ISSN 2706-6827 Vol. 3, Issue 13: 68-72, DOI: 10.25236/IJFS.2021.031311

Innovation and Practice of Teaching System of Vocational Education Normal Majors -in the Case of Automation Major of Jilin Engineering Normal University

Long Chen[1,2], Xiao Qin[1*]

[1]School of Electrical Engineering, Jilin Engineering Normal University, Changchun 130052, Jilin, China
[2]College of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou 310058, Zhejiang, China;
79730568@qq.com
**Corresponding author*

Abstract: *As the importance of vocational education continues to rise in China, there is a need of excellent teachers for the vocational education who meet the requirements. This article takes the automation major of Jilin Engineering Normal University as an example and elaborates the innovation and practice of the practical teaching system of excellent vocational education teacher training. It includes the professional orientation, history and characteristic advantages of the major, the main initiatives and effectiveness of the reform of the major, the main initiatives and effectiveness of the construction of the teaching team and the basic teaching organization, the main initiatives and effectiveness of the construction of the professional teaching quality assurance system, the results of the tracking survey and external evaluation of the training quality of graduates, and the main ideas and initiatives for the next step of promoting the construction and reform of the major. The research results provide references for the construction of teaching reform of related majors.*

Keywords: *vocational education, major construction, automation major, engineering normal major*

1. Introduction

Since 1979, when Jilin Engineering Normal University (JLENU) was founded, the automation major has been enrolling students, and it is the unique major that trains teachers for electrical technology and application and other related majors in northeastern of China and Inner Mongolia.

The teaching and research department of automation major follows the growth path of vocational education teachers, explores the law of sustainable development of automation profession, and creatively puts forward the new theory of "three - three - three" development of excellent vocational education teachers. In other words, it follows the philosophy of "resource sharing and collaborative education", proposes the new model of "collaborative education of 'school-enterprise-school' and three-dimensional design of one-two-three classrooms" for teacher training, and relies on the reform project of teacher training in secondary vocational schools of excellence of the Chinese Ministry of Education. The experimental class of teacher training for excellence in vocational education in automation has been established to promote comprehensive reform of teacher education. Following the teaching concept of "unity of knowledge and practice, integration of science and practice", a new curriculum structure of "three platforms + nine modules" was built [1].

The automation major has been successfully approved as the reform project of the excellent teacher training program of the Ministry of Education of China, provincial specialties major, undergraduate brand specialty construction point of Jilin Province, provincial high-level specialty, two national teaching achievement awards, one first-class award, one second-class award and two third-class awards of Jilin Provincial Teaching Achievement Award, and one national high-quality resource sharing course section.

So far, the automation program has trained nearly 300 high-quality vocational teachers who are passionate about vocational education, have high moral character, outstanding skills, excellent teaching,

ISSN 2706-6827 Vol. 3, Issue 13: 68-72, DOI: 10.25236/IJFS.2021.031311

and focus on innovation, among which more than 30 have become famous teachers and leaders of vocational education in Jilin Province.

2. The Main Initiatives and Effectiveness of the Major Reforms

Since 2013, the automation majors have established an experimental class for excellence in vocational education training (VET) teacher training based on the Ministry of Education's Excellence in Secondary Vocational School Teacher Training Reform Project and implemented large-scale teaching reforms, focusing on the theory of excellence in secondary teacher development, talent training model and talent training system reform, aided by teaching quality assurance and resource assurance reform, to continuously promote teaching reforms with fruitful results.

In the past five years, the automation major has been approved more than 30 teaching reform projects at provincial and ministerial level, including 7 projects of talent training mode, 3 projects of curriculum system, 8 projects of teaching method and resource construction, and 6 projects of integration of science and practice. It has won 2 national teaching achievement awards, 1 first-class award, 1 second-class award and 2 third-class awards of Jilin Provincial Teaching Achievement Award, some of which have been promoted in the province or other universities.

Firstly, we put forward a new theory of " 3-3-3" development of excellent secondary teachers. That is, the "3 stages" of cultivation, training and nurturing, the "3 levels" of making teachers exemplary, strengthening teachers' ability and casting teachers' souls, and the "3 strategies" of cultivating thinking and politics, training thinking and politics and nurturing thinking and politics. It has also developed a mechanism for the training of both moral and technical skills, so that ideological and political education can be carried out throughout the process of training, training and cultivation, which has highlighted the characteristics of the school, and has been a driving force for similar institutions [2].

Secondly, we proposed a new model of VET teacher training talent cultivation of "'school-enterprise-school' collaborative education, one-two-three classroom three-dimensional design". It has established the experimental class of VET teacher training with the participation of industry and enterprises, and introduced more than 10 documents such as training program, curriculum system, implementation process and teaching evaluation. The students of the experimental class have significantly improved their professional ability and teaching ability from teachers, and their practical ability and innovation and entrepreneurial ability have been significantly enhanced [3].

Thirdly, we proposed a new curriculum construction of "3 platforms + 9 modules" for VET teacher training based on school-enterprise school open education platform. Three training platforms, namely, general education platform, professional education platform and teacher education platform; nine curriculum modules, namely, humanistic, professional and academic literacy, professional basic knowledge, professional core competence, professional skills practice, teacher education theory, professional education competence and teacher practice. The system breaks the traditional subject curriculum system and develops job-oriented courses. Taking the cultivation of comprehensive vocational ability and professional teaching ability as the core, it integrates theory with experimental, practical training and internship teaching links. The core courses of each profession organize course content with projects as the logical main line, and realize the integration of training courses through the combination of different module courses [4, 5].

3. Main Initiatives and Effectiveness of Improving the Level of Faculty and Basic Teaching Organizations

3.1. Through the Leading Role of Famous Teachers, We Actively Introduce Outstanding Talents

There are 13 full-time teachers, including 7 with senior titles, accounting for 54%, 4 with intermediate titles, accounting for 31%, 5 with doctoral degrees, accounting for 38%, 8 with master's degrees, accounting for 62%, and 9 with double-teacher type teachers, accounting for 69%. In addition, part-time teachers are provided from enterprises and secondary schools, and the ratio of full-time and part-time teachers reaches 1:10. Meanwhile, the program actively introduces talents with doctoral degrees and senior titles according to the development needs, and 3 doctors were introduced from Jilin University and other famous universities in 2018.

ISSN 2706-6827 Vol. 3, Issue 13: 68-72, DOI: 10.25236/IJFS.2021.031311

3.2. Pay Attention to the Growth of Young Teachers and Implement the Growth Plan of Young Teachers

We implement a mentorship system for young teachers within three years of joining the university, help young teachers grow through the role of senior teachers, solve outstanding problems in the life and career development of young teachers, improve the induction training for new teachers, strictly enter the system for new teachers, and provide good conditions for the career development of young teachers and the improvement of scientific research and teaching ability through policy inclination, study and exchange abroad, training, organizing teaching skills competitions for young teachers, and holding salons for young scholars. We provide good conditions for the career development of young teachers and the improvement of their research and teaching abilities.

3.3. The Experimental Class of Vet Teacher Excellence is Established and the Management of the Triple Mentor System Is Implemented.

The three mentors are composed of professional, vocational school and enterprise mentors. The students of the experimental class enter the research team of the tutors, and under the guidance of the tutors, they participate in relevant scientific research, competition and training of vocational ability from teachers, and organize activities of scientific research, teaching and research, thesis guidance, innovation and entrepreneurship, as well as discipline competition. These initiatives have alleviated the problems of separation of teaching and research, little contact between students and teachers, and blindness in learning, and have achieved good results in discipline competitions and research examinations [6].

4. The Main Initiatives and Effectiveness of Strengthening the Construction of Major Teaching Quality Assurance System

4.1. Putting Ideological and Political Construction and Moral Education in the First Place.

We give full play to the role of Civic and Political Science courses, strictly require teachers to shoulder the function of educating people in all courses, everyone speaks about educating people, there is moral education in every course, create a good atmosphere of educating people in all staff, all-round education and the whole process of educating people, around the teaching objectives of value shaping, ability cultivation and knowledge transmission, so that value leading and knowledge transmission complement each other.

4.2. Improve the Teaching Management Level By Improving the Construction of Teaching Rules and Regulations.

Formulate and improve the documents such as "Curriculum Standards", "Quality Standards for Teaching Internship" and "Quality Standards for Teaching Graduation Thesis", and conscientiously implement the process management of preparation, teaching, approval, assistance, examination and evaluation.

4.3. Improve the Efficiency of Classroom Teaching by Building Effective Classroom

Actively promote the construction of golden class, professional thinking course, teaching mode reform demonstration class, and demonstration class of deep integration of information technology and classroom teaching. The major takes "building effective classroom" as an important means to improve teaching quality, and through a series of measures such as teaching and research activities, inspection and evaluation, summary report, and five links of classroom extension, the effective classroom will be effective and become a reliable guarantee to improve teaching quality.

4.4. Enhance the Effectiveness of Career Guidance Through the Supervision and Evaluation Mechanism

Establish the awareness of "4-in-1" supervision and evaluation and teaching quality guarantee from four aspects: target system, organization system, system system and method system. The supervision and evaluation system is evaluated by the graduation employment rate and the self-

ISSN 2706-6827 Vol. 3, Issue 13: 68-72, DOI: 10.25236/IJFS.2021.031311

employment rate of students; the feedback of the supervision and evaluation system is given by the degree of use of graduates or interns by enterprises.

5. Follow-up Survey Results and External Evaluation of Graduate Training Quality

According to the data in the past five years (2016-2020), the initial employment rate of undergraduates in this major is roughly stable at about eighty percent, and the employment direction is 25% for education industry, 9% for Energy production and supply industry, 17% for manufacturing industry, 5% for architectural industry, and 18% for others, as shown in figure 1. From the viewpoint of employment rate and employment destination, the quality of graduates cultivated by this major is relatively excellent, which is basically consistent with our training objectives.

According to the results of the follow-up survey in recent years, the employers are satisfied with the moral quality, professionalism, knowledge structure, professional skills, adaptability, communication ability, teamwork and cultural literacy of the graduates of this major. From the overall evaluation of the employers, the graduates of this major, the overall evaluation of the excellent rate reached 67%, the competent rate 30% people, the basic competent rate 3%. This shows that most of the graduates of this major have been recognized and highly evaluated by the employers.

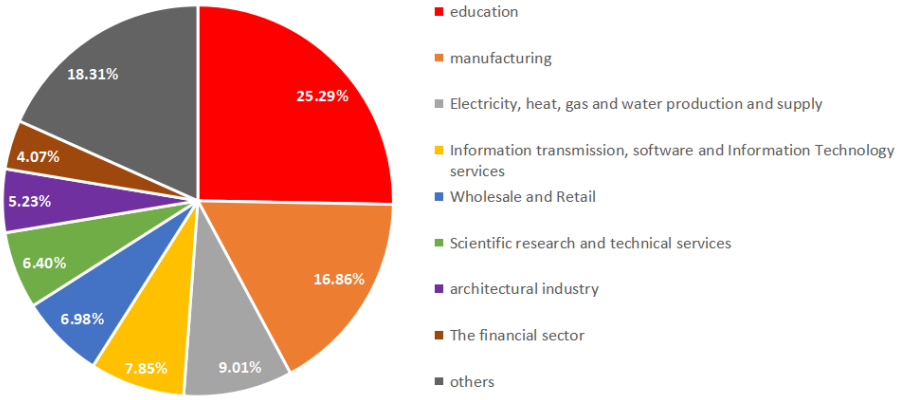

Figure 1: Employment information statistics of automation major of JLENU from 2016 to 2020

The major is the main force of VET teachers of electronics technology and application and other related majors in Northeast China and Inner Mongolia. In 2013, the first batch of 30 graduates of the experimental class of excellence in vocational education teachers, for example, five of them have served as the director of the professional teaching and research department, three as the assistant director of the teaching department, five as the main lecturer of robotics education. two are judges of the Jilin Province Youth Robotics Competition. three have guided students to win the first prize in the national skills competition for three times. 2015 graduate Pan Yuxin is currently serving as the director of Zhongying Technology Education Director of robotics curriculum, chief instructor of education robotics college career guidance, referee of national youth education robotics Olympiad, and excellent instructor of national education robotics.

6. The Main Ideas and Initiatives to Promote Professional Construction and Reform in the Next Step

6.1. Integrate Innovative Teaching Mode and Take Multiple Measures to Build a "Golden Course" of Course Thinking and Politics

Guided by the construction of "Golden Course" and "Curriculum Thinking and Politics" quality standard, we will accelerate the optimization and upgrading of automation courses, and continue to create online and offline automation courses such as automatic control principle, professional teaching method and vocational education research. We will continue to create online and offline "golden courses" of automation courses such as automatic control principles, professional pedagogy and vocational education research, and promote the extensive sharing of high-quality course resources. Organize the preparation of teaching materials for Civic and Political Science courses related to automation courses to form a synergistic effect, take "building moral character" as the fundamental task of training talents for automation majors, and build an advanced level intelligent manufacturing

ISSN 2706-6827 Vol. 3, Issue 13: 68-72, DOI: 10.25236/IJFS.2021.031311

equipment and system integration course group by innovating talent training mechanism, optimizing the curriculum system, strengthening the faculty and deepening school-enterprise cooperation.

6.2. Develop Multi-Channel Teacher Training Methods and Approaches to Build a First-Class Teacher Team

Through various forms and ways to improve the ideological quality and dedication of teachers, the need to take the teacher as the first identity, teaching as the first job, the class as the first responsibility. Through the selection of professional leaders to study in developed areas of vocational education, in-depth enterprise practice and other ways to train 2 professional leaders with professional driving ability. To train 5 professional backbone teachers by sending backbone teachers to study in developed areas of vocational education and participating in various teacher training at all levels. Through various ways such as teaching practice, production practice in enterprises and professional training, we can refine the excellent quality of " dual-teacher" teachers and train 10 outstanding " dual-teacher" teachers. We have hired 4 technical experts and teaching masters from enterprises as part-time teachers, and made the proportion of part-time teachers reach 25% through outside. We are striving to build a first-class faculty team with strong politics, exquisite business, excellent education and skillful technology, and a big heart, big vision and big pattern.

6.3. Build an Ecological Education Concept of Artificial Intelligence and Create a New Model of Artificial Intelligence + Education

With the developmental thinking of adapting to AI, applying AI, and leading AI, the university will develop a comprehensive and balanced approach in terms of professional positioning, management mode, talent training, curriculum content, faculty, and school conditions, and establish a new concept of ecological education with the unity of "growth, synergy, precision, and systemic". Explore the new education model of "ecological governance, ecological adjustment, ecological learning", give full play to the advantages of AI's big data, strong computing power, self-adaptation, self-learning and other capabilities in education and teaching activities, make AI enter the classroom and become an assistant for each educated person to learn and think, and provide theoretical support for the training of automation professionals. .

References

[1] Zhang Peng, Fang Jian, and Dong Pengzhong (2017). "Innovation and Practice of Cultivation and Training System for Excellent Vocational Education Teachers-The Case of Jilin Teachers Institute of Engineering and Technology." Vocational and Technical Education Vol.38, no.8, p.72-76.

[2] Pengzhong Dong, Limeng Dong (2018)."Research on Influencing Factors of Innovation and Entrepreneurship Education System in Application-Oriented Universities".Proceedings of the 2018 8th International Conference on Management, Education and Information (MEICI 2018).Ed. Atlantis Press, 2018,L.M. Borges, F.J. Velez and A.S. Lebres (2014). Survey on the characterization and classification of wireless sensor network applications. Communications Surveys & Tutorials IEEE, vol.16, no.4, p.1860-1890.

[3] Long Chen, Pengzhong Dong (2018)."Design of Innovation and Entrepreneurship Education system in Application-oriented Universities".Proceedings of the 2018 8th International Conference on Management, Education and Information (MEICI 2018).Ed. Atlantis Press, 2018,G. Tuna, V.C. Gungor and K. Gulez (2014). An autonomous wireless sensor network deployment system using moving robots for human existence detection in case of disasters. Ad Hoc Networks, vol.13, no.1, p.54-68.

[4] Guohong Zhen, Jian Fang (2021). "Research and Practice on Implementing Reconstructing Applied Talents Training System under the background of Overall Transformation in Local Colleges and Universities-A Case Study of Jilin Engineering Normal University" .Vocational and Technical Education Vol.42, no.2, p.19-23.

[5] Fang Jian, Zhen Guohong, and Shao Fang (2018). "Exploration and Practice of "Double Integration" in Talents Training Mode of Cooperative Educating in Production, Learning and Research-A Case Study of Automobile Service Engineering Specialty in Jilin Engineering Normal University ".Vocational and Technical Education Vol.39, no.2, p.35-38.

[6] Li Chen. "Virtual teaching of automation major in the era of 'Internet +'". Industry and Technology Conference Vol.17, no.2, p.119-120.