

Practical Research on the Integration of Specialty and Innovation and Entrepreneurship Based on Professional Associations

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Abstract: In recent years, the cultivation of college students' innovation ability has gradually become an inevitable requirement for the connotation construction of higher vocational colleges. However, most vocational college students have poor independent learning ability, so an effective learning carrier and a scientific and regular theory are more needed to promote the cultivation of vocational college students' innovation and entrepreneurship ability. After years of practice, science and technology professional associations in higher vocational colleges can serve as an effective carrier for students to learn, and in professional associations, it is a reasonable and feasible method to use TRIZ theory to cultivate the innovation ability of higher vocational students. Through practical research in this paper, it shows that taking professional associations as a platform and TRIZ theory as a starting point can effectively combine students' professional education with innovation and entrepreneurship education. So as to achieve the good effect of “integrating innovation and entrepreneurship education into professional education, and integrating professional education into innovation and entrepreneurship education”.

1. Introduction

In recent years, with the rapid development of science and technology, today's society has entered the era of knowledge economy driven by innovation. The national competition is actually the competition for innovative talents. If science and technology prosper, the nation will prosper, and if science and technology are strong, the country will be strong. If China wants to occupy a certain position in the international community and have a strong international competitiveness, it needs to cultivate a large number of innovative talents [1]. Colleges and universities naturally assume the responsibility of cultivating innovative talents in the future, and the current college students are bound to become the new force on the road of innovation construction in China in the future [2]. The cultivation of college students' innovation ability has gradually become an inevitable requirement for the connotation construction of higher vocational colleges. However, most vocational students have poor independent learning ability, so they need an effective learning carrier and a scientific and regular theory to promote the cultivation of vocational students' innovation and entrepreneurship ability. At the same time, whether to integrate professional knowledge into the process of college students' innovation and entrepreneurship has become the focus of the next stage. Therefore, the teaching concept of “Integration of Specialty and Innovation and Entrepreneurship” was put forward. After years of practice, science and technology professional associations in higher vocational colleges can serve as an effective carrier for students to learn. In addition, taking science and technology professional associations as a platform to cultivate students' innovation and entrepreneurship ability can better combine professional education with innovation and entrepreneurship education, which is more in line with the current development direction of innovation and entrepreneurship education. In professional associations, it is also a reasonable and

feasible method to use TRIZ theory to cultivate the professional ability and innovation ability of higher vocational students.

2. Introduction to Triz Theory

TRIZ theory, also known as the theory of invention problem solving, was put forward in 1946 by the inventor of the former Soviet Union, Genrich Achshuner, and formally founded in 1956. After decades of development and practical application, people have found that innovation has certain rules to follow in combination with TRIZ theory, and innovative thinking can be cultivated and improved through scientific methods to a certain extent [3, 4]. TRIZ is the abbreviation of “Theory of Inventive Problem Solving (TIPS)” in Russian, which is translated into English as “Theory of Inventive Problem Solving (TIPS)” [5]. The research of TRIZ theory began in 1946. The research institution led by the famous inventor Genrich Achshuner of the former Soviet Union analyzed nearly 2.5 million high-level invention patents around the world, and established the TRIZ theory system after integrating the principles and principles of multidisciplinary fields. Its purpose is to study the scientific principles and laws that human beings follow in the process of invention and creation and solving technical problems. TRIZ theory is a knowledge-based, human oriented systematic solution methodology for invention problems, and is applicable to all industries [6].

The scientificity and practicality of TRIZ theory mainly depend on its powerful scientific knowledge base tools, such as 40 innovation principles, separation principles for solving physical contradictions, 76 standard solutions, scientific and technical effect databases, etc. With its powerful knowledge base tools, researchers have their own direction in professional innovation [7]. They will not just “brainstorm”, but think and explore in a targeted way, which has achieved twice the result with half the effort.

3. Current Situation of Cultivating Innovation Ability of Higher Vocational Students

In 2010, the Ministry of Education issued the Opinions on Vigorously Promoting Innovation and Entrepreneurship Education in Colleges and Universities and Self employment of College Students. He pointed out that vigorously promoting innovation and entrepreneurship education in colleges and universities has great practical and long-term strategic significance for promoting the development of higher education, deepening the reform of education and teaching, and improving the quality of talent training. In 2015, Premier Li Keqiang proposed “mass entrepreneurship and innovation” in the government work report. In the same year, the State Council issued the Implementation Opinions on Deepening the Reform of Innovation and Entrepreneurship Education in Colleges and Universities.

In this context, higher vocational colleges cultivate higher applied professionals with necessary basic theoretical knowledge and strong practical ability. The innovation and entrepreneurship ability of higher vocational students is directly related to the innovation level in the field of applied technology. The cultivation of innovative ability of higher vocational students can be generally divided into three stages: cultivating innovative spirit, cultivating innovative ability, and cultivating innovative methods. In terms of cultivating the spirit of innovation, many scholars pointed out that it is to cultivate tenacious creative motivation, unswerving belief in success, tenacious creative will, and healthy creative emotion. In terms of cultivating innovation ability, the more famous one is the practice and exploration based on the “3T” model proposed by Professor Yan Huigeng, Dean of Changzhou Institute of Engineering Technology in 2015 [8]. The “3T” innovative education model has established the concept of “everyone can innovate, always can innovate, everywhere can innovate”. In terms of training innovation methods, many scholars pointed out that under the premise of strong innovation spirit and innovation ability, they should comprehensively use their own intellectual ability and non intellectual ability to achieve the goal of deepening understanding, improving effectiveness and successfully completing their own innovation ideas. These innovative methods are summarized as follows: implementing innovative ability education, training innovative

ability thinking, strengthening the study and application of innovative ability techniques, and cultivating the personality and quality of innovative ability [9-12].

4. Using Triz Theory to Cultivate the Ability of Professional and Innovation Integration of Students in Higher Vocational Professional Associations

After 60 years of development and practical application, TRIZ theory has been widely applied abroad, with good results. In recent years, it has been gradually learned and used by Chinese researchers, and is gradually promoted and used in China. It is found that with TRIZ theory, innovation has certain rules to follow, and innovative thinking can be cultivated and improved through scientific methods to a certain extent. Since the theory has been determined, theoretical learning must be carried out with an effective carrier. There are many learning carriers in higher vocational colleges, such as professional public elective courses, Communist Youth League organizations, etc. In this paper, the author chooses the scientific and technological professional associations in higher vocational colleges as the carrier for research and practice, and has achieved good results.

Take the Electronic Information Association, a science and technology professional association of the Electronic Information Engineering Department of Jiangyin Vocational and Technical College of China, as an example. According to the professional characteristics, the club provides each member with a “DIY experiment box”. There are multimeter, electric soldering iron, tweezers, wire stripper and other necessary instruments and tools in the test box, as well as bread board, battery box and other experimental materials. This makes students' experiments no longer depend on specially designed laboratories. They can not only practice in class, but also explore and practice in extracurricular anytime and anywhere to verify their ideas. Students participate in professional knowledge learning organized by associations and TRIZ theory training and learning at fixed time. In extracurricular time, they use the “DIY experiment box” to verify their innovative ideas at any time and anywhere, gradually forming an innovative atmosphere of innovation, daring to innovate and being able to innovate, and have achieved relatively rich innovative results. Since two years in 2017, the students of the association have completed 12 provincial college students' innovation and entrepreneurship training programs, won a number of innovation and entrepreneurship awards, including 2 provincial first prizes, 3 third prizes, 1 municipal first prize, 2 second prizes, and 5 third prizes. The students have published more than 30 academic papers, applied for 2 invention patents, and authorized 3 utility model patents.

5. Classic Case

Gu Jinheng, the president of the Electronic Information Association in 2017, is such a typical representative who wants to innovate, dares to innovate, and can innovate. He usually studies professional knowledge seriously, often uses TRIZ theory to innovate and create existing products or technologies, and produces many innovative products, one of which is “a kind of one to many, point-to-point switch using 2262 series chips”.

The 2262 series chip is a low-power and low-cost general-purpose codec circuit manufactured by CMOS technology. 2262 chip can be controlled by eight different address bits, and can be used for wireless remote control transmission circuit. During normal use, the eight address bits of the transmitter and the receiver need to correspond one by one, otherwise the receiver will not get the information of the transmitter. Gu Jinheng made use of this feature to transform the existing technology, matching all the address bits of the transmitting end and the receiving end, thus realizing the design and manufacture of a one to many point-to-point control switch. Later, with the help of the school and instructors, Gu Jinheng independently applied for and authorized the Chinese utility model patent (201720322773.0).

6. Conclusions

In recent years, the cultivation of college students' innovative ability has gradually become an inevitable requirement of the connotation construction of higher vocational colleges. However, most vocational college students have poor independent learning ability, so they need an effective learning carrier and a scientific and regular theory to promote the cultivation of vocational college students' innovation and entrepreneurship ability. After years of practice, science and technology professional associations in higher vocational colleges can serve as an effective carrier for students to learn. In professional associations, it is a reasonable and feasible method to use TRIZ theory to cultivate the innovation ability of vocational students. Taking the Electronic Information Association, a science and technology professional association of the Electronic Information Engineering Department of Jiangyin Vocational and Technical College in China, as an example, by introducing its innovative practices and achievements, as well as the relevant situation of Gu Jinheng, a typical figure, it shows that its innovation and entrepreneurship achievements have been significantly improved, and the innovation and entrepreneurship ability of students has also been significantly improved.

Through practical research in this paper, it shows that taking professional associations as a platform and TRIZ theory as a starting point can effectively combine students' professional education with innovation and entrepreneurship education. So as to achieve the good effect of "integrating innovation and entrepreneurship education into professional education, and integrating professional education into innovation and entrepreneurship education".

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