

Concept of High-Quality Talent Training Teaching Practice Project Based on DMADV

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Abstract: This paper uses DMADV and inquiry-based teaching methods to explore the teaching practice mode of high-quality talent training, and establishes a demand-oriented and customized teaching practice project model for cultivating high-quality talents. By analyzing the new requirements of industrial upgrading and economic progress for quality management and engineering management talents, precise training goals, professional design course teaching, and teaching practice projects closely linked to practical ability requirements, high-quality management talents with “solid theoretical knowledge, strong practical ability and professional practical experience” are designed.

Keywords: high-quality development; teaching reform; talent training; teaching practice; DMADV

1 Background

The 21st century is a “century of quality”, and the world will change from attaching importance to “quantity” to attaching importance to “quality”. The transformation of China’s manufacturing to China’s creation, China’s speed to China’s quality, and China’s products to China’s brands. China’s economy has shifted from a stage of high-speed growth to a stage of high-quality development. On September 12, 2017, China’s first programmatic document on quality work issued in the name of the Party Central Committee and the State Council, the “Guiding Opinions of the Central Committee of the Communist Party of China and the State Council on Carrying out Quality Improvement Actions”, was released, proposing that by 2020, the quality of China’s supply will be significantly improved and the supply system will be more efficient. In recent years, China has vigorously implemented the strategy of strengthening the country by quality, and comprehensively promoted quality reform in all walks of life. With the help of total quality management, the road of quality innovation of various domestic organizations has become wider and wider, the improvement of quality and efficiency has achieved decisive results, the quality of relevant personnel has been greatly improved, the construction of quality culture has made breakthroughs, and high-quality leapfrog development has taken solid steps, writing the “Chinese miracle” in the history of world quality management. Remarkable results have been achieved in building a quality-strong country, and the overall level of quality has been significantly improved. China’s economy has shifted from a stage of high-speed growth to a stage of high-quality development. In 2012, the State Council promulgated the “Quality Development Outline”, which clearly proposed to strengthen the construction of quality education disciplines, encourage qualified colleges and universities to set up quality management related majors, and cultivate quality professionals.

The undergraduate program of quality management engineering (master’s degree in engineering management) is an emerging popular major under the current new normal of China’s economy, and it is an interdisciplinary and cutting-edge application-oriented major. At the same time, China’s higher education is gradually promoting the development of connotation, advocating “comprehensively deepening educational reform and focusing on improving the quality of education”, “promoting student-centered heuristic, cooperative, participatory and seminar-based learning, strengthening personalized training, and improving teaching evaluation mechanisms and student assessment mechanisms”. The training of master’s degree students in engineering management and the training of undergraduate professionals in quality management engineering urgently need a new teaching practice training model.

2 Status and Problems

Under the current general trend of high-quality development, the contradiction between the shortage of quality professionals and the difficulty of student employment coexist. There is a big gap between the theoretical structure and competency framework of the ability of quality professionals cultivated by colleges and universities and the needs of enterprises. The supply of high-quality talents in China is far below the demand, professional master’s and undergraduate students lack practical experience in enterprise society, engineering management and quality theory teaching students are difficult to accept, and the practical ability is far lower than the recruitment needs of enterprises. At the same time, at present, the education practice time of master’s degree in engineering management and quality management engineering is short, the teachers are weak, the teaching practice experience is insufficient, the methods and methods of talent training are still being explored and explored, and the course content is still mainly in the educational category of theoretical research knowledge, and the teaching practice of practical awareness and practical skills education is extremely lacking.

The training of quality management talents must be accurately positioned according to the practical needs of enterprises, connect the practical ability requirements of economic development for talents with the reform of higher education, combine the classroom teaching practice of professional master’s and undergraduate students with the characteristics of quality management professional talent training, and solve the problems of disconnection between quality talent training, difficulties in promoting classroom teaching, and fragmentation of curriculum plans and teaching

organization models. To this end, it is necessary to explore the teaching practice mode of high-quality development talent training, analyze the new requirements of industrial upgrading and economic progress on the ability of quality talents, accurately train goals, professionally design course teaching, and closely link with practical ability requirements, so as to improve the employment quality of students and provide the country with “thick foundation, wide caliber, strong ability, and high quality” quality professionals with characteristics.

3 Research Methods

3.1 DMADV method

DMADV is one of the main methods of Six Sigma design, “quality is by design”, and desire alone does not lead to a better “design” process or a better process for the delivery of new products and services. As a management method, Six Sigma management is not only suitable for production and service enterprises, but also suitable for public institutions, institutions and organizations. The application of Six Sigma design is not only limited to the reengineering of existing business processes, but also widely used in the design of new product or service processes, which is the highest level of Six Sigma management strategy implementation.

This paper believes that high-quality talents are also designed, and the DMADV method is used to design classroom teaching practices to cultivate high-quality talents, better achieve teaching training goals, improve students’ abilities, and provide talents for high-quality development.

3.2 Inquiry-based pedagogy

Inquiry-based teaching method proposed by Dewey, also known as discovery method and research method, refers to the method of learning concepts and principles, teachers put forward examples and problems, so that students can independently explore through reading, observation, experimentation, thinking, discussion, etc., and discover and master the corresponding principles and conclusions on their own. Inquiry-based teaching has the characteristics of research, innovation, practice and openness, and has been praised through the exploration and construction of modern universities in the process of cultivating innovative talents.

The theoretical development of quality management is characterized by the theoretical development of quality management from enterprise practice to scientific research theoretical research, and similarly, the classroom teaching practice design to cultivate high-quality talents should also come from enterprise practice, to classroom teaching, and then to enterprise practice. For example, the quality inspection and inspection course is a compulsory course for quality management engineering majors, and it is aimed at fourth-year quality management engineering students. Students have previously taken prerequisite quality management courses. However, quality inspection and testing courses are very related to the industry background, professional knowledge, laboratory facilities, etc. of the test object, and are very new to undergraduate students without industry background and professional experience, and it is difficult to accept; At the same time, the inspection and testing standards, procedures and methods of different industries such as mechanical manufacturing, electronic information and services are different, and fourth-grade students have a tendency to work in the industry and have different knowledge needs for different industries. Therefore, teachers need to adjust their teaching requirements according to the actual situation of students and carry out new teaching practice attempts. Under the premise of mastering the professional foundation of students, teachers respect the psychology of students with different needs and fully mobilize students’ initiative. In the process of inquiry-based teaching practice throughout the course, the course content is customized to cultivate students’ independent learning ability, so that they can actively familiarize themselves with the testing and inspection environment of related industries, participate in every link of classroom learning with problems, cooperate with classmates and teachers, actively explore the relevant content of teaching, and collaborate on the process of completing assignments. The purpose of inquiry-based teaching practice is to stimulate students’ enthusiasm for learning, successfully complete teaching objectives, and successfully complete the connection between classroom teaching and employ-ability.

4 High-quality talent training teaching practice project model based on DMADV

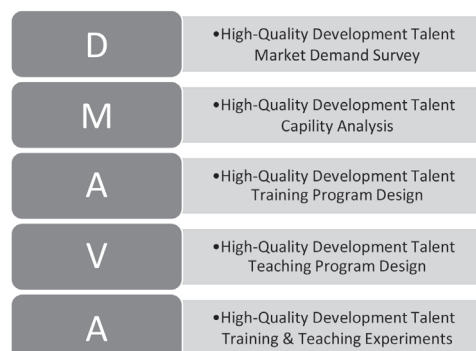


Figure 1 High-quality talent training teaching practice project model based on DMADV

4.1 Definition stage (D): Survey on the market demand for high-quality development talents

Definition is the first step in Six Sigma designing DMADV. This phase involves analyzing the project background, clarifying project objectives, identifying project team members, and so on. For Six Sigma instructional improvement projects, this phase is most important to translate customer requirements (or VOCs of customer voice) into key quality characteristics (CTQs) of the instructional output process. The most important of these is the identification of customers: who are the customers of the teaching activities?

As an educational institution, the society has a relatively common understanding of university education: “manufacturer” is the school, “product” is the student, and “customer” is the society. As a “manufacturer”, schools should deliver high-quality “product” students to the “customer” society. In this paper, teachers and students are both “manufacturers” in teaching activities, and teachers’ “teaching” and students’ “learning” are inseparable participants in the production and manufacturing process. Society and students’ parents (even schools) are “customers”; “Product” refers to students’ ability to master and apply their professional knowledge. The quality of “product” is measured by students’ mastery of professional knowledge and ability. In other words, the joint “production teaching activities” of “manufacturers teachers and students” enable students to obtain “products professional knowledge and the ability to solve practical problems”, thus serving the society and giving back “customers society”. By clarifying the basic problems and definitions of “education and teaching” activities, students can define their own position and “responsibilities” in the teaching process and better complete their learning tasks.

Investigate the current high-quality development and transformation in the new era and the trend of information age and big data technology, enterprises have the ability needs for high-quality development of quality management talents, conduct research from the perspective of knowledge, ability and quality, analyze the teaching objectives and teaching content required by current quality management engineering talents, and find out the positioning of quality management engineering talent ability training.

4.2 Measurement stage (M): Analysis of the ability that high-quality development talents should have

Mainly to integrate and decompose the talent market and student information; In the analysis stage, the information of enterprises and students is further subdivided, and they are transformed into the competencies necessary for high-quality development talents and the functions that the teaching and training process must have.

Capture the new changes in the demand for talents in the development of industrial innovation. In terms of industry, it focuses on the capital’s advantageous industries, such as: Internet, high-end equipment manufacturing, scientific and technological innovation industries, etc. The new changes need to conform to the current trend of information age and big data technology, and analyze the theories and technologies related to information and big data required by current quality management engineering talents. Determine the evaluation indicators of high-quality development talent ability, and establish a high-quality development talent ability evaluation system. According to the ability needs of enterprises for high-quality development of quality management talents, from the perspective of knowledge, ability and quality, establish a high-quality development talent ability evaluation system, and formulate teaching training goals.

4.3 Analysis stage (A): design of talent training program for high-quality development

Through analysis and research, we design a high-level training plan for high-quality talent training, and select the optimal training plan by evaluating the design ability.

Explore the classroom teaching practice mode of “practice runs through and theory is the guideline” for high-quality development of talents. On the basis of clarifying the precise positioning and goals of talent training, the continuous optimization strategy of the training program is studied, the relatively stable teaching mode and teaching content are determined, and the parts that can be flexibly adjusted are designed to adapt to the new talent training ability requirements.

Combined with the actual work requirements and production service scenarios of enterprises, according to the existing employment industry choices of fourth-grade students, according to the needs of different industries, explore the introduction of quality management practice into classroom teaching, under the program of theoretical knowledge, throughout the whole process of classroom teaching, forming a classroom teaching practice mode of “practice throughout, theory as the guideline”.

4.4 Design stage (D): Design of teaching program for high-quality development of talents

According to the ability that high-quality development talents must have and the functions that the teaching training process must have, the teaching plan is designed, including predictability design, producibility design, reliability design, etc., and a better implementation plan is obtained.

When designing teaching methods, combined with the characteristics of quality management engineering, fully considering the teaching tasks and content, teachers can mainly use classroom content teaching methods, guidance methods, demonstration methods, etc. to achieve knowledge transmission and guide students to find problems; Students can apply self-study methods, discussion methods, experimental methods, etc.

The teaching practice of the course is divided into three parts: teacher-led course theory teaching stage, student-led exploration

preference industry-related knowledge stage, and industry quality management improvement practice and achievement reporting stage emphasizing teacher-student interaction. The flipped classroom method can be used in teaching after the theoretical teaching stage. Teachers always maintain interaction with students, promote student interaction, achieve cognitive communication and common improvement, so that teaching subjects can obtain a better learning experience, so as to jointly complete the in-depth exploration of learning content and promote the internalization and application of curriculum knowledge.

The flipped classroom method can be used in teaching after the theoretical teaching stage. Teachers take quality inspection and inspection knowledge as the guiding direction, designate online teaching famous teachers open course videos, reference videos (about sampling design, quality improvement, typical cases of advanced quality enterprises, etc.), recommend reference textbooks and industry reports and other literature, so that students can “learn first” the content of quality inspection and testing, and then teach, interact and explore problems in a targeted manner in the process of students completing coursework tasks, so as to achieve “post-teaching” of supplementary content; At the same time, it pays attention to the cooperation between students and teachers and students, explores answers to questions, organizes data sharing, and completes learning goals. Teachers always maintain interaction with students, promote student interaction, achieve cognitive communication and common improvement, so that teaching subjects can obtain a better learning experience, so as to jointly complete the in-depth exploration of learning content and promote the internalization and application of curriculum knowledge.

4.5 Verification stage (V): high-quality development talent training teaching experiment

Verify the design of teaching programs for high-quality development talents and collect data for further improvement and optimization. According to the teaching design plan, carry out teaching practice for a new round of students, and evaluate students’ abilities against the evaluation indicators of high-quality development talents. Test the effect of teaching experiments, analyze the design results, find problems that need further improvement, and optimize the scheme design.

5 Suggestion

The high-quality talent training teaching practice project based on DMADV can establish demand-oriented and customized training of high-quality talents. This model can promote the development of university design disciplines, improve professional training programs, and have practical significance for high-quality development of talent training.

5.1 Establish the goal of cultivating practical ability to cultivate high-quality development talents

Closely meet the needs of high-quality economic and social development for the training of quality professionals, formulate forward-looking and social benefits training goals, and regularly evaluate and revise the training goals, so as to form specific evaluation indicators that are measurable and easy to evaluate with the extensive participation of social employers. At the same time, combined with the economic development of the region, the industrial characteristics and the advantages of the disciplines of the university, the professional positioning of quality management engineering with information characteristics is established, the information characteristics of the university are integrated, and a clear construction plan and supporting resource support system are formed.

5.2 Establish classroom teaching design of professional courses with outstanding characteristics

Meet the practical characteristics of industrial engineering management majors such as quality management engineering. Taking the “four new” economic development needs of “new technology, new format, new model and new industry” as the starting point of quality management engineering professional reform and characteristic construction, focusing on the combination of quality management engineering professional characteristics construction and local advantageous industries, the classroom teaching design of professional courses with outstanding characteristic advantages is established. Meet the knowledge learning foundation of professional courses, strengthen the design of teaching practice, and enrich the practical teaching content. Fully reflect the characteristics of quality management engineering professional industry teaching integration, infiltrate high-end manufacturing, Internet, electronic information, intelligent manufacturing, financial services, high-end services and other industry-related quality management knowledge into the quality management engineering professional classroom, integrate and expand the content related to professional knowledge, dock the teaching process with the production process, deepen students’ understanding of the correlation between quality professional disciplines and job work, and cultivate students’ ability to think about problems and professional skills and practical ability.

5.3 Build a practical teaching base and platform to support professional development

The training of master’s degree students in engineering management and undergraduate students in quality management engineering depends on good practical teaching, and requires sufficient practical teaching equipment, practice bases and practical education service platforms to meet the needs of modern quality management engineering teaching. This project integrates social resources and establishes a public platform for the experimental practice of quality management engineering with enterprises and universities as the main body. The platform also has the function of publishing internship demand information, using the platform as a medium to provide services for relevant universities to build internship bases in related enterprises. Through the construction of the platform, enterprises provide funds and

equipment support for universities that need experimental teaching and internship practical activities.

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