The Structure and Influencing Factors of Innovation and Entrepreneurship Ability of Higher Vocational Students Based on Structural Equation Model

Fei Sun¹², Liping Bai² *, Wenhao Wang ³

1. Innovation and Entrepreneurship School, Hangzhou Vocational and Technical College, Hangzhou, 31000, Zhejiang China,

2. Graduate School, Lyceum of the Philippines University, Manila, 1002, Philippines

3. Graduate School, The University of Manila, Manila, 1002, Philippines

Abstract

The academic circles have always been concerned about the employment problem of vocational students. We use the inductive analysis method to obtain vocational students' innovation and entrepreneurship ability. Then we verified the six aspects of vocational students' innovation and entrepreneurship ability through the structural equation model. The research shows that entrepreneurial risk perception has a significant negative impact on entrepreneurial intention. Innovation motivation has a significant negative impact on entrepreneurial risk perception. Based on this model, we propose relevant strategies for improving the entrepreneurial ability of vocational students.

Keywords: Vocational students; Entrepreneurship; Structural equation model; Influencing factors

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1. Introduction

In recent years, Chinese entrepreneurial activities have received more and more attention. The state should implement the development strategy of expanding employment and promoting employment through entrepreneurship. In the global financial crisis, China is not immune to this. The financial crisis has significantly reduced the ability of companies to absorb graduates. The difficult employment situation has led to entrepreneurship becoming Chinese focus and society. Economic development requires the transformation of many innovation and entrepreneurship achievements [1]. Every year, many achievements to be transformed emerge from the innovation and entrepreneurship competitions of various types of higher vocational students in China. At present, various types of innovation and entrepreneurship competitions

*Corresponding author.
Email address: bailiping1990@163.com

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at all levels represented by the "Challenge Cup" competition are widely carried out in academia. Many students have improved their comprehensive quality and ability through the competition. The competition is limited by capital, technology, talent, system, and other conditions, so many vocational students' innovation and entrepreneurship achievements have not been industrialized.

On January 19, 2009, the General Office of the State Council issued the "Notice on Strengthening the Employment of Graduates of Ordinary Colleges and Universities." The document requires that the employment of college graduates be given the top priority in current employment. The document proposes a series of policy measures. Self-employment is an important growth point for the employment of higher vocational students. Still, according to relevant surveys, it is found that the proportion of self-employment among fresh graduates is only 0.3%. Starting a business is difficult [2]. Therefore, the current academic research on entrepreneurship-related theories of vocational students has gradually become a hot spot in recent years.

2. The Entrepreneurship Model of Vocational Student Entrepreneurs

Starting a business is risky. Every entrepreneur wants to succeed. Entrepreneurship is directly related to the success of entrepreneurship. Therefore, this paper introduces the concept of entrepreneurship [3]. Entrepreneurship refers to the ability or strength to successfully start a business. Many factors influence entrepreneurial success. In a certain market environment, the key is to look at the operation ability, innovation ability, and risk management ability of entrepreneur resources and the system and cultural environment of entrepreneurial enterprise operation. This paper mainly analyzes the relevant factors affecting entrepreneurship from the perspective of higher vocational student entrepreneurs. Based on the research theory of cognitive psychology, we construct a model of the entrepreneurial ability of higher vocational student entrepreneurs. This paper is based on the creativity model of American psychologist Sternberg in constructing the entrepreneurial ability model. American psychologist Sternberg and others believe that individual creativity is related to various factors such as intelligence, knowledge, thinking mode, personality (personality), motivation, and environment. The relevant model can be expressed as:

\[ C = F(I, K, TS, P, M, E) \]  \hspace{1cm} (1)

C is for creativity. I am intelligent. K is knowledge. TS is the mode of thinking. P is for personality. M is motivation, and E is the environment.

Sternberg's theory is a model of creativity for the general individual. However, the theory should have its uniqueness to the entrepreneurial ability of higher vocational students [4]. The following is an analysis of the entrepreneurial attributes of higher vocational student entrepreneurs.

(1) Studies have shown that after the individual IQ reaches a general level, the impact of intelligence on entrepreneurship is small. Therefore, the question of intelligence and creativity is irrelevant when the individual possesses the basic abilities of an entrepreneur. The latest research also shows that East Asians have higher average IQ tests than Caucasians in the United States and Asia [5]. East Asians are no more creative than Americans.

(2) Personality refers to the courage and courage of an individual entrepreneur. Today's entrepreneurship is more and more a process of group collaboration. More and more entrepreneurial activities are teamwork. This can compensate for differences in individual personalities. According to risk transfer theory, groupthink is more prone to risk-taking.

(3) Motivation refers to the entrepreneur's desire to start a business. This is closely related to entrepreneurs' willingness to participate in entrepreneurial activities. At the same time, it has a strong correlation with the various environments of the entrepreneur's own family and society. For example, many entrepreneurs face a lot of financial pressure in starting a business.

†Corresponding author.
Email address: *xx@xx*
Society and family provide a strong driving force for their entrepreneurial success [6]. The influence curve of motivation on entrepreneurship is shown in Figure 1. If the motivation exceeds the M point, it will have a side effect on the entrepreneurial power of the entrepreneur. This leads to a decline in entrepreneurship.

![Figure 1](image1.png)

**Figure 1** The influence curve of motivation on entrepreneurship

(4) The environment is the entrepreneur's family, social, and cultural environment. The current global and Chinese environment encourages and promote entrepreneurship. However, the family environment of different entrepreneurs differs greatly in their support for entrepreneurship. For example, many families generally believe that the job chosen by the entrepreneur is very risky. Entrepreneurship is not as stable as civil servants and public institutions. This hinders the entrepreneurial activities of entrepreneurs to a certain extent.

(5) Knowledge is the key attribute of entrepreneurial ability [7]. This is a very important foundation. It has a positive guiding effect on further entrepreneurial activities. The knowledge requirements in entrepreneurship are different from common knowledge. Entrepreneurship requires cutting-edge and leading professional knowledge on the one hand and certain knowledge in marketing, business operations, and financial management on the other. Entrepreneurs should be good at combining knowledge with the market and effectively transforming knowledge into productivity. Figure 2 shows the effect of knowledge on entrepreneurship. Point K is the intersection of professional knowledge and marketing and management knowledge, which is the most suitable for carrying out entrepreneurial activities.

![Figure 2](image2.png)

**Figure 2** The influence curve of knowledge on entrepreneurship

(6) Entrepreneurial opportunities. Entrepreneurs' identification and capture of entrepreneurial opportunities is a critical factor in entrepreneurial activities. This is also a key factor in determining the success of future entrepreneurial activities. Entrepreneurial opportunities are external information to entrepreneurs. We can represent what, when, where, how, who, etc.

†Corresponding author.
Email address: *xx@xx*
Experience also plays a huge role in entrepreneurial activities. This provides entrepreneurs with a reference for entrepreneurial activities to guide them to carry out entrepreneurial activities. But experience also has certain limitations in entrepreneurial activities [8]. The influence curve of experience on entrepreneurship is shown in Figure 3. Exceeding the point E is likely to cause entrepreneurs to have a certain mindset and prevent them from discovering better entrepreneurial opportunities.

Figure 3 The influence curve of experience on entrepreneurship

Entrepreneurial skills are the ability of entrepreneurs to participate in entrepreneurial activities. It has a positive effect on entrepreneurship, and the impact of skills on entrepreneurship is positively correlated [9]. The stronger the entrepreneurial skills, the stronger the entrepreneurial ability of the entrepreneur. The impact curve of skills on entrepreneurship is shown in Figure 4.

Figure 4 The impact curve of skills on entrepreneurship

Another important factor that affects the entrepreneurial ability of entrepreneurs is entrepreneurial support. The content mainly includes financial support, policy support, and legal and regulatory support. These support environments directly affect the improvement of entrepreneurs' entrepreneurship, which can assist entrepreneurs in carrying out various entrepreneurial activities [10]. The entrepreneurial ability model of higher vocational student entrepreneurs can be qualitatively expressed as:

\[ BF = F(M, K, S, EX, BO, BS, E) \]
Among them, BF is entrepreneurship. M is the motive. K is knowledge. S is a skill. EX is experience. BO is an entrepreneurial opportunity. BS for Entrepreneurial Support and E for Entrepreneurial Environment.

Among them $BS = F(FS, PS, LS), FS$ is financial support. PS is policy support. LS is legal and regulatory support. We effectively combine the model's key attributes to obtain the entrepreneurial ability model framework based on higher vocational students, as shown in Figure 5. The bottom layer of this framework model is entrepreneurial motivation. It depends on the entrepreneur's own desire to start a business. Knowledge, experience, and skills are the middle layers of the framework model [11]. This layer is mainly realized through the learning and practice process of entrepreneurs. Entrepreneurial opportunities, entrepreneurial support, and entrepreneurial environment are the top layers of the framework model. It is mainly obtained through entrepreneurs' integration and utilization of external resources.

![Diagram](image)

**Figure 5** Framework diagram of the entrepreneurial ability model of higher vocational students

3. **Verification of the model of entrepreneurship of vocational students**

From the above analysis, we have obtained a vocational students' entrepreneurship model. The model makes a comprehensive analysis of the factors related to the impact of entrepreneurship. We further verify the effectiveness of this model.

Only 10% of the entrepreneurs are engineering majors. Economics majors are the most, accounting for 26.3%. The second is management majors, accounting for 14.3%. The report shows that 32.7% of the graduates of vocational student entrepreneurs are not profitable. 48.4% of the monthly income is less than 0 to 30,000 yuan. 0.3 ~ 10,000 yuan accounted for 16.1%. 1 to 50,000 yuan accounted for 1.9%. More than 50,000 yuan accounted for only 0.8%. 63.2% of the vocational student entrepreneurs in the school have no profit, and 24% have an entrepreneurial income of less than 500 yuan. 500 ~ 1000 yuan accounted for 10.1%. 1,000 to 3,000 yuan accounted for 1.8%. 3000 ~ 5000 yuan accounted for 0.5%. More than 5,000 yuan accounted for only 0.4%. We use regression models to study the state of vocational students' participation in entrepreneurship. We divide the results of vocational students' participation in entrepreneurship into two categories: participation or non-participation. The general regression model is due to the variable value range between positive and negative infinity. The status of students participating in the Entrepreneurship Competition is divided into participation or non-participation. The value is in the range [0,1]. Therefore, we use the logistic regression model of binary dependent variables to estimate its regression parameters.

*Corresponding author.
Email address: *xx@xx*
by using the maximum likelihood estimation method. The model assumes that there is an unobserved latent variable that $m_i$ has a linear relationship with it, namely:

$$m_i = n\beta + \mu_i \quad (\mu_i \text{ is the distractor}) \quad (3)$$

We set $B$ equal to 1 when $m_i$ is greater than the critical value state. When $m_i$ is less than or equal to zero, $m_i$ is equal to 0, and the relationship is as follows:

$$m_i = \begin{cases} 
    m_i > 0 \\
    m_i \leq 0
\end{cases} \quad (4)$$

When the critical value is 0, as long as $x_i$ is a non-zero constant term, the choice of the critical value has nothing to do with the choice of the constant term. Here we set $x_i$ to 0, then we have:

$$F(m_i = 1| n_i, \beta) = F(m_i > 0) = F(\mu_i > n\beta) = 1 - P(-n\beta) \quad (5)$$

$$F(m_i = 1| n_i, \beta) = F(m_i \leq 0) = F(\mu_i > n\beta) = 1 - P(-n\beta) \quad (6)$$

$P$ in the above formula is a distributed continuous function of $\mu_i$. Monotonically increasing, the original regression model becomes:

$$m_i = 1 - P(-n\beta) + \mu_i \quad (7)$$

The maximum likelihood value generally estimates the binary logistic selection regression model. The log-likelihood function is:

$$\ln L = \sum_{i=1}^{n} [m_i \ln P(n_i, \beta) + (1 - m_i) \ln[1 - P(n_i, \beta)]] \quad (8)$$

The first-order condition of the log-likelihood function is:

$$\frac{\partial \ln L}{\partial \beta} = \sum_{i=1}^{n} \frac{m_ip_i}{p_i} + (1 - m_i) \frac{-p_i}{(1 - p_i)} n_i = 0 \quad (9)$$

If the Logit distribution function and the density function are substituted into the above formula, the maximum likelihood estimation of the model's parameters can be obtained. The estimated coefficients in the binary choice model cannot be interpreted as having a marginal effect on the dependent variable. We can only judge from the symbols. If it is positive, it means that the explanatory variable is larger. The greater the probability that the dependent variable takes 1. Conversely, the corresponding probability will be smaller if the coefficient is negative.

We set the value of $m$ to "0" and "1" to indicate whether it has started a business or not. n1-n8 represents eight aspects, including gender, age, education level, family income level, work experience, training, policy support, and financial support. We brought these variables into the model to test and got a good fit.

4. Strategies for improving the entrepreneurship of vocational students

According to the basic entrepreneurship theory, we define entrepreneurship that pursues self-realization, enhances and explores the value of life as opportunistic entrepreneurship. This type of entrepreneur sees entrepreneurship as a career option. And to survive and make a living for entrepreneurship, we define it as survival entrepreneurship. In the later stage of entrepreneurship, according to the relevance of the industrial chain and the similarity of industries, entrepreneurs will selectively focus on development. This forms the agglomeration effect of entrepreneurship. Different startups adopt different promotion strategies.

(1) Promotion strategies for survival entrepreneurs. Survival entrepreneurs have strong entrepreneurial motives because they are under greater pressure in life. At this stage, entrepreneurs have very limited entrepreneurial resources lack entrepreneurial skills and entrepreneurial experience. In this stage, the most important thing is to identify

Corresponding author.
Email address: *xx@xx*
entrepreneurial opportunities, select business opportunities, and integrate resources through external forces to seize entrepreneurial opportunities. Vocational student entrepreneurs should exercise scientific knowledge, intellectual ability, thinking structure, personality characteristics, internal motivation, and other aspects. This can stimulate more entrepreneurial creativity. Entrepreneurs of higher vocational students should pay special attention to participating in rich extracurricular innovation and entrepreneurship activities to broaden access to various information acquisition channels. Students should pay attention to the acquired knowledge and practical ability to enhance the acquisition, identification, and application of practical entrepreneurial information. Vocational students should broaden their social circles during their studies in school. Efforts to reach out to social groups with different industry backgrounds and knowledge levels. In particular, the front-line entrepreneurs in various industries are closely connected. The common factors of entrepreneurial success need to be carefully observed and considered. In addition, due to the lack of knowledge, experience, and skills of the entrepreneurs of higher vocational students at this stage, higher vocational students are required to expand their knowledge during the period of reserve in school. Students can increase entrepreneurial knowledge and improve entrepreneurial skills by participating in competitions and enhancing multidisciplinary exchanges.

(2) Promotion strategies for developmental entrepreneurs. Developmental entrepreneurs have a great sense of identity with entrepreneurial activities. Students accumulate certain experiences and skills through the early survival period. Developmental entrepreneurship faces more challenges. Enterprises continue to grow, and the social resources and market shares they occupy continue to increase. The emergence of competitors will make enterprises face a complex market competition environment in the early stage of business. At this time, entrepreneurs must seek more powerful entrepreneurial partners to join in to form a more powerful entrepreneurial team. At the same time, entrepreneurs need to establish a scientific operation management model that adapts to the development of their enterprises. At this time, it is necessary to continuously improve resource use efficiency to serve the growth of enterprises. Higher vocational student entrepreneurs need to improve their management abilities at this stage. On the one hand, entrepreneurs can improve their management knowledge in personnel, finance, operation, logistics, supply, marketing, etc., through universities or various education and training institutions. On the other hand, through problem-solving in entrepreneurial practice, the ability is exercised. In addition, entrepreneurs should make full use of various resources at the giving stage. At the same time, with the help of financial support and policy support to maximize resources.

(3) The promotion strategy of accumulating entrepreneurs. Vocational students have a comprehensive understanding of online shopping and online commerce. Relying on the Internet, the venture capital is small, the risk is low, and the basic configuration requirements such as physical storefronts are not high. This can also reflect the individual characteristics of entrepreneurs. The entrepreneurial approach is flexible and convenient. The concentrated development of entrepreneurial enterprises of vocational students will promote the exchange of entrepreneurial information and knowledge and create new technologies and new ideas. They bring together capital, land, labor, and services to form economies of scale. This can maximize the efficiency of entrepreneurial resources and enhance the core competitiveness of the regional entrepreneurial industry.

5. Conclusion
The conclusion shows that the level of education, work experience, training, policy support, and financial support is proportional to the success rate of entrepreneurship. This is consistent with the analysis results of the corresponding elements in our entrepreneurship model. The
conclusions obtained in this paper verify the validity and feasibility of the entrepreneurial model.

References


†Corresponding author.
Email address: *xx@xx*