

# Research on the cultivation of college students' innovative ability by industry-teaching integration model based on personalized education

Chen Ru\*, and Qun Wang

Research direction: Software Engineering, Shandong Xiehe University, Jinan, Shandong, China

**Abstract.** In the era of vigorous development of higher education, the cultivation of college students' innovation ability has become a core issue. This paper explores the role of industry-teaching fusion mode based on personalized education in the cultivation of college students' innovative ability. The industry-teaching fusion mode based on personalized education can carefully formulate personalized cultivation programs based on students' individual differences and deeply integrate the actual needs of the industry into all aspects of education and teaching. This model can significantly enhance the innovative consciousness and practical ability of college students and promote the cultivation of innovative thinking. Students are practiced in real industrial environments such as enterprise practice and project cooperation, effectively improving their comprehensive quality. This study not only provides new ideas for the reform of higher education, but also lays a solid foundation for the cultivation of innovative talents in line with the needs of society, which has important theoretical and practical value.

## 1 Introduction

In today's era of booming economy and increasingly fierce global competition, innovation has become the core driving force for social progress and economic growth. Higher education, as an important position for cultivating high-quality talents, how to enhance the innovation ability of college students has become a key issue to be solved in the field of education. However, the traditional education model often ignores the individual needs of students, and it is difficult to stimulate the innovation potential of students. Meanwhile, the disconnection between education and industry also limits the improvement of students' practical ability and innovative thinking. In order to solve these problems, the industry-industry integration model based on personalized education has emerged, which emphasizes student-centeredness, customizes the cultivation program according to the individual differences of students, and focuses on cultivating students' innovative thinking and practical ability. At the same time, through in-depth cooperation with enterprises and industries, industrial demand is integrated into the education and

---

\* Corresponding author: [1172886050@qq.com](mailto:1172886050@qq.com)

teaching process, so that students can be practiced and grow up in a real working environment. This model can not only meet the social demand for innovative talents, but also promote the deep integration of higher education and industrial development, providing strong support for the country's economic and social development.

## **2 Current situation of the cultivation of college students' innovative ability**

Before in-depth investigation of the role of industry-teaching integration model based on personalized education on the cultivation of college students' innovation ability, it is necessary to clarify the current situation of the cultivation of college students' innovation ability, which is affected by the intertwining of social, school and students' own factors.

### **2.1 At the social level**

Although there is an urgent demand for innovative talents in the society, there still exists a tendency to emphasize academic qualifications but not ability, and to emphasize theory but not practice in the talent selection and evaluation mechanism. Enterprises tend to choose students who graduated from famous colleges and universities and have excellent professional performance when recruiting, and there is a lack of sufficient quantitative assessment system for students' innovation achievements and practical innovation ability. In addition, the innovation and practice platform provided by the society for college students is limited, and although the cooperation between industry, universities and research institutes is being promoted, the depth of synergy is insufficient. There is a disconnect between the scientific research achievements of universities and the actual needs of enterprises, and it is difficult for students to find opportunities to fully utilize their innovative talents in the society, which leads to the frustration of innovation motivation.

### **2.2 At the school level**

In terms of training mode, most colleges and universities still divide the teaching system into traditional disciplines and specialties, the curriculum is relatively solidified, and there are fewer interdisciplinary integration courses, which limits the expansion of students' innovative thinking. Teaching methods are mostly lecture-based, students passively accept knowledge, lack of active exploration and innovative practice links. The construction of innovation and practice platforms in schools is lagging behind, laboratory equipment is outdated and not updated in time, and the function of innovation and entrepreneurship bases is not perfect, which is difficult to meet the diversified innovation needs of students. At the same time, the incentive mechanism for students' innovation activities is not sound, and the weighting of innovation achievements in the evaluation of scholarships and the awarding of honors is set at a low level, which can't effectively inspire students to participate in the enthusiasm of innovation activities.

### **2.3 At the level of the students themselves**

Some students do not have a clear learning purpose, lack a deep understanding of the importance of innovation, and only focus their academic goals on completing the courses and obtaining the degree certificate, without the awareness of actively cultivating innovation ability. In terms of learning mode, they are accustomed to relying on teachers' lectures in the classroom, and their ability of independent learning and inquiry-based

learning is insufficient, making it difficult for them to discover and solve problems independently. In addition, students generally lack innovative practical experience, when facing practical problems, due to insufficient knowledge reserves and lack of practical skills, resulting in innovative thinking is difficult to be effectively transformed into actual innovation results, which further hinders the enhancement of innovation ability.

### **3 Design of industry-teaching integration model based on personalized education**

In the pursuit of educational innovation and industrial upgrading, exploring the combination of the concept of personalized education and the mode of integration of industry and education has become a key path to cultivate high-quality talents.

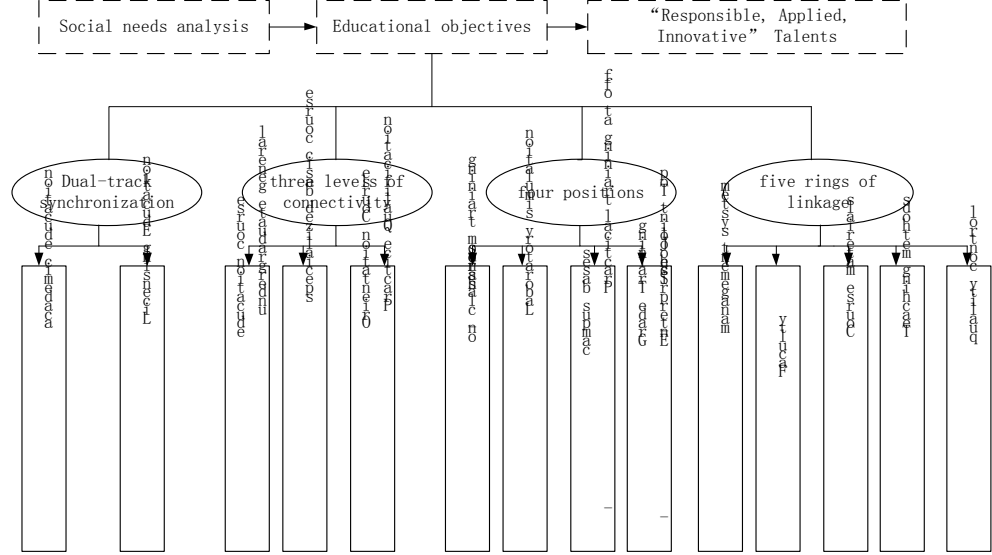
#### **3.1 Creating an industry-education community, collaborating with multiple participants, and implementing a shared construction mechanism**

Enterprises of different sizes and industry sectors are invited to participate. Large enterprises provide cutting-edge technology support and large-scale practice platforms with rich resources, while small enterprises bring diversified ideas with flexibility and innovative vigor. For example, in the field of information technology, large Internet enterprises can take the lead in building a cloud computing practice environment, while small innovative software enterprises can share emerging algorithm application cases. Enterprises and schools establish shared resource libraries, covering enterprise production cases, equipment operation manuals, teaching courseware of institutions, research reports of scientific research institutions, etc. Enterprises profit from talent delivery and application of technological innovation results, and institutions enhance their schooling conditions through enterprise donations and cooperative project funding, which is mutually beneficial for both sides to jointly deal with market risks and technological research and development risks.

#### **3.2 Dual-track synchronization, three levels of connectivity, four positions, five rings of linkage**

Dual-track synchronization lays the foundation, with academic education and practice qualification education running in parallel. On the one hand, students receive systematic school courses to build a solid professional knowledge system; on the other hand, through the practice qualification education, they come into contact with industry-recognized professional standards and norms to broaden their knowledge and vision. Three layers of deepening knowledge, undergraduate general education courses, professional foundation courses and practice qualification orientation courses. The undergraduate general knowledge course provides a wide range of knowledge and cultivates comprehensive literacy; the professional foundation course focuses on the basic knowledge of the profession; and the practicing qualification direction course focuses on the industry segments, allowing students to have an in-depth understanding of the professional content of a specific direction. The four-pronged strengthening of practice, classroom practical training, laboratory simulation operation to provide a more realistic simulation environment; off-campus base training allows students to enter the enterprise field, contact with the real business scenarios; school-enterprise joint top job training allows students to fully integrate into the workflow of the enterprise, to undertake the actual work tasks. The five-ring linkage guarantee and enhancement, management system to ensure the orderly development

of teaching and practice activities, faculty team consists of school teachers and enterprise experts, bringing both theoretical and practical guidance; curriculum materials closely follow the development of the industry and the demand for innovation, providing knowledge carriers; teaching methods using a variety of means to stimulate students to take the initiative to think; quality monitoring of the whole process of training to carry out assessment and feedback, timely adjustments and optimization, continue to enhance the quality of the training of students' innovation ability. Quality monitoring assesses and gives feedback on the whole cultivation process and makes timely adjustments and optimizations, so as to continuously improve the quality of students' innovation ability cultivation.



**Fig. 1.** Design of a model for integration of industry and education.

### 3.3 Individualized education integration

With the help of interest research, we accurately capture students' interests and find a direction for their personalized development; through aptitude tests, we comprehensively assess students' knowledge mastery and skill levels, so as to tailor teaching to the students' needs; and through career planning counseling, we plan clear career development paths for students based on the market demand and their own attributes. Based on the results of these assessments, we tailor-make personalized training programs for students, including curriculum choices, practical projects, and counseling support, to fully meet the unique development needs of each student and to explore their maximum potential.

## 4 Implementation of an industry-teaching integration model based on personalized education

All aspects of the industry-teaching integration model based on personalized education are closely linked and synergistically promoted. In the planning stage, through online and offline questionnaire surveys, students' interests and strengths in their professional fields are deeply explored, professional tools and one-on-one interviews with career planners are used to assess students' abilities and vocational inclinations, and then the personalized curriculum system, which covers diversified elective modules and encourages

interdisciplinary learning, and the practice plan, which is in line with the individual's vocational goals, are tailor-made. In the teaching implementation stage, real cases from enterprises are integrated into theoretical teaching in the classroom, and group collaboration is organized to carry out project-based learning. In terms of enterprise practice, not only are internship bases constructed and strictly managed to allow students to accumulate experience under the guidance of enterprise mentors, but actual projects from enterprises are also introduced to the campus, allowing students to participate in the whole process. In terms of support and guarantee, through regular training of teachers, the introduction of enterprise talents to create a dual-teacher team, increasing investment in the construction of laboratories and practice platforms, and the establishment of an innovation fund and incentive mechanism, the program can stimulate the innovation potential of college students in all aspects, and help them realize innovative breakthroughs in their future careers and academic paths.

## 5 Concluding remarks

Under the wave of industry-education integration, the personalized education model brings a brand-new opportunity for the cultivation of college students' innovation ability. By accurately grasping students' interests and career tendencies, carefully customizing courses and practice paths, coupled with classroom innovation, in-depth participation of enterprises and all-around support and guarantee, the innovation potential of college students has been deeply explored. This not only helps students' personal development, but also delivers a large number of innovative talents to the society, and pushes various industries towards a new stage of innovation-driven development.

2024 National “Fourteenth Five-Year Plan” Project of Commercial Education Research: Research on the Cultivation of College Students' Innovative Ability through Personalized Education in the Context of Industry-Education Integration. Project Number: SKJYKT-2405141.

## References

1. Zhong Danyan, Yan Qiuyu. Analysis on the Cultivation of Innovation and Entrepreneurship Ability of College Students under the Perspective of Personalized Education[J]. *Innovation and Entrepreneurship Theory Research and Practice*, 2022, 5(03): 123-125.
2. Zhang Mei. Research on the Cultivation of Innovation and Entrepreneurship Ability of College Students under the Perspective of Individualized Education [D]. Chang'an University, 2016.
3. Liu Xiang. Exploration of core competence cultivation mode of college students' innovation, entrepreneurship and practice under the perspective of industry-teaching integration[J]. *Sichuan Architecture*, 2023, 43(06): 282-285.
4. Ma Xiaohui. Research on the Path of Cultivating Innovation and Entrepreneurship Ability of College Students in the Context of Industry-Education Integration[J]. *Industrial Innovation Research*, 2023, (14): 196-198.