



# Training and Practice of Computer Professional Skill Competition in Vocational Colleges on Innovative Talents Under the Background of Artificial Intelligence

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**Abstract.** Innovation is an important source of national development, vocational college students as the main force of national skilled personnel, training innovative personnel is also urgent. Skill competition in vocational colleges plays a guiding, benchmarking and catalytic role in vocational education, and plays an important role in the cultivation of innovation ability in vocational colleges. Technology enabling education, technology innovation education, research on innovative talents under the background of the development of artificial intelligence technology, and realization of personalized large-scale education have become important issues to be solved urgently. The research on fostering the innovation ability of computer professional skill competition in vocational colleges can be carried out from four aspects. First, it can promote the mastery of innovation knowledge base in the industries and enterprises where the skill competition comes from. Second, the ability to find problems, retrieve information, solve problems, innovate and learn, and form an independent personality; Third, the application of logical thinking and critical thinking in skill competition to improve the consciousness of innovative thinking ability; Fourthly, the results of practical skills competition promote innovative practical operation ability.

**Keywords:** Artificial intelligence · Vocational colleges and universities · Skills competition · Innovation practice

## 1 Introduction

As an important driving force of the new generation of industrial revolution, artificial intelligence will have a significant impact on the country's economic and social development. The main performance is that the application of artificial intelligence technology will improve productivity, improve the research and development ability of new tools and technologies, explore the value of new data resources, empower thousands of industries and form new space for intelligent industry, and thus promote economic growth. Innovation in various industries will become a major trend. Through literature review, it

is found that most Chinese researchers, starting from the perspective of artificial intelligence technology, put forward the challenges of new technology and train innovative talents with new abilities and qualities, but there are few innovative studies from the needs and current situation of vocational colleges students. In April 2022, Article 32 of the newly revised Vocational Education Law of the People's Republic of China clearly stipulates that "the state shall organize and carry out vocational skills competitions and other activities to provide a platform for technical and skilled personnel to show their skills and exchange skills, and continue to train more high-quality technical and skilled personnel, skilled craftsmen and great country craftsmen." With the goal of cultivating high-quality innovative talents, and with the learning based on skill competition as the starting point, it is of great significance to advocate giving full play to the education function of skill competition, promote the complementarity of competition activities and teaching activities, and help students to build a systematic innovative knowledge system, improve innovative thinking and other abilities. Under the background of artificial intelligence and from the perspective of the current demand of vocational college students, this study explores the influence of vocational skill competition on the innovation factors of vocational college students.

## **2 Analysis of Innovative Talents in Vocational Colleges Under the Background of Artificial Intelligence**

People provide ideas and methods to solve problems, and computers greatly improve the efficiency of the industry, and change the original business model. The future direction of artificial intelligence is to greatly enhance human ability with intelligent technology, so that artificial intelligence can be a better helper of human, so that artificial intelligence can enable a new era. Under the background of artificial intelligence, all walks of life need innovative talents to adapt to social needs, improve the quality of talent training, and face the opportunities and challenges brought by artificial intelligence technology. Therefore, it is urgent for vocational colleges to add artificial intelligence elements [1]. According to the collation and induction of domestic and foreign literature on the evaluation of college students' innovation ability, on the basis of educational evaluation theory and constructivism learning theory, Meng Jun et al. built a comprehensive evaluation index system of college students' innovation ability composed of four first-level indicators and 13 s-level indicators, including innovative learning ability, innovative knowledge base, innovative thinking ability and innovative practical operation ability, from the influence of mathematical Contest in Modeling on college students' innovation ability [2]. Through the investigation of the winners, instructors and experts of innovation and entrepreneurship competitions related to vocational colleges, this paper draws on the comprehensive evaluation index system of college students' innovation ability, adopts the method of logical analysis and literature, and analyzes the innovation factors of students in vocational colleges through the advantages of the competition under the guidance of "student-oriented" thought, and studies the influencing factors of innovative talents in vocational college competitions.

## **2.1 Independent and Innovative Personality is the Basic Quality for Carrying Out Creative Activities**

Creative personality is the combination of all kinds of psychological qualities with the tendency of creative activities, which is the internal basis of innovation. The formation of creative ability is based on the cultivation of creative personality. Based on the perspectives of creativity and psychology, Chen Yalan, Zhang Xiaoming et al. studied 194 Nobel laureates in the field of physics, 375 academicians of Chinese Academy of Sciences and 291 academicians of Chinese Academy of Engineering to explore the correlation between drivers of original innovation and innovation performance. The research shows that: innovative personality has a significant impact on creative thinking, and innovative thinking has a significant impact on innovative techniques. Creative thinking plays a partial mediating role between creative personality and original innovation performance, while innovative techniques play a partial mediating role between creative thinking and original innovation performance. The policy and institutional environment positively moderates the influence of innovative personality, creative thinking and innovative techniques on the original innovation performance. Compared with Chinese academicians, Nobel laureates have advantages in creative thinking and innovative techniques [3]. Guilford points out that creativity is independence, thirst for knowledge, curiosity, imagination, observation, etc. Training students' innovation ability in vocational colleges can take the cultivation of creative personality as the goal. According to the characteristics of vocational college students, it can be carried out from the aspects of cultivating students' good psychological quality, creating a good atmosphere of study and life, respecting students' personality, using the correct evaluation mechanism and actively carrying out related educational activities.

## **2.2 Interdisciplinary Knowledge System is the Knowledge Base of Creative Talents' Thinking**

Knowledge is the key to open the door of innovation, social development and technological progress, to achieve a breakthrough, must go beyond the boundaries of their knowledge field. Interdisciplinary integration has become an important feature of the current intelligent society. With the progress of technology, more and more innovations show basic innovation and integrated development. Compound talents have become the new trend of innovative talents in the current intelligent society. Technological innovation is the essence of knowledge, and the breadth and depth of knowledge have great influence on innovation. The research shows that the more kinds of knowledge mastered, the broader the knowledge field, the greater the contribution to innovation activities. The width of knowledge base to some extent represents the scope of knowledge domain, which determines the ability to understand the external environment and absorb and integrate external knowledge, which is conducive to bringing new knowledge elements to the existing knowledge system and increasing creativity and vitality for innovation. The depth of knowledge reflects the depth of knowledge elements and industry experience in the technical field[4]. The more in-depth the master of the existing technology, the more conducive to the flexible processing and efficient use of the existing knowledge, reduce

the cost of developing new technology, find new ways of application and profit. The students in vocational colleges lack the original knowledge. The innovation of vocational college students is the exploration, practice and thinking of new knowledge on the basis of existing knowledge literacy, so as to obtain new ideas.

### **2.3 Higher-Order Thinking is a New Ability in the Thinking Field of innovative talents**

Higher-order thinking is the core of higher-order ability, which mainly refers to innovation ability, problem solving ability, decision-making ability and critical thinking ability. Advanced thinking ability embodies the new requirement of talent quality in knowledge age and is the key ability to adapt to the development of knowledge age. As the core quality of innovative talents, higher-order thinking has been paid more and more attention in the training of core literacy in various disciplines. To advocate the in-depth teaching of higher-order thinking has become the focus of current education reform and is gradually applied in the curriculum reform and practice guided by the new round of core literacy in our country. The problem with innovation is changing the world. The research of higher-order thinking not only excavates the diagnosis rule of higher-order thinking, but also forms the design scheme for training innovative talents in the industrial context. In the innovation process, students in vocational colleges need to analyze, compare and apply data, information and knowledge, so as to creatively form new ideas and methods for solving problems and form the level of wisdom development. Therefore, higher-order thinking is the new ability of human's innovative thinking in the intelligent age.

### **2.4 Practical Operation Ability is the Necessary Means to Realize Innovative Talents**

Practice is the only standard to test truth. Innovative practice can effectively realize the integration of innovative knowledge, innovative consciousness and innovative thinking, and is the final "foothold" for innovative talents to realize social value and self-value. Innovation practice is a relatively repetitive practice, which generally refers to all the creative practice that people engage in. The role of innovation practice in the cultivation of innovative talents is mainly reflected in the following aspects: First, innovation practice helps to strengthen the innovator's innovation consciousness. Innovation consciousness is the basic consciousness of innovative talents. It is the psychological motivation to drive individuals to innovate, which is the concept and consciousness of advocating innovation, pursuing innovation and taking pride in innovation. Secondly, innovation practice can greatly enrich the innovation experience of innovators. Experience is essential for any kind of work, even for people who are engaged in theoretical research. Third, innovation practice can greatly enhance the innovation motivation of innovators.

### **3 Exploring and Practicing the Innovative Thinking of Computer Students in Vocational Colleges**

The formation of knowledge is centered on curriculum learning, the formation of ability is based on practice, and the formation of independent personality is based on habit formation. Both knowledge, ability and independent personality must be established on the basis of students' education. The content and evaluation criteria of national and provincial skill competitions are basically derived from the actual production of industries and enterprises. They are summaries and refinements of the typical production process and production technology requirements, and have the characteristics of comprehensiveness, standardization, universality and foresight. The author studies the influence of skill competition on innovative talents in vocational colleges through students participating in skill competition.

#### **3.1 Skills Competition to Hone the Heart, Promote the Formation of Innovative Independent Personality**

Skills competition is based on basic professional theories and professional skills to improve individual skills and cultivate teamwork spirit. Skills competition exercises students' independent personality. In terms of cognition, students who participate in the competition have mastered comprehensive and in-depth knowledge and skills, and obviously have unique views and evaluation on innovation. In terms of emotion, after the training of high-intensity competition and high-pressure competition, the students' independent personality characteristics are more obvious, and they have strong creative enthusiasm, innovative motivation, stronger initiative and the ability to complete tasks independently. In the aspect of behavior, after long-term skill practice, the independent personality characteristics of the students participating in the competition show natural, stable and lasting psychological tendency of innovation.

#### **3.2 Skill Competition Promotes the Construction of Compound Knowledge and Forms the Knowledge Base of Innovative Talents**

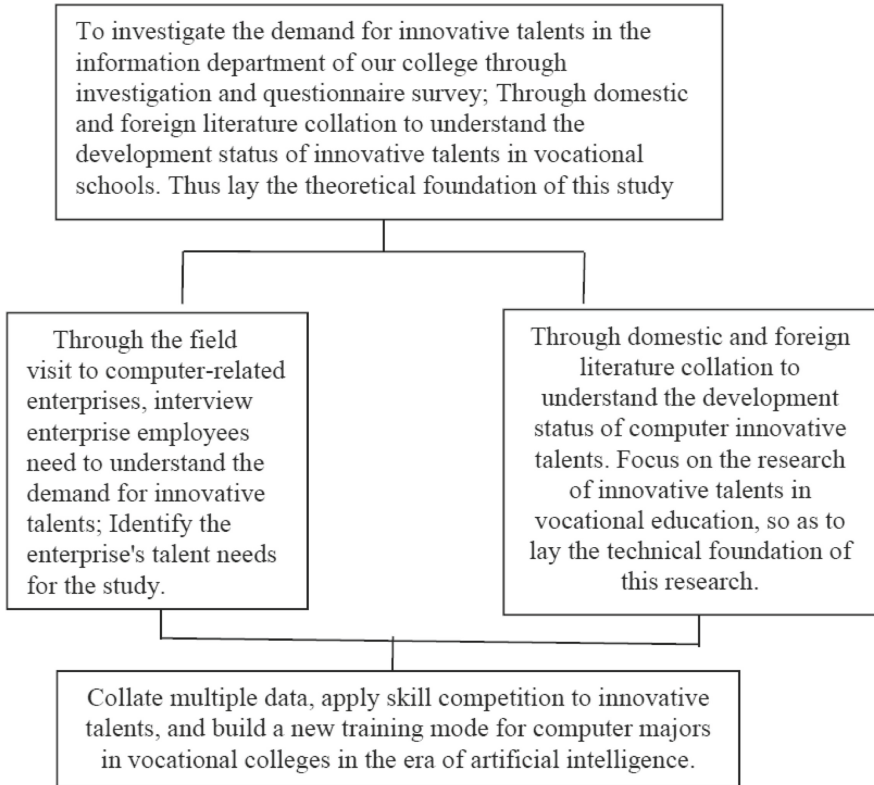
Skill competition skill point examination needs strong theoretical support. Danneels organically combines exploration and utilization with enterprise innovation activities and divides enterprise innovation activities into exploratory innovation and exploitative innovation according to the different degree of innovation and knowledge base [5]". Skills competition consists of basic knowledge level: humanities knowledge level, foreign language knowledge level, natural science knowledge level professional knowledge level: professional knowledge level, technology (common mathematical software, etc.). The competition exercises students' knowledge proficiency level, knowledge crossing level, flexible use of professional knowledge combined with knowledge of other disciplines, cross-learning and problem-solving ability. The comprehensive application of these compound knowledge forms the knowledge foundation for innovative talents.

### **3.3 Skill Competition Modeling Thinking, Training Students' Higher Order Thinking**

The research of higher order thinking under the background of artificial intelligence has entered the upsurge stage. Hu Xiaoyong et al. selected 255 SSCI and CSSCI articles in related fields and sorted out ten key research directions through content analysis and viewpoint clustering: The modeling of learners' thinking characteristics supported by big data technology, the risk prediction of higher-order thinking cultivation based on learning analysis, the promotion of higher-order thinking development by immersive learning supported by extended reality, the cultivation of higher-order thinking assisted by educational robots, and the cultivation of computational thinking and design thinking in the intelligent age, etc. [6]. The research suggestions on the cultivation of high-level thinking enabled by artificial intelligence are put forward: Researchers need to have a research perspective of interdisciplinary and super-disciplinary integration, promote the path optimization of "theory, technology and practice" in the same direction, use computer-related professional knowledge and systematic methods, transform a practical problem into an industry application problem, apply the thinking and language of industry modeling to find out the industry correlation, and solve the problem. The process of vocational college students participating in skill competition and competition modeling is also the process of cultivating their own innovation ability. Before the competition, professional teachers will set up a competition training team to train students in relevant contest modeling and other skills. In the competition, analyze the topic, build the model and complete the topic according to the division of labor of the team; After the competition, make a self-summary. In this whole process, students' thinking ability, information retrieval ability, model construction and application ability, teamwork ability and so on will be improved to a certain extent. At the same time, it will arouse students' learning enthusiasm and enhance their awareness of innovation.

### **3.4 Skills Competition Leads the School to Innovate and Practice, and Keeps Pace with the Development of Industry Skills**

Skills competition enables students to have a strong sense of innovation, generate strong motivation for innovation, mobilize and stimulate their own potential, put forward innovative goals and ideas, and generate the spiritual motivation to put them into action. Through participating in the skills competition, students can deeply realize the significance and value of innovation, thus generating a strong sense of social responsibility, forming the moral concept of contributing to the society through innovation, the enterprising spirit of pursuing ideal goals, the exploratory desire and critical spirit of finding problems, and generating a strong desire or passion for creation. It is necessary to observe or simulate innovation, but in the practice of observing or simulating innovation, it is often impossible for people to fully devote themselves to it and cannot mobilize their creative potential to the greatest extent. In the innovation practice, the competition undertakes specific innovation tasks and responsibilities, and is closely linked with their own future, interests and honor. This situation enables innovators to devote themselves to their work with a serious attitude, so as to stimulate their creative potential and carry out



**Fig. 1.** The research process is seen from the cultivation of innovative talents.

innovation practice. Skills competition synchronizes with the latest skills of the industry, enabling students to carry out professional practical innovation, better adapt to the industry and promote the development of the industry (Fig. 1).

## 4 Results and Analysis

The factors of innovation ability of 100 freshmen in Grade 20 were investigated in the form of test questions. The results are shown in the Tables 1 and 2.

More than 90% of them are students who participated in the competition. Through comparison, it can be found that students' innovation ability in all aspects has been significantly improved.

**Table 1.** Investigation on innovation ability of Grade 20 freshmen in two academic years

Number of People	Innovation ability					
	Interdisciplinary knowledge	Interdisciplinary application	Analytical thinking ability	Critical thinking ability	Big data computing thinking	Innovation and practice ability
Don't understand	89	95	98	87	95	75
Some understanding	10	4	1	10	4	23
Familiar with	1	1	1	3	1	2

**Table 2.** Investigation on innovation ability of Grade 20 freshmen in two academic years

Number of People	Innovation ability					
	Interdisciplinary knowledge	Interdisciplinary application	Analytical thinking ability	Critical thinking ability	Big data computing thinking	Innovation and practice ability
Don't understand	30	46	35	31	45	20
Some understanding	58	41	50	58	44	72
Familiar with	12	13	15	11	11	8

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