

Research on the Teaching of Innovation and Entrepreneurship Courses in Vocational Undergraduate Colleges

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Abstract. This article focuses on the characteristics of innovation and entrepreneurship education courses in vocational undergraduate colleges. It analyzes the current situation of innovation and entrepreneurship courses both domestically and internationally, taking into account the current employment situation. The research examines the teaching content and methods of the courses and adjusts the course content based on the survey results. Additionally, it emphasizes the application of scales during the teaching process, such as the Holland Vocational Tendencies Test, Career Obstacles Test, and the 16 Personality Factors test (Cattell's 16PF). Through these tests, students gain a clearer understanding of their vocational tendencies and strengths.

Keywords: innovation; undergraduate colleges; entrepreneurship; Career Obstacles Test

1 Introduction

Entrepreneurship education for college students is one of the current research and focus areas in higher education[1]. In recent years, with the strong promotion by the Ministry of Education, universities across the country have established corresponding innovation and entrepreneurship cultivation courses. During the graduation season, various universities have also organized a variety of innovation and entrepreneurship activities on campus, providing a favorable development background and convenient channels for college students' innovation, entrepreneurship, and employment[2]. These efforts have made significant contributions to improving the students' learning and employment rates.

On January 24, 2019, the State Council of China issued the "National Vocational Education Reform Plan," officially establishing the "pilot program for undergraduate-level vocational education" and incorporating vocational undergraduate education into the high-level applied talent training system[3]. Industry-education integration refers to a teaching model that closely combines industry and education and integrates deeply with enterprises for talent cultivation. As one of the first batch of pilot institutions for undergraduate-level vocational education, Hainan Vocational and Technical College explores innovation and entrepreneurship courses for vocational undergraduates with a focus on improving employment rates and industry-education

integration. It aims to enhance the effectiveness and relevance of entrepreneurship education for college students and develop a set of innovative and entrepreneurial education courses suitable for graduates of vocational undergraduate colleges.

2 Current situation analysis

China's innovation and entrepreneurship education started in 2002, initially implemented as a pilot program in universities such as Tsinghua University, Shanghai Jiao Tong University, and Xi'an Jiao Tong University. The education on innovation and entrepreneurship was integrated into the educational system. With the government's promotion, all universities have now established corresponding talent cultivation courses in innovation and entrepreneurship and implemented various entrepreneurial activities, providing convenient channels for college students' innovation and entrepreneurship. However, in terms of the number of students choosing entrepreneurship, the proportion is less than 10% compared to Western countries. This indicates that there is still a certain gap between China's talent cultivation system for innovation and entrepreneurship and that of developed countries.

In recent years, research on entrepreneurship education for college students in China has significantly increased. The main areas of research include the current status and issues of cultivating entrepreneurial abilities among college students, the study of the employment capacity structure of college students and its influencing factors, and research on entrepreneurship education for college students in vocational undergraduate colleges.

Research by foreign scholars on college students' employment capacity started early. From Feintuch's introduction of the concept of "employment capacity" in 1955 to the present day, foreign scholars have been studying college students' employment capacity for over 60 years. Different researchers have explored college students' employment capacity from various perspectives, resulting in a wealth of research achievements.

3 Implementation plan and implementation schedule

3.1 Research content and research objectives

1) Research on the Teaching Content of "Innovation and Entrepreneurship Education Courses for Vocational Undergraduates" with a Goal-Oriented and Industry-Academia-Research Integration Approach.

The teaching content is the core focus of this research. After preliminary discussions, the research team has decided to design the course content based on three key areas of student concern: employment, entrepreneurship, and innovation. In designing the course content, the following aspects have been taken into consideration:

(a) Before students start looking for jobs, it is important for them to have a comprehensive understanding of themselves, including their strengths and weaknesses. They need to know their personality traits and knowledge backgrounds to determine which fields of work are more suitable for them. Therefore, after the introduction to the course, tests such as the Holland Vocational Tendencies Test [4], Career Obstacles Test, and the Cattell's 16 Personality Factors

Test [5] are conducted. Through these tests, students can gain a clear understanding of their personality, vocational tendencies, and obstacles. They can identify their strengths and weaknesses, which will help them make informed decisions in their future career choices.)

(b) Through research conducted during the course introduction, it was found that many students majoring in fields such as Internet of Things and Big Data were uncertain about the job prospects after graduation. Many of them did not know what they could do after graduation. To address this situation, in the third chapter of this course, the organizational structure of companies, job responsibilities in various departments, and the requirements for different positions within these departments are explained. This helps students develop a clearer understanding of the corporate world.

(c) Employment is an important component of this course. We have allocated two chapters to discuss resume writing, including the core aspects and key points of resume writing. We will also cover how to prepare for interviews, common interview questions, and organize mock interviews for students.

(d) For students with entrepreneurial aspirations, the sixth chapter of this course introduces ten steps to entrepreneurship. It covers aspects such as selecting a business project, developing an outline for a business plan, and preparing startup capital. This aims to equip students with a basic understanding of the entrepreneurial process and knowledge

(e) Innovation is another component of this course. In this section, we will introduce the TRIZ (Theory of Inventive Problem Solving) innovation theory [6]. We will teach the theory and application of the TRIZ innovation method and present two case studies to illustrate the specific application of TRIZ in innovation. The aim is to continuously broaden students' innovative thinking and approach.

Please refer to Table 1 for the specific design of the teaching content.

Table 1. Teaching Content and Class Hours Allocation Table

| Weeks | Chapters | Teching Content | Class Hours | Lecture | Practi ce |
|-------|-----------|----------------------------------------------------------------------------------------|-------------|---------|-----------|
| 1 | Chapter 1 | Course Introduction | 2 | 1 | 1 |
| 2 | Chapter 2 | Holland Career Interest Test, Career Barriers Test, Personality Test | 4 | 2 | 2 |
| 3 | Chapter 3 | Enterprise Organizational Structure, Department Responsibilities, and Job Requirements | 4 | 3 | 1 |
| 4 | Chapter 4 | Resume Writing | 4 | 2 | 2 |
| 5 | Chapter 5 | Interview Skills and Mock Interviews | 2 | 0 | 2 |
| 6 | Chapter 6 | Ten Steps for Entrepreneurship | 4 | 2 | 2 |
| 7 | Chapter 7 | TRIZ Innovation Theory | 4 | 2 | 2 |

| | | | | | |
|---|-----------|----------------------------------------------------|----|----|----|
| 8 | Chapter 8 | How to Master a Skill and Build a Knowledge System | 4 | 2 | 2 |
| 9 | Chapter 9 | Writing a Business Plan | 4 | 0 | 4 |
| | Total | | 32 | 14 | 18 |

3.2 Implementation plan

Research on the teaching of the innovation and entrepreneurship course is divided into three parts: innovation, job, and entrepreneurship. Implementation Plan as shown in Fig 1.

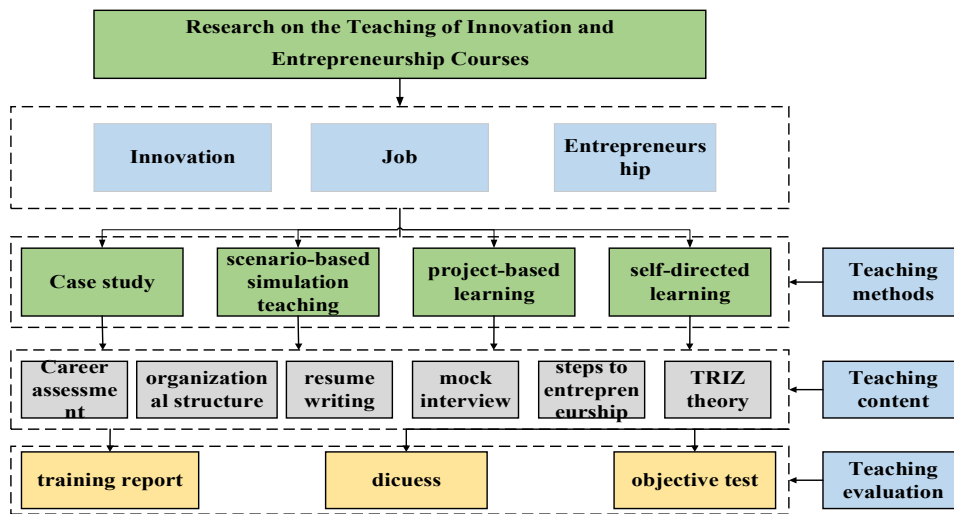


Fig.1 Architecture of the plan

4 Results

The teaching tasks for the first semester of the 2022-2023 academic year have been conducted according to the aforementioned plan in three classes(The participant information as shown in Fig2). The students involved are from the 2019 batch of the Internet of Things and Big Data majors in the School of Information Engineering. So far, 238 students have completed the assessments. We use the psychology cloud (<http://xyjx.psychcloud.com.cn/xyjx/login.jsp>),The result as shown in Fig.3 and Fig.4

| Sequence Number | Age | Sex | Profession | Education | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 | F10 | F11 | F12 |
|-----------------|-----|--------|------------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | 20 | male | Student | Bachelor | 15.00 | 3.00 | 10.00 | 18.00 | 8.00 | 9.00 | 11.00 | 7.00 | 14.00 | 7.00 | 12.00 | 11.00 |
| 2 | 19 | male | Student | Bachelor | 4.00 | 10.00 | 10.00 | 14.00 | 10.00 | 12.00 | 13.00 | 12.00 | 8.00 | 16.00 | 8.00 | 4.00 |
| 3 | 18 | male | Student | Bachelor | 10.00 | 10.00 | 18.00 | 10.00 | 18.00 | 12.00 | 9.00 | 9.00 | 7.00 | 16.00 | 6.00 | 7.00 |
| 4 | 19 | female | Student | Bachelor | 5.00 | 7.00 | 11.00 | 10.00 | 18.00 | 11.00 | 14.00 | 6.00 | 7.00 | 13.00 | 12.00 | 10.00 |
| 5 | 19 | male | Student | Bachelor | 2.00 | 7.00 | 16.00 | 10.00 | 7.00 | 13.00 | 4.00 | 8.00 | 4.00 | 7.00 | 8.00 | 6.00 |
| 6 | 20 | male | Student | Bachelor | 14.00 | 9.00 | 13.00 | 9.00 | 13.00 | 13.00 | 8.00 | 10.00 | 5.00 | 15.00 | 11.00 | 13.00 |
| 7 | 21 | male | Student | Bachelor | 11.00 | 7.00 | 9.00 | 6.00 | 12.00 | 6.00 | 8.00 | 12.00 | 13.00 | 11.00 | 8.00 | 13.00 |
| 8 | 21 | female | Student | Bachelor | 10.00 | 9.00 | 9.00 | 5.00 | 10.00 | 11.00 | 3.00 | 10.00 | 10.00 | 14.00 | 11.00 | 16.00 |
| 9 | 20 | male | Student | Bachelor | 7.00 | 9.00 | 7.00 | 10.00 | 13.00 | 13.00 | 13.00 | 12.00 | 13.00 | 11.00 | 11.00 | 14.00 |
| 10 | 20 | male | Student | Bachelor | 11.00 | 5.00 | 15.00 | 10.00 | 19.00 | 16.00 | 15.00 | 5.00 | 8.00 | 12.00 | 13.00 | 12.00 |
| 11 | 19 | male | Student | Bachelor | 8.00 | 6.00 | 11.00 | 14.00 | 12.00 | 10.00 | 9.00 | 11.00 | 14.00 | 15.00 | 11.00 | 14.00 |
| 12 | 18 | female | Student | Bachelor | 10.00 | 7.00 | 16.00 | 11.00 | 14.00 | 9.00 | 13.00 | 13.00 | 15.00 | 13.00 | 10.00 | 14.00 |
| 13 | 19 | male | Student | Bachelor | 3.00 | 9.00 | 17.00 | 11.00 | 14.00 | 12.00 | 14.00 | 10.00 | 8.00 | 12.00 | 12.00 | 8.00 |
| 14 | 20 | male | Student | Bachelor | 2.00 | 11.00 | 11.00 | 6.00 | 8.00 | 12.00 | 2.00 | 15.00 | 7.00 | 11.00 | 11.00 | 17.00 |
| 15 | 21 | male | Student | Bachelor | 10.00 | 3.00 | 14.00 | 13.00 | 12.00 | 10.00 | 9.00 | 10.00 | 15.00 | 13.00 | 13.00 | 13.00 |
| 16 | 20 | male | Student | Bachelor | 8.00 | 8.00 | 13.00 | 10.00 | 10.00 | 11.00 | 15.00 | 12.00 | 9.00 | 13.00 | 9.00 | 14.00 |
| 17 | 19 | male | Student | Bachelor | 10.00 | 1.00 | 17.00 | 11.00 | 9.00 | 10.00 | 11.00 | 10.00 | 16.00 | 11.00 | 12.00 | 15.00 |
| 18 | 18 | female | Student | Bachelor | 13.00 | 8.00 | 16.00 | 13.00 | 10.00 | 12.00 | 9.00 | 9.00 | 7.00 | 13.00 | 11.00 | 3.00 |
| 19 | 20 | female | Student | Bachelor | 8.00 | 7.00 | 16.00 | 8.00 | 10.00 | 17.00 | 5.00 | 7.00 | 5.00 | 15.00 | 12.00 | 6.00 |
| 20 | 20 | male | Student | Bachelor | 9.00 | 8.00 | 15.00 | 17.00 | 20.00 | 10.00 | 12.00 | 13.00 | 10.00 | 18.00 | 11.00 | 14.00 |
| 21 | 20 | female | Student | Bachelor | 13.00 | 6.00 | 13.00 | 10.00 | 11.00 | 13.00 | 8.00 | 13.00 | 9.00 | 13.00 | 13.00 | 17.00 |

Fig.2 Participant Information

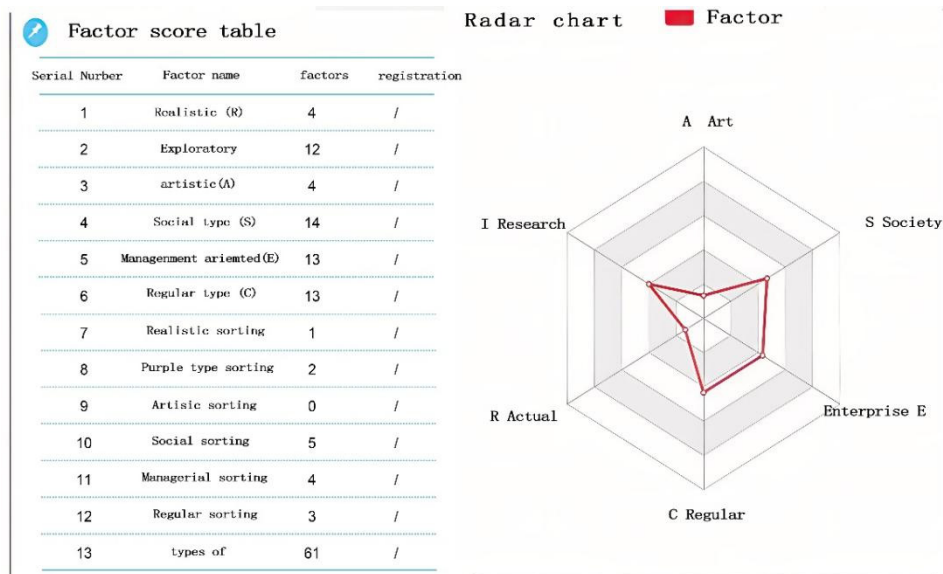


Fig 3 The result of cloud

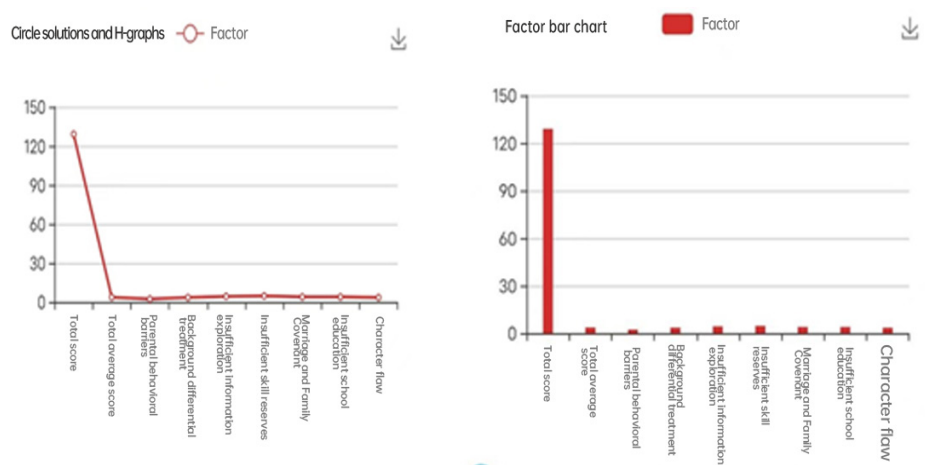


Fig 4. The result of cloud

5 Innovation and conclusions

This course is designed to integrate industry and education, focusing on vocational undergraduate characteristics, and closely aligning with employment, entrepreneurship, and innovation. During the teaching process, it closely combines the characteristics of vocational undergraduate education, with the aim of improving employment rates. Building upon the existing innovation and entrepreneurship content, the course has added employment-related topics, emphasizing the explanation of knowledge related to employment. This includes topics such as writing effective resumes, highlighting key resume content, preparing for interviews, and establishing connections with recruiting companies. Additionally, students are required to write resumes based on their own job-seeking situations, and mock recruitment and interview sessions are organized for students to participate in.

We have added scale tests to allow students to have a better understanding of themselves and clarify their future career plans. The students have completed the Holland Occupational Interest Inventory (HOII) test, the perceived career barriers test, and the Cattell 16 Personality Factors (16PF) test. Through these tests, students gain a clear understanding of their personality traits, strengths, weaknesses, and suitable job types. This provides them with guidance for future employment and entrepreneurship endeavors.

We adopt a combination of online and offline teaching methods. We actively promote the integration of online and offline teaching by utilizing platforms such as Tencent Meeting and Yu Class. Guided by the teaching syllabus, we seamlessly integrate teaching content and methods, employing various effective teaching approaches to enhance students' enthusiasm and proactivity in learning.

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