than 91%, indicating that the training goal has been recognized by the information and communication industry and is in line with the development of information technology industry in Chongqing.

5. CONCLUSIONS AND FUTURE WORKS

This major fully implements the spirit of a series of speeches such as the national education conference, adheres to establish morality and cultivating people, and realizes "three complete education". Based on the information and communication industry, serving the local economic construction, relying on the first-class discipline advantages of computer science and technology, adhere to the open school running, strengthen the construction of professional connotation such as curriculum system, teaching staff and teaching resources, deepen teaching reform and improve the quality of talent training.

Optimize the curriculum system. Analyze the development of the information industry. In the new version of the training program, pay attention to the cultivation of basic knowledge and basic skills, support the talent needs of computers, Internet, cloud computing, big data and artificial intelligence in Chongqing, strengthen innovation and entrepreneurship education, innovate the practical teaching mode, run the practical teaching through the whole training process, improve the curriculum ideological and political education, and cultivate people with patriotism and dedication Honest and trustworthy, broad-based, professional and profound, systematic knowledge of morality, intelligence, physique, beauty and labor.

Enrich teaching resources. Make use of discipline construction and first-class majors to increase financial support, and encourage teachers to compile characteristic and high-level professional teaching materials in combination with specialized characteristics. Relying on the laboratories, innovation bases and resource platforms jointly built with IBM, Cisco, telecom, China Mobile, China Unicom, ZTE, Qihu 360 and other enterprises, we will strengthen the construction of high-quality educational resources, give full play to the maximum efficiency in innovation and entrepreneurship projects, discipline competitions and graduation design, and strengthen the construction level of gold courses with depth, difficulty and challenge.

Increasing openness and cooperation. We will improve the training platform for teachers and institutes of higher learning in Chongqing, improve the training platform for teachers and institutes of higher learning, and improve the training content and practice ability of colleges and institutes of higher learning in Chongqing.

Deepen teaching reform. Take engineering education as the starting point, encourage teachers to undertake the reform of teaching contents, methods and means, improve students' awareness of large-scale engineering and engineering practice ability, and promote the construction of new engineering subjects. Actively participate in the "pilot project of engineering education reform" and the "excellent engineer training plan", improve the engineering practice ability of engineering students, and fully implement the "six excellence and one top" plan. Carry out the exploration and practice of international talent training mode, and cultivate students' awareness and ability to take part in international competition.

Strengthen the teaching staff. Make use of the identification methods of "Wenfeng talent project" and "high-level talents", build a team of high-level leading talents and their reserve talents, train young and middle-aged backbone teachers, encourage teachers to take temporary posts in enterprises in the information and communication industry, improve teachers'

engineering practice ability, and deepen the integration of industry and education.

ACKNOWLEDGMENTS

REFERENCES

[1] Zhang liangyue, Guo suling, Yang Qun. How to implement the "four return" in local universities [J]. Journal of Anyang Normal University, 2018, (4): 123-127. (In Chinese)

[2] Lu Yiyao. Discussion on teaching methods of computer software application courses [J]. Green technology, 2019 (23): 13-14. (In Chinese)

[3] Liang Enxiang, Li Lulu, Liu Lichao, et al. Online teaching practice of organic chemistry course based on "Tencent conference + Classroom school" [J]. University chemistry, 2020, 35 (5): 109-114. (In Chinese)

[4] LAN Guoshuai, Guo Qian, Zhang Yi, et al. Macro trends, technical practices and future scenarios affecting future higher education teaching: key points and thoughts of 2020 EDUCAUSE horizon report (teaching edition) [J]. Open education research, 2020, 26 (2): 27-39. (In Chinese)

[5] Wang Xudong. Post epidemic "school examination": a special "physical examination" [J]. China examination, 2020 (4): 76-78. (In Chinese)

[6] Zou Yuanyuan, Li Chengjun, Xie youru. Construction and implementation of "bay area model" for online teaching in Colleges and universities during the epidemic period [J]. China audio visual education, 2020 (4): 22-28.(In Chinese)