

Research on Building Electrical and Intelligent Specialty Construction from the Perspective of Supply-side Reform

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Abstract: Colleges and universities should continuously guide the healthy development of higher education through supply-side reforms, and strive to solve the problems in the process of structural adjustment of higher education in personnel training, improvement of supply quality, and innovation and entrepreneurship education. From the perspective of supply, this paper mainly studies the reform of talent training mode for building electrical and intelligent specialty. Based on the theory of supply-side reform, it redesigns the undergraduate talent training scheme, highlights the ability to solve complex engineering problems, constructs an "integrated, multi-level, open" operation mode, strengthens the concept of continuous improvement, establishes a closed-loop quantitative evaluation and continuous improvement system, and discusses the training connotation of applied talents from the perspective of humanistic education, so as to realize the innovation, high-efficiency and accurate supply of higher education and train more high-quality talents to meet China's economic transformation and industrial upgrading.

1. Introduction

Under the background of the gradual loss of demographic dividend and the supply-side reform of the national economic system, education, especially higher education, should take the initiative to undertake the arduous task of providing talents for China's economic development[1]. However, at present, the structure of talent training in higher education is out of line with social demand. There is a structural dislocation phenomenon in the labor market, such as "ten thousand people snatch a job" or "no job at all". There are a large number of talent supplies that cannot meet the market demand, resulting in many practical problems such as structural imbalance, quality decline, employment difficulties, etc. These problems inhibit the effective demand for higher education, while the downturn in effective demand intensifies the shortage of effective supply, thus presenting a contradictory form of coexistence of effective demand and insufficient effective supply. The supply-side reform of higher education starts from the supply level and takes solving this structural problem as its core task. As the supply side of talent training, colleges and universities vigorously train skilled and innovative talents to meet market demand through supply-side reform, thus effectively solving the problem of structural unemployment. [2-3]

The rapid promotion and widespread popularization of the specialty of building electricity and intelligence benefit from the interdisciplinary nature, and the different levels of regional economic and social development make the specialty have different emphasis on talent demand. It can be seen from this that the professional construction must be based on the development of regional economy, carry out reasonable planning in combination with the existing strength of the school, professional construction and talent training can be targeted to strengthen..

2. The Overall Planning of Undergraduate Professional Training Program Under the Supply Theory

The development of higher education is related to the specification of talent cultivation in our country's colleges and universities and plays an important role in national construction. It is necessary to rationally optimize the supply development strategy. The talent cultivation plan can meet the needs of social and economic development in the service area and reflect the characteristics and advantages of school running on the basis of meeting the general requirements of national specialties. The establishment of training objectives for professional talents aims to reflect the needs of graduates in their major fields of employment and their expectations for career development 3-5 years after graduation. To cultivate future scientific and technological talents who use technologies that have not yet appeared to solve problems that have not yet appeared. [4].

The major of building electricity and intelligence mainly trains applied engineering and technical personnel who can be engaged in electrical research, design, integration, manufacturing and other work in the construction industry, and have the ability to solve practical engineering problems and engage in applied research, scientific and technological development and other aspects. The key to accomplish this task is the quality of teaching. Quality is the eternal theme of higher education. Based on market demand, corresponding to the basic requirements of professional training programs, taking the perspective of international higher education development and drawing lessons from the construction experience of similar majors in universities at home and abroad, the problems existing in the current professional curriculum system and the future development trend are analyzed and studied. Based on the market demand and the graduation requirements of students, a training program with professional characteristics and meeting the requirements of the times is jointly formulated.

The establishment of training objectives is the cornerstone of talent training programs. The establishment of training objectives based on the supply relationship must be oriented to serve the development of regional economy and change the past positive design of talent training programs, that is, the design method of curriculum-oriented talent training programs starting from the construction of curriculum system. We should use OBE theory for reference and implement "reverse design"-the actual needs determine the training objectives, the training objectives determine the graduation requirements, and the graduation requirements determine the curriculum system, which are closely linked.

Among them, the industry output survey mainly includes graduate follow-up survey, demand survey for graduate employment units and industry enterprises, and survey on graduate quality. The professional connotation survey is mainly based on the national quality standards for undergraduate education, internal evaluation of schools, and evaluation of related majors in foreign schools. A variety of methods can be used, such as questionnaires, interviews and symposiums. For example, a top-down survey method can be used to conduct multi-angle teaching and research for enterprises, interview enterprise leaders, investigate personnel departments and relevant production and research departments, hold expert interviews, investigate successful cases in other universities, track and return the employment of graduates, i.e., investigate the technical application of the major, the educational background composition, talent sources, functions and relevant knowledge and skills actually required by the existing technical talents of enterprises.[5]

The goal of teaching design and implementation is the students' learning achievement. Therefore, the overall reform plan should adopt reverse design and adopt a layer-by-layer decomposition method: that is, to conduct enterprise investigation and research to investigate the specific needs of the students of this major in professional skills. At the same time, according to the graduation requirements of the goal design, relevant abilities and knowledge structures should be disassembled and reconstructed, the curriculum outline and course year content should be redesigned, and at the same time, the experience of other colleges and universities should be used for reference to cultivate students' comprehensive, practical and innovative ability to solve complex engineering problems. In the implementation of teaching, a positive student-centered teaching process is adopted, and the set training requirements are met through process learning. At the same time, improve the evaluation mechanism to ensure the continuous improvement of teaching.

The required clear teaching objectives are the starting point and destination of teaching and the basis for selecting teaching contents, teaching methods and teaching evaluation methods. Such a design process helps to write clear, observable and measurable learning objectives, which is also the cornerstone for engineering certification.

The training plan for professional talents must be comprehensive, specifying the specific requirements of the comprehensive knowledge and skills that students should possess when they graduate, such as humanistic quality, technological foundation, professional foundation, comprehensive design, team cooperation, engineering practice, comprehensive innovation, organization and management, lifelong learning and international exchange, and taking into account the different requirements of graduates such as employment, postgraduate entrance examination and going abroad, so as to enable the comprehensive quality and skills of students to develop in an all-round and long-term way. At the same time, we should establish various knowledge and skills corresponding matrices that are suitable for the training plan and graduation requirements, and lay a foundation for the optimization and reconstruction of the curriculum system.

3. Deeply Understand the Humanistic Connotation of Professional Personnel Training

Humanities refers to various cultural phenomena in human society. Humanistic quality refers to the comprehensive quality or development level a person has in humanities. Specifically, it refers to a person's internal quality formed by a combination of knowledge, behaviour, will, emotion and other factors, which is manifested in personality, accomplishment, temperament and so on. Humanistic quality is a concentrated expression of a person's spiritual values and world outlook. In common terms, that is, a person's principles and understanding of how to be a human being and how to deal with life have an important directive effect on a person's growth and development. Humanistic quality education has always been an important task of higher education. Universities are not only places to impart professional knowledge, but also places to mold human spirit and cultivate human character. Especially for science and engineering students, the edification of humanities and social sciences knowledge can focus on cultivating their social responsibility, innovative spirit and practical ability.

In the current social environment where utilitarianism and pragmatism prevail, the harmful consequences of the lack of humanistic quality education have frequently occurred. All these vicious incidents warn us that if a person has a lack of humanistic quality, distorted values and negative outlook on life, even if he has good professional skills, his influence on society will still be negative. Even more often, the stronger his professional skills, the greater the harm to society and others. Therefore, the function of universities in humanistic quality education cannot be weakened, but must be emphasized and strengthened.

Compared with the traditional research-oriented talents, the training of professional talents under the supply-side reform of higher education places more emphasis on the mastery and practice of applied knowledge. Therefore, the current common practice in the training of applied talents in colleges and universities is to meet the needs of the industry and regionalization in curriculum selection, to increase the proportion and time of practical courses in the training process, and to introduce a variety of approaches such as school-enterprise cooperation and construction of practical bases in the training methods. However, in the process of this practice, most colleges and universities have not strengthened their understanding of the importance of humanistic quality education.

Professional courses should assume the function of educating people, focus on educating people with professional skills and knowledge as the carrier, dig deeply into the ideological and political elements of professional courses, effectively implement the "curriculum thinking" and implement the educational responsibilities of professional teachers. This requires:

3.1 Change the Teacher Education Concept

Teachers should first change the educational concept of "teaching" and "educating people". Professional courses contain rich ideological and political connotations. Integrating the education of

socialist core values into curriculum teaching and learning is an important way to help and guide students to establish a correct outlook on life and promote students' all-round development. Secondly, we should set up the educational concept of "educating people by all staff, all-round education and all-process education", and integrate ideological and political education into all teaching activities and the little exchanges between teachers and students. In order to give full play to the subjective initiative of teachers, not every lesson or chapter needs ideological and political integration, but combining professional or teaching contents like telling stories to analyze the problems clearly and speak them out in their own language, which requires teachers to deeply understand the moral connotation behind the course contents.

3.2 Combined with the Characteristics of Students to Carry out Scientific Guidance

Before the implementation of the curriculum, the teaching contents and methods should be adjusted and perfected. The political or model contents are divorced from the actual life and students have no experience. We should turn indoctrination into dialogue and interactive communication, from theoretical explanation to tell a good lesson and a good story, so as to improve the timeliness of ideological and political education in the course.

3.3 Mining Ideological and Political Elements

Before class, make full preparations in combination with the characteristics of the major, understand the social hot spots that the students are concerned about, and find the agreement points between the major courses and the social reality and the dynamic thinking of the students. The students not only learn technology, but also learn the truth of being human in class. First of all, direct collision and confrontation between different ideas and different viewpoints are encouraged so that students can learn knowledge and also train their thinking ability and language expression ability. Secondly, through the comparison of "scientific spirit" and "great powers attach importance to instruments" and related technologies in related disciplines at home and abroad, students are promoted to realize cognition, attitude, emotion and behavior identification through participation and thinking, so as to stimulate students' confidence in China's road and industry development and cultivate socialist core values imperceptibly. Finally, from the perspective of professional accomplishment, students are required to develop a meticulous spirit and a serious and responsible working attitude, and to cultivate the students' cooperative spirit of autonomous learning and discussion with others.

4. Operation Mode Highlighting the Ability to Solve Complex Engineering Problems

According to the requirements of the new era for talents training in architectural electrical and intelligent specialty, the construction of an education system integrating knowledge, quality and ability is comprehensively promoted. The combination of knowledge imparting, ability training and quality improvement is emphasized. A scientific and reasonable undergraduate training plan is formulated. An innovative talents training system is constructed. Students are trained to have high social responsibility, strong career ambition and correct values. An "integrated, multi-level and open" operation mode is constructed. An innovative teaching system is gradually formed through the construction of a thick-foundation theoretical course platform, a multi-link experimental teaching platform and a hierarchical innovative practice platform. Emphasize that "we should not only study carefully, but also pay attention to labor practice", attach importance to experiment and practice teaching, clarify the irreplaceable important position of experiment teaching, laboratory and practice base construction in the engineering specialty personnel training system, emphasize the overall planning and coordination arrangement of theory teaching and practice teaching, and give full play to the advantages of characteristic specialty experiment teaching.

In the "integrated, multi-level and open" operation mode, the first stage mainly adheres to the people-oriented principle, adheres to teaching students in accordance with their aptitude and encourages independent learning, standardizes the teaching process of experiment, practice and practical training, carries out theoretical and experimental teaching based on the courses specified in

the professional training plan and syllabus, and on this basis enters the second stage of individualized practical training skills teaching, carries out comprehensive design experiments, and increases the number of comprehensive and designed experiments independently selected by students outside the planned hours, improves the laboratory opening system, and effectively improves the quality of experimental teaching. The third stage is mainly based on the actual combat training of various innovation and entrepreneurship competitions, additional lectures and seminars for professional teachers, and through multi-level and gradual cultivation of students' ability to solve complex engineering problems in their specialty. The fourth stage is the application training stage, "let students go out and invite enterprises to come in" for various kinds of enterprise practice training. through the introduction of enterprises and engineers with high connection with the school into the subject guidance and enterprise practice, the "real knife and real gun" train students' engineering practice ability, innovation spirit and engineering accomplishment, organically link in-class and out-of-class, inside-enterprise and outside-enterprise, theory and practice, science and humanities to ensure the quality and level of undergraduate teaching.

The society is developing continuously, and the talents trained by colleges and universities as talent suppliers must adapt to the changing needs of the society. In order to ensure the continuous improvement of teaching effect, further research and establishment of quantitative evaluation and continuous improvement system are needed to make it diversified, multidimensional and diversified.

5. Establish a Closed-loop Quantitative Evaluation and Continuous Improvement System

In order to realize the continuous improvement in each link of professional construction, it is necessary to establish a long-term continuous improvement mechanism and implement it for a long time. Only in this way can all teachers and enterprises clearly define their work processes and responsibilities, and can all the work of continuous improvement be implemented. At present, the intelligent major in our school has established a teaching process quality monitoring system composed of schools, colleges and departments, and has established a series of management rules and regulations at all levels to organize, direct, regulate, supervise, evaluate and feedback the whole process of teaching work, which systematically ensures the implementation and coordinated operation of the closed-loop monitoring guarantee system and effectively promotes the continuous improvement of student training. Our school has also issued a method to deal with the evaluation results of teaching quality. The evaluation results are taken as one of the important bases for teachers to evaluate and hire professional and technical positions. According to the situation, we have taken measures such as quality interviews, training and suspension of classes, forming a closed-loop feedback teaching quality assurance mechanism, continuously improving the teaching quality assurance system, and significantly improving the quality of personnel training.

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The joint participation of diversified teaching evaluation subjects, feedback from students, graduates, employers, third-party organizations, teachers, teaching supervisors and teaching management departments on the training quality of professional students is an important basis for continuous improvement of professional education. An assessment method and a guarantee system for the achievement degree of teaching objectives, which runs through the professional construction process and involves multiple forces, are constructed so that the training objectives meet the internal and external needs.

Multidimensional teaching evaluation content, tracking the whole learning process, including online evaluation, offline classroom evaluation, questionnaires, interviews, comprehensive evaluation, enhance students' sense of mission in learning, teachers' sense of responsibility, enterprise participation, promote the improvement of teaching quality and continuous improvement.

Diversified teaching evaluation methods include self-evaluation, mutual evaluation of students, teacher evaluation, group evaluation, expert evaluation and enterprise guidance teacher evaluation, which effectively combine diversified teaching evaluation methods to promote the deepening reform of teaching system, teaching content and teaching methods.

The continuous improvement mechanism should be established around the principle of "evaluation-feedback-improvement". It needs to establish a dual mechanism of internal teaching quality monitoring and external evaluation feedback to form an internal cycle and an external cycle to form a complete closed-loop system. The internal cycle starts around the evaluation of graduation requirements, including graduation requirements and index point decomposition, curriculum system, teaching requirements and teaching content improvement. The off-campus cycle revolves around the evaluation of the achievement of the training objectives, including the rationality evaluation of the training objectives and graduation requirements, and the feedback from enterprises and previous graduates.

The implementation of internal circulation depends on the school teaching quality monitoring and guarantee system. The implementation of off-campus circulation depends on the effective communication between enterprises and enterprises according to the needs of the development of the industry, and regular evaluation of the achievement of training objectives. On-campus and off-campus form an organic whole through evaluation and improvement of training objectives and graduation requirements, supporting and promoting each other. Through studying the teaching evaluation mechanism of diversified, multi-dimensional and diversified methods for this major, the evaluation of training objectives, graduation requirements, curriculum system and curriculum quality will be carried out on a regular basis, and the evaluation results will be used for continuous improvement. According to the graduates and employers, industry and enterprise experts to achieve the training objectives and recognition, combined with the development trend of professional technology, industry development and social needs, revise the professional personnel training program. Research on the methods of curriculum assessment result analysis and self-evaluation of fresh graduates to evaluate graduation requirements, and revise graduation requirements and curriculum system according to the evaluation results. This paper studies the analysis method of the evaluation of the achievement of the curriculum objectives. The evaluation focuses on the support of the curriculum assessment content to the curriculum objectives and graduation requirements indicators, finds out the deficiencies of students' knowledge and ability, and gives specific measures for improvement in view of the existing problems.[6]

6. Conclusion

The supply-side reform of higher education is of great significance to the further implementation of the innovation-driven development strategy, the creation of new talent dividends, the acceleration of the transformation of economic mode, the adjustment of industrial structure, the promotion of product upgrading, the promotion of economic development, and the supply-side reform. Through the reform of the design process of the professional talent training program, the connotation of talent training is deeply explored to make it more accurate to meet the market demand. On this basis, the reform of teaching mode and evaluation mechanism is carried out, and positive suggestions are put forward to improve the talent supply in the economic environment.

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