

Training Mode of Innovative Talents in Higher Vocational Colleges: Integration, Practice and Iteration

Yuanyuan Lu

College of Vocational Education, Tianjin University of Technology and Education, Tianjin, China

Abstract

As an important base for training high-quality and skilled talents, higher vocational colleges shoulder the heavy responsibility of cultivating talents with innovative ability. Although the research on the cultivation of innovative talents in higher vocational colleges has made some achievements, there are still the following problems: First, the existing research on the theoretical basis of the cultivation of innovative talents is insufficient, resulting in the lack of scientific training mode; Secondly, the construction of interdisciplinary curriculum system is not perfect, which is difficult to meet the diversified and personalized learning needs of students. Thirdly, the cooperative education mechanism of production, university and research is not perfect, and the practical teaching link needs to be strengthened; Finally, the continuous improvement mechanism of talent training mode has not yet formed, and there is a lack of effective feedback and evaluation system. This paper aims to provide an integrated, practical and iterative talent training model in order to improve students' innovative ability and cultivate innovative talents to meet the needs of social development.

Keywords

Innovative Talents; Talent Cultivation; Cultivation Mode.

1. Introduction

Currently, the key to national competition globally lies in talent. Talent resources are the core strength of a country and the source of driving the country forward through innovation. Innovative talents are regarded as the most critical, precious, and scarce strategic resources of our era. Therefore, cultivating innovative talents is the core strategy of building a human resources powerhouse in China and a key measure to enhance our international competitive advantage. China is currently undergoing a transition from a science and technology powerhouse to a human resources superpower. On one hand, China's educational and scientific and technological undertakings are thriving, making China a country of educational, scientific and technological excellence; on the other hand, China lacks sufficient talents in innovation and lacks talents with innovative spirit and creative ability. Cultivating innovative talents is an urgent issue that higher education needs to address, especially vocational higher education that is most closely connected with social and economic development. The shortage of innovative talents has led us to reflect: Does the current talent cultivation model need to be improved?

2. The Theoretical Basis for The Construction of Innovative Talent Training Mode in Higher Vocational Colleges

Innovative talents are the product of the combination of theoretical knowledge and practical skills, and relevant theories should be built around this core. First of all, we should adhere to the principle of people-oriented, pay attention to the individual differences of students, and fully mobilize the subjective initiative and creativity of students. Secondly, it draws on the

international advanced educational concepts, such as the "dual system" education in Germany and the "project-based learning" in the United States, emphasizing the deep integration of theory and practice. Thirdly, combining with the actual situation of our country, we will explore an educational mode that conforms to the national conditions, integrate socialist core values into the whole process of talent training, and strengthen professional ethics education. In addition, attention is paid to the improvement of students' comprehensive quality, and interdisciplinary courses are offered to broaden their horizons of knowledge and stimulate innovative thinking. On this basis, the establishment and improvement of industry-university-research collaborative education mechanism, through cooperation with enterprises, build a practice platform, enhance students' practical ability and the ability to solve complex problems. At the same time, the training mode of dynamic adjustment is constructed to achieve continuous optimization and iterative upgrading of talent training through continuous feedback and evaluation. In this way, we can effectively cope with the rapid development of science and technology and industrial changes, and cultivate more outstanding talents with innovative spirit and practical ability.

2.1. Innovative talent training related theories

The theory of training innovative talents involves many aspects, including psychology, pedagogy and other fields. Among them, the most important is the theory of constructivism.

The theory of constructivism originated from Piaget, a famous Swiss psychologist in the field of cognitive theory development. Subsequently, through the in-depth exploration and expansion of scholars such as Kohlberg, Sternberg, Katz and Vygotsky, the theory has been continuously deepened and improved, providing a solid theoretical basis for the innovation of teaching mode. Constructivism emphasizes that "knowledge is not an absolute representation of the real world, nor is it a rigid rule that applies to all situations." Students do not enter the classroom with an empty head, having already established their own views and understandings of the phenomena around them in previous studies and life, and possess the intellectual ability to reason with existing knowledge and experience. Therefore, learning is not only a simple transfer of knowledge from the outside to the inside, but also a process in which students actively participate and build their personal knowledge system and experience. In this process, students use the existing knowledge base to blend with past experience, in order to enrich and reshape their knowledge world.

In view of the above theories, constructivism teaching mode emphasizes the teaching concept of "student-oriented, teacher-oriented". Take students' independent inquiry learning as the main way of students' learning. The teaching process of the teaching model is set from five links. Clear teaching objectives, set situations, independent learning, teaching effect evaluation, strengthening summary.

At present, some higher vocational college students have insufficient learning motivation, lack of clear learning goals and lack of interest in knowledge acquisition. Constructivism emphasizes that learning is an active process. However, most students tend to traditional conclusive knowledge and lack the ability to deeply understand and apply knowledge points, so they are unable to connect their original knowledge with the actual situation, or analyze and solve problems in the new situation. [1]All these problems will affect the cultivation of students' innovative ability.

Based on the teaching mode of constructivism, teachers can complete the cultivation of students' knowledge construction, practical ability and innovative ability. Because the constructivism theory makes the teaching activity focus on theoretical knowledge to focus on practical ability; From the "teacher-student" mode of one-way knowledge transfer to the interaction between teachers and students, students and other individuals, sharing diverse resources; Teachers create real situations in the curriculum to help students understand

knowledge from multiple dimensions and angles, enhance students' sense of experience, and stimulate students' curiosity. Students are encouraged to transform from passive receivers of knowledge to active explorers. At the same time, the traditional teacher-student relationship has also changed. Teachers are no longer the "authority" of knowledge but the role of "guide", giving students more space to imagine and create, and thus cultivating students' critical ability and innovative thinking.

2.2. The role orientation of higher vocational colleges in the cultivation of innovative talents

Vocational college education has the characteristics of professionalism, application and practice, aiming at training high-quality, skilled and innovative talents to meet the needs of social development. However, with the rapid development of China's economy and society, the demand for innovative talents is increasingly strong. How to find the right role orientation in the training of innovative talents in higher vocational colleges has become an important subject of educational reform in the new era. From the following aspects, this paper discusses the role positioning of higher vocational colleges in the training of innovative talents, in order to provide new ideas for the development of vocational education in China.

First of all, break through the traditional education concept, strengthen the cultivation of innovative ability. In the training of innovative talents in higher vocational colleges, we must first break through the shackles of traditional educational concepts and bring the cultivation of innovative ability into the core of talent training. This requires higher vocational colleges to reform the curriculum, teaching content, teaching methods and so on, and pay attention to cultivating students' innovative thinking, practical ability and teamwork spirit. At the same time, strengthen cooperation with enterprises and industries, introduce practical engineering projects, so that students can continuously improve their innovation ability in the process of solving practical problems.

Secondly, focus on professional skills to create a special talent training model. In the training of innovative talents, higher vocational colleges should give full play to their own professional advantages and create a special talent training model. On the one hand, guided by market demand, we should optimize the professional structure, strengthen practical teaching and improve students' professional skills. On the other hand, focus on the cultivation of students' comprehensive qualities, such as humanistic literacy, professional ethics, social responsibility, etc., so that students have a wider range of innovation ability on the basis of professional skills. In addition, to stimulate the vitality of teachers, improve the quality of education and teaching. Teachers play a key role in cultivating innovative talents. Higher vocational colleges should stimulate the vitality of teachers and improve the quality of education and teaching. First, strengthen the construction of teachers, introduce and train a group of teachers with innovative spirit and practical ability; Second, encourage teachers to participate in enterprise projects to improve their practical ability and teaching level; The third is to establish an incentive mechanism to encourage teachers to carry out innovative teaching research and practice activities to provide strong support for cultivating innovative talents.

Finally, vocational colleges need to strengthen the integration of production and education in the cultivation of innovative talents. Integration of production and education is the basic feature of vocational education in China and has become a major personnel training mode of higher vocational education. Through close cooperation with enterprises, higher vocational colleges can combine theoretical knowledge with actual production to cultivate students' practical ability and innovative ability. At the same time, we should actively build a platform for industry-university-research cooperation to provide students with practical opportunities for innovation and entrepreneurship. Through cooperation with enterprises and research institutes, resources are shared and advantages are complementary, and students are trained

to have practical innovation and entrepreneurship ability. At the same time, we will strengthen innovation and entrepreneurship education, set up relevant courses, and hold various competitions to stimulate students' enthusiasm for innovation and entrepreneurship.

To sum up, the role positioning of higher vocational colleges in the cultivation of innovative talents is multi-faceted, including undertaking strategic tasks, constructing and improving the education system, strengthening the integration of production and education, paying attention to the construction of teachers and curriculum system. These measures together constitute the important role and mission of higher vocational colleges in the cultivation of innovative talents.

2.3. The construction idea of innovative talent training mode

(1) Integration: cross-disciplinary integration

In today's society, science and technology progress rapidly, the knowledge system of a single discipline can no longer meet the needs of solving complex problems. Therefore, interdisciplinary integration has become an important way to cultivate innovative talents. Integration is not only reflected in the curriculum, teaching methods and other aspects of integration. Through the integration of multiple disciplines, students are trained to have a broad vision of knowledge, a flexible way of thinking and the ability to solve problems cooperatively. By improving teaching methods and means, students are guided to explore on their own and cultivate innovative thinking.

(2) Practice: Practical application oriented

Practice stage is the key link to cultivate students' practical ability and innovative ability. Higher vocational colleges should establish and improve the practical teaching system, including the on-campus practical teaching and off-campus practical teaching, the implementation of industry-university-research cooperation education, the combination of theoretical knowledge and practical teaching, the combination of on-campus and off-campus. Improve students' innovative consciousness and ability, and expand the "double-qualified" teachers. At the same time, strengthen innovation and entrepreneurship education, encourage students to participate in various competitions and practical activities, improve students' practical operation ability and innovation awareness.

(3) Iteration: Continuous optimization and update

Innovative talent training mode needs to have the ability of self-renewal and continuous optimization. The iterative process includes the continuous adjustment and improvement of training objectives, curriculum system, teaching methods, practice links and so on. Through regular evaluation, feedback and improvement, the training model is always kept up with The Times, and high-quality educational resources and services are provided to students. On this basis, the construction of innovative high-skill personnel training mode aims to train high-quality talents with innovative ability, practical ability and adaptive ability, and contribute to the social development of our country.

In general, interdisciplinary knowledge integration is the basis of cultivating innovative talents, which helps broaden students' horizons and improve their problem-solving ability. Practice teaching is the key link to cultivate innovative talents. Through the combination of production, learning and research, students can enhance their practical operation ability and innovation ability. Finally, the iterative optimization training mode is an important means to achieve continuous improvement and improve the training quality, which is helpful to meet the needs of social development and cultivate more competitive innovative talents. On this basis, the integration, practice and iteration training mode will help to improve the quality and level of training innovative talents in higher vocational colleges. The training mode of innovative talents in higher vocational colleges: integration, practice and iteration is shown in the figure.

3. Integration: Integration Strategy of Innovative Talent Training Mode in Higher Vocational Colleges

3.1. The design concept of interdisciplinary curriculum system

In the training mode of innovative talents in higher vocational colleges, the construction of interdisciplinary curriculum system is the key link. It emphasizes breaking through the boundaries of traditional disciplines, taking practical problems as the orientation, and cultivating talents with a wide knowledge background, innovative thinking and problem-solving ability.

The so-called interdisciplinary curriculum is to choose a practical problem or subject topic that is valuable to the student and turn it into a topic of in-depth study. Students need to integrate theories, knowledge and skills from two or more disciplines to carry out continuous in-depth research on topics, through which they are able to concretize abstract concepts and create tangible learning outcomes. The subject knowledge will be deeply integrated into students' life experience, social life and other real situations. It builds complex and diversified connections across different disciplines, focusing on the discussion and solution of complex problems. Guided independent learning and independent thinking aims to cultivate students' interdisciplinary understanding and problem-solving skills. This is an indispensable course form for cultivating innovative talents in the digital age.[2]

Through the integration of knowledge in different subject areas, the boundaries between traditional disciplines are broken to provide students with a more abundant and three-dimensional knowledge system. On the one hand, we should fully explore the internal relations among various disciplines to form a curriculum system with the characteristics of higher vocational education; On the other hand, we should pay attention to the needs of industrial development, adjust the curriculum timely, and ensure that the course content is closely integrated with practical application. In addition, it is also necessary to pay attention to the hierarchy and progression of the curriculum system, so that students can constantly improve their comprehensive quality on the basis of mastering basic knowledge and skills. The interdisciplinary curriculum system aims to form a training environment for students to integrate knowledge, complement skills and innovate thinking in the learning process, so as to improve students' comprehensive quality and innovation ability.

3.2. Construction and implementation of curriculum modules

Based on the design concept of interdisciplinary curriculum system, we have built a curriculum system including basic knowledge module, professional skill module, comprehensive quality module and innovative practice module. The basic knowledge module focuses on cultivating students' solid theoretical foundation of the subject; Professional skills module emphasizes the cultivation and training of skills; The comprehensive quality module focuses on the improvement of students' humanistic quality, communication ability and teamwork. The innovative practice module focuses on cultivating students' practical operation ability, innovative thinking and problem-solving ability.

On this basis, we further optimize the curriculum system to make it more in line with the personalized development of students and the needs of The Times. For example, in the Fundamentals module, we introduce interdisciplinary thematic studies, giving students the flexibility to apply theoretical knowledge from different disciplines when exploring practical problems. It aims to train students to form a network, systematic knowledge structure, improve the depth and breadth of analysis problems; Professional skills module, in close cooperation with industry enterprises, regularly invite senior professionals to the school to teach, so that students in the learning process to follow the industry dynamics, grasp the development trend of the industry. At the same time, it added the simulation of actual combat, through case analysis,

enterprise internship and other forms, so that students can improve their professional skills in practice; The comprehensive quality module aims to improve students' comprehensive quality by holding various lectures, practical activities, and encouraging students to participate in volunteer services and associations. Special emphasis is placed on the training of leadership, teamwork, innovation and other aspects, aiming to enable students to quickly adapt to the society after graduation and become compound talents with a global vision; As an important part of the curriculum system, the innovative practice module has established a number of innovative practice bases. Under the guidance of tutors, students can participate in real scientific research projects, feel the scientific research atmosphere in advance, and exercise innovative thinking. In addition, innovation practice competitions are held regularly to encourage students to apply what they have learned to practice and stimulate their innovation potential.

4. Practice: A Practical Exploration of Training Innovative Talents in Higher Vocational Colleges

4.1. Construction of practical teaching system

In the process of constructing practical teaching system, higher vocational colleges should take the combination of production, learning and research as the core concept to strengthen students' practical ability and innovative ability. First of all, we should clarify the practical teaching objectives, combine theoretical knowledge with practical operation, and improve students' comprehensive application ability. Secondly, we should optimize the content of practical teaching, pay attention to the docking of curriculum and industrial needs, and cultivate students' ability of practical operation, problem solving and innovative thinking. In addition, strengthen the construction of practical teaching base, improve the conditions of practical teaching, and provide sufficient opportunities for students to practice.

4.2. Collaborative education of production, university and research and its realization path

Collaborative education is an education mode based on industry, school and research institution, through resource sharing, complementary advantages and win-win cooperation, to jointly train high-quality innovative talents to meet the needs of social development. This pattern has distinct characteristics of The Times and practical significance.

This kind of education mode can effectively improve the quality of personnel training, strengthen the social adaptability and employment competitiveness of talents. Influenced by traditional educational thought, vocational colleges pay too much attention to students' knowledge mastery, but neglect the cultivation of students' innovative thinking and innovative ability. Therefore, higher vocational colleges should establish close ties with enterprises and rely on the education mode of integration of production, study and research to realize the organic combination of theoretical knowledge imparting and practical operation. This can not only break through the limitations of the old teaching framework, but also increase the proportion of practical teaching in the whole curriculum system, and effectively bridge the gap between talent training and market demand. At the same time, it can also broaden the channels for introducing teachers and strengthen the "double-qualified" teachers. The cultivation of innovative talents cannot be separated from professional teaching staff. In addition to professional knowledge, full-time teachers are required to have innovative ability and broaden students' horizons. Part-time teachers are an important part of the teaching staff. In the coordinated cultivation of talents by industry, university and research institutes, colleges and universities should actively absorb outstanding talents from enterprises, public institutions and other social institutions to join the teaching team, and increase the proportion of part-time

teachers in the whole teaching staff structure. To achieve a positive interaction between education and industry.[4]

The implementation path of the cooperative education mechanism mainly includes the following aspects: First, to build a diversified cooperative body, including the government, enterprises, higher vocational colleges, research institutions, etc., to form a cooperative relationship of shared interests and shared risks; Second, build a platform for industry-university-research cooperation to realize resource sharing, information interoperability and technology transformation; The third is to establish the project of cooperative education of production, university and research, and introduce the actual project of enterprises into the teaching process to improve the practical operation ability of students; The fourth is to implement the "double tutorial system", in which school teachers and enterprise tutors jointly guide students to improve the comprehensive quality of students.

5. Iteration: The Iterative Optimization of Innovative Talent Training Mode in Higher Vocational Colleges

The word "iteration" originates from the concept of "iterative computation" in the field of mathematics, which means to explore a series of approximate answers from an initial estimate, so as to determine the existence interval of the solution of the problem, and finally achieve the solution of the problem. This is a cyclical feedback action that constantly adjusts and gradually approaches the desired goal or outcome. [5] In the training mode of innovative talents in higher vocational colleges, iteration, as an important methodology, plays a role in continuous improvement and optimization of the training process. It emphasizes improving the quality of education and student ability through continuous feedback and improvement. Talent training is a systematic project, involving many links and elements, need to be iterated constantly to achieve the collaborative optimization between the elements. The links and elements do not exist in isolation, but are interrelated and influence each other. This requires us to pay attention to the synergy between various elements in the actual operation in order to achieve the best cultivation effect. In this process, teachers should play the role of guides and coordinators to help the continuous iteration of talent training.[6]

5.1. Monitoring and evaluation of the cultivation process

In order to ensure the implementation of innovative talent training model, it is very important to establish a set of perfect training process monitoring and evaluation mechanism.

First, establish a diversified and dynamic monitoring system. The system should include teaching quality monitoring, practical ability training monitoring, innovation ability training monitoring and other dimensions.

Furthermore, construct a diversified assessment body. In addition to school teachers and administrators, external forces such as enterprise experts, industry experts, and parents can also be invited to participate in the evaluation to ensure the comprehensiveness and objectivity of the evaluation. In addition, we can also learn from the international advanced vocational education evaluation concepts and methods to enhance the professionalism and authority of the evaluation. Finally, strengthen the process management and feedback mechanism. Through regular teaching seminars, evaluation feedback meetings and other activities, teachers, students, enterprises and other representatives to participate in the problems found in the monitoring and evaluation, put forward improvement measures to promote the continuous optimization of the training model.

5.2. Dynamic optimization of the culture protocol

The dynamic optimization training program is mainly reflected in the following aspects: First, according to the development trend of the industry, timely update the course content to ensure

the advanced nature of students' knowledge; The second is to strengthen practical teaching, increase practical operation links, improve students' hands-on ability; The third is to pay attention to the cultivation of students' innovation ability, add innovative practice projects, and stimulate students' innovation potential. At the same time, pay attention to personalized training. Each student has a unique interest and specialty, should fully respect the personality of students, provide a variety of courses and training paths. Through the implementation of tutorial system, small class teaching and other ways, students are taught according to their aptitude, helping them to develop their potential and become innovative talents with characteristics and competitiveness.

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