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Study and improvement on the competence model of talents with entrepreneurial skills in colleges and universities in the process of industrialization

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ABSTRACT

The Chinese chairman, Jinping XI, has made a summary on the direction of China's economic development. The chairman XI says China will adopt a high, refined and cutting-edge science and technology to promote the development of the economy in the future, using the innovative ways to complete the transformation of the productivity. This kind of economic development way requires that China needs to have a number of talents with entrepreneurial skills becoming a backbone of society. In the process of the industrialization, the colleges and universities should adopt an advanced talent training mode to cultivate a batch of entrepreneurial talents, making their competence to meet the demands of the society. So it is very important to establish a competence model of talents with entrepreneurial skills. Only to set up a scientific competence model of talents with entrepreneurial skills, the higher education institutes enable to take this model as the goal to create a large number of entrepreneurial talents. This study uses references, data statistics and data analysis to get a set of competence model of talents with entrepreneurial skills in colleges and universities in the process of industrialization. In order to make the model more accurate, it puts forward a set of abstract evaluation model according to the competence theory of entrepreneurial talents in colleges and universities in the process of the industrialization. This study applies the method of analysis of the weight to modify the model, eventually making it enable to accurately reflect the competences of entrepreneurial talents who should have. Using the competence model of talents with entrepreneurial skills in colleges and universities which is put forward by this study can make each higher education institute understand the direction of cultivating the entrepreneurial talents. In the future, the university teachers will need to take the model as the direction to guide students to learn and cultivate the talents with entrepreneurial skills, making the competence of talents enable to meet the business requirements.

KEYWORDS

Industrialization; Colleges and universities; Talents with entrepreneurial skills; Model.



INTRODUCTION

The so-called entrepreneurship is to innovate a theory, initiate a performance and create a result on the basis of predecessors. The pioneering results can be the innovation in materially, mentally and technically, etc^[1]. If a country has a group of talents who can start a business, it can develop rapidly. In the late 1980s, China accepts the foreign advanced education and puts forward the concept of entrepreneurship education^[2]. Then this concept can be divided into the broad and narrow sense. Broadly speaking, entrepreneurship education is to develop a batch of talents with the pioneering consciousness, entrepreneurial psychology, entrepreneurial ability, and entrepreneurial knowledge; From the narrow sense, it is to cultivate a group of business talents who can start the business independently^[3]. And the concept of modern entrepreneurial talent cultivation is to let the talents to possess the comprehensive competence of entrepreneurship, rather than swaying their wish. The study is based on the competence theory of entrepreneurial talents of colleges and universities to establish a competence model of talents, and based on the psychology to amend the model. After the verification, the model can reflect the competences which the talents should have.

THE THEORY OF THE COMPETENCE MODEL OF TALENTS WITH ENTREPRENEURIAL SKILLS IN COLLEGES AND UNIVERSITIES IN THE PROCESS OF INDUSTRIALIZATION

The competence theory of talents with entrepreneurial skills

In the market competition environment, the talents will encounter a variety of market opportunities, face various risks and meet all kinds of cooperation partners. If they can seize the opportunities, find the cooperative partners and avoid market risks, they will be able to successfully start a business^[5]. Figure 1 is the description of competence model of talents with entrepreneurial skills. It emphasizes that entrepreneurial talents should have the ability to grasp the business opportunities, ability to collect resources and create a team. In this model it mainly focuses on the three abilities that are communication, leadership and creativity for the entrepreneurial talents.

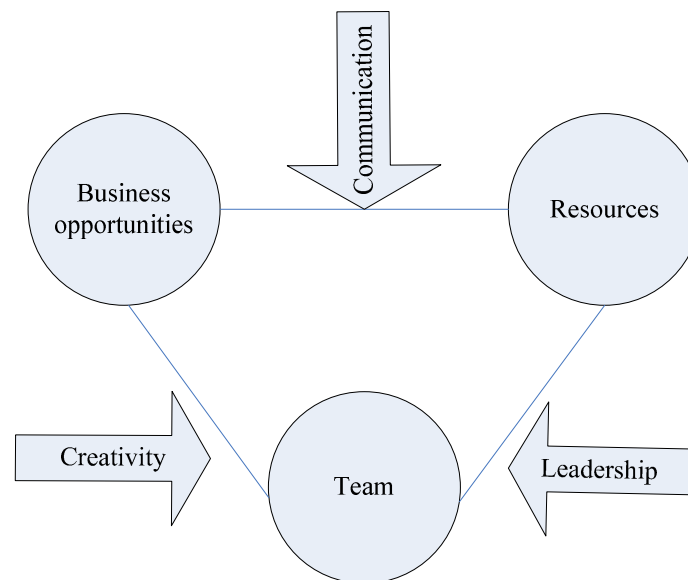


Figure 1 : The competence model of talents with entrepreneurial skills

The potential theory of talents with entrepreneurial skills

By the research and evaluation from psychologists, it is found that becoming the entrepreneurial talents must have enough potential which can be described as figure 2. It means that the talents with entrepreneurial skills can seize their own status and create their own chances of success. Because if the talents have self-fulfilling intrinsic demands, they will manage to establish a business; The talents have the unique personality characteristics which can pave their entrepreneurial way; The talents also have a desire for the entrepreneurial motivation, and the extrinsic motivation can encourage the talents to determine to start a business. The above four characteristics are the potential career consciousness of talents^[6], and it shows the result that the talents will consciously cultivate and use their own knowledge skills to start a business.

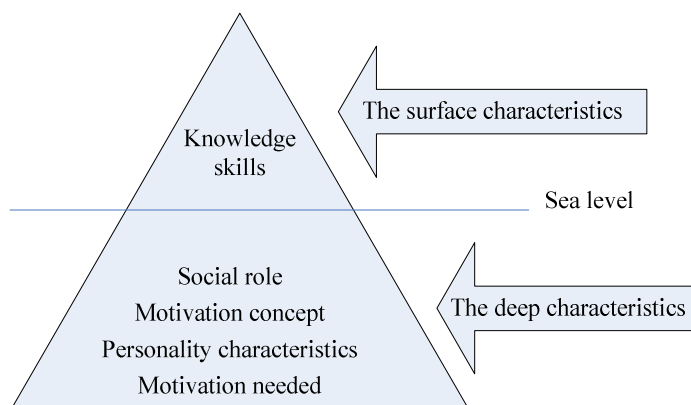


Figure 2 : The potential model of talents with entrepreneurial skills

The platform theory of talents with entrepreneurial skills

To make the college students to have the ability of grasping the market opportunity and the potential competence, it is needed to offer a platform of entrepreneurship education for the college students, through which the students can find their own potential and spontaneously cultivate their own ability according to their potential; And this platform can help the students and let them quickly learn what they want to learn^[7]. On the platform of entrepreneurship education, the college students can become different types of entrepreneurial talents.

Figure 3 is the platform theory model of talents with entrepreneurial skills. In the teaching model, teachers should give students a learning theory, letting the students have the consciousness of entrepreneurship; By cultivating students' professional skills, the teachers can make the students understand the business information, so that the students are willing to take the theory combining the practice to start a business; Teachers guide the students to make a plan of entrepreneurship and create an opportunity of the business competition through which the students are aware of their potential; By the project teaching method, teachers give students a project for training, letting the students learn to complete the entrepreneurial activity by the team. Teachers guide students to participate in social practice, strengthening the students' ability of business practice; Students summarize their own business experience to promote the theoretical knowledge of learning and then for the next round of entrepreneurship. In this cultivating platform of entrepreneurial talents, student's entrepreneurial potential will be inspired and entrepreneurial abilities can be trained.

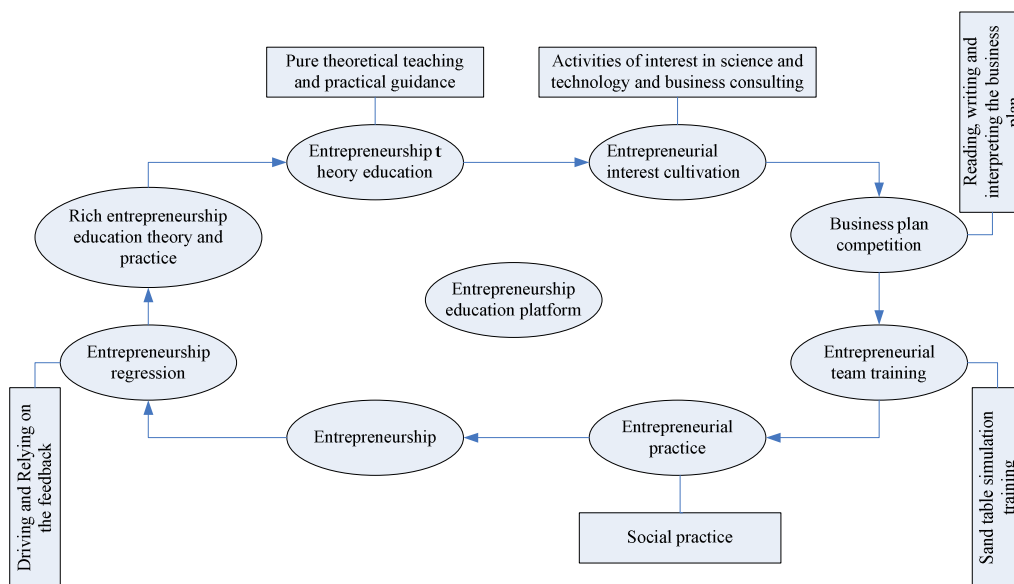


Figure 3 : The platform model of talents with entrepreneurial skills

The Establishment of the Competence Model of Talents with Entrepreneurial Skills in Colleges and Universities in the Process of Industrialization

The modeling of competence description of talents with entrepreneurial skills

By combination of the above competence theory of talents with entrepreneurial skills, it can comprehensively describe the competences of entrepreneurial talents, and it is described in TABLE 1:

TABLE 1 : The competence description of talents with entrepreneurial skills in colleges and universities

Competence Project	Competence Description	Competence Embodiment
Entrepreneurship potential	This is the inherent competence which students should possess in order to become the entrepreneurial talents, and it is the potential factors whether the students can successfully start a business or not.	<p>Consciousness of motivation: The students need to have a spontaneous idea of starting a business and achieve self-fulfillment through entrepreneurship;</p> <p>Psychological quality: The students need to have a stable behavior characteristics, be honest and trustworthy, and have rich sense of responsibility and the spirit of pragmatic dedication in the process of entrepreneurship;</p> <p>Spirit of innovation: Students need to have the spirit of perseverance, confidence, optimism on the basis of understanding themselves.</p> <p>Value orientation: Students need to have the spirit of team cooperation and are willing to take risks and not afraid of competition;</p> <p>Innovation ability: It refers to the ability to further innovate on the basis of the original knowledge;</p> <p>Social skills: It means students can effectively use the ability of others and the external resources when contacting with people;</p>
Entrepreneurial skills	It means that the students need to learn the ability to become a talent with entrepreneurial skills.	<p>Management ability: It refers to possess the operation capability in the process of entrepreneurship;</p> <p>Collaboration ability: It refers to show the ability of communication and cooperation with others in a team;</p> <p>Integration ability: It refers to effectively utilize content resources and external resources;</p> <p>Opportunity ability: It refers to enable to effectively grasp the business opportunities.</p> <p>Basic knowledge of business: It means that students need to learn the knowledge of how to create a company and how to run the company;</p> <p>Marketing knowledge: It means that the students need to know the operation mode, strategy and tactics which are associated with the market competition;</p>
Entrepreneurial Knowledge		<p>Legal strategy knowledge: It means that the students should understand the legal knowledge related to business, such as trademark act, property law, etc;</p> <p>Social etiquette knowledge: It means that the students need to know about the formal business etiquette and the customs of different countries and so on. It is very necessary for students to master the knowledge when conducting business exchanges with others</p>

Above table can be described in the method of model, as shown in Figure 4:

The weight of competence model of talents with entrepreneurial skills

Description for the weight of competence model of talents with entrepreneurial skills

Becoming the entrepreneurial talent, the college students do not need to have all the above competences at the same time, and also not need the average of above competences. Among the above competences needed for the entrepreneurial talents in universities, some are much more significant, and some relatively unimportant. Therefore, if the competence model of talents with entrepreneurial skills in colleges has been made, it has to calculate the weight and then revise the above model.

If the competence of talents with entrepreneurial skills in universities is set to P, entrepreneurial potential as P₁, entrepreneurial skills as P₂, entrepreneurial knowledge as P₃, then it is available to use a table to illustrate the weight ratio of the above competences according to the scientific research and statistics. The calculation is as follows TABLE 2, TABLE 3, TABLE 4 and TABLE 5:

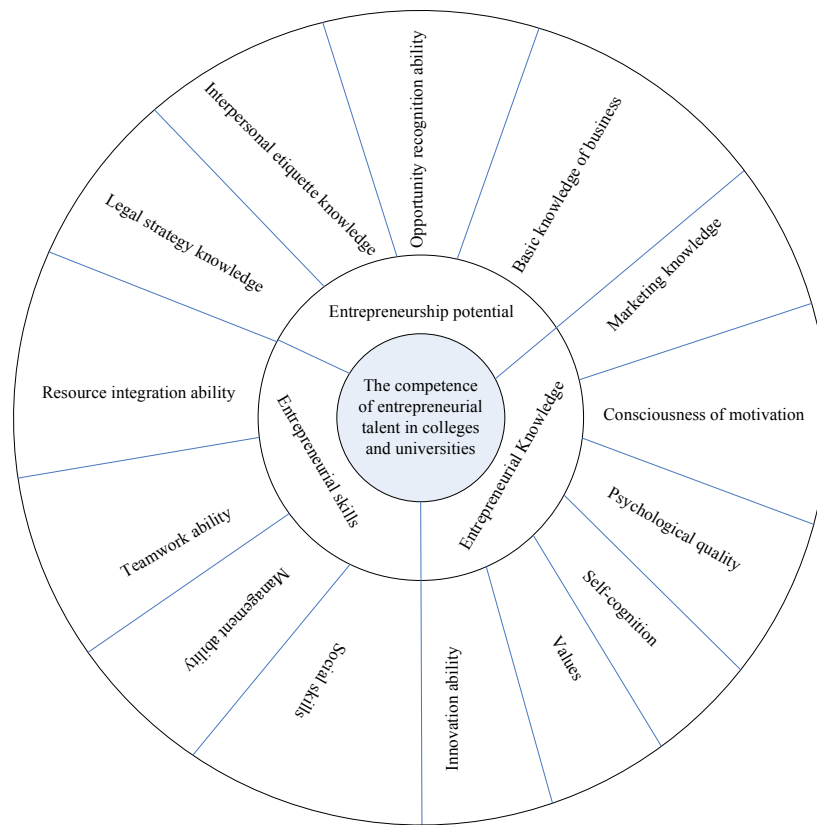


Figure 4 : The competence model of entrepreneurial talent in colleges and universities

TABLE 2 : The judgment matrix and weight of entrepreneurial ability p

P	Entrepreneurial potential P ₁	Entrepreneurial skills P ₂	Entrepreneurial knowledge P ₃	Weight W
Entrepreneurial potential P ₁	1	3	5	0.62
Entrepreneurial skills P ₂	1/3	1	4	0.28
Entrepreneurial knowledge P ₃	1/5	1/4	1	0.10

TABLE 3 : The judgment matrix and weight of entrepreneurial potential p1

P ₁	P ₁₁	P ₁₂	P ₁₃	P ₁₄	Weight W ₁
Consciousness of motivation P ₁₁	1	3	3	6	0.52
Psychological quality P ₁₂	1/3	1	1	4	0.21
Self-cognition P ₁₃	1/3	1	1	4	0.21
Values P ₁₄	1/6	1/4	1/4	1	0.06

Note: The maximum eigenvalue is 4.075, CI=0.025, RI=0.89, CR=0.028

TABLE 4 : The judgment matrix and weight of entrepreneurial skills p₂

P ₂	P ₂₁	P ₂₂	P ₂₃	P ₂₄	P ₂₅	P ₂₆	Weight W ₂
Innovation ability P ₂₁	1	4	5	5	3	2	0.37
Social skills P ₂₂	1/4	1	2	2	1/2	1/3	0.10
Management ability P ₂₃	1/5	1/2	1	1	1/3	1/4	0.06
Teamwork ability P ₂₄	1/5	1/2	1	1	1/3	1/4	0.06
Resource integration ability P ₂₅	1/3	2	3	4	1	1/2	0.16
Opportunity recognition ability P ₂₆	1/2	3	4	4	2	1	0.25

Note: The maximum eigenvalue is 6.074, CI=0.015, RI=1.26, CR=0.012

TABLE 5 : The judgment matrix and weight of entrepreneurial knowledge p₃

P3	P₃₁	P₃₂	P₃₃	P₃₄	Weight W₃
Basic knowledge of business P ₃₁	1	3	4	2	0.46
Marketing knowledge P ₃₂	1/3	1	2	1/2	0.16
Legal strategy knowledge P ₃₃	1/4	1/2	1	1/3	0.10
Interpersonal etiquette knowledge P ₃₄	1/2	2	3	1	0.28
The maximum eigenvalue is 4.03, CI=0.01, RI=0.89, CR=0.011					

Calculation for the weight of competence model of talents with entrepreneurial skills

According to the judgment and weight of TABLE 2 to 5, establish primary and secondary elements, put the same level of elements through the specification column averaging to calculate the index weight, and then make a one-time inspection, seeing if the accuracy of the weight calculation is fit to the requirement of judgment. Using this method can get all the index of comprehensive evaluation weights. The calculation process is as follows:

The judgment matrix of entrepreneurial ability is:

$$A = \begin{bmatrix} 1 & 3 & 5 \\ \frac{1}{3} & 1 & 4 \\ \frac{1}{5} & \frac{1}{4} & 1 \end{bmatrix} \tag{1}$$

Making the matrix normalized is:

$$\bar{P}_{ij} = \frac{P_{ij}}{\sum_{k=1}^n P_{kj}} (i, j = 1, 2, 3) \tag{2}$$

$$\bar{P}_{ij} = \begin{bmatrix} \frac{15}{23} & \frac{12}{17} & \frac{5}{10} \\ \frac{5}{23} & \frac{4}{17} & \frac{4}{10} \\ \frac{3}{23} & \frac{1}{17} & \frac{1}{10} \end{bmatrix}; \tag{3}$$

After normalization, the judgment matrix adding by the line is:

$$\bar{W}_i = \sum_{j=1}^n \bar{P}_{ij} (i, j = 1, 2, 3); \tag{4}$$

$$\bar{W}_i = [1.8587 \ 0.8527 \ 0.2892]; \tag{5}$$

After taking the vector $\bar{W} = [\bar{W}_1 \ \bar{W}_2 \ \dots \ \bar{W}_n]$ normalized, it can get:

$$\bar{W}_i = \frac{\bar{W}_i}{\sum_{j=1}^n \bar{W}_j} (i = 1, 2, 3); \tag{6}$$

$$W_i = (0.62 \ 0.28 \ 0.10); \tag{7}$$

After calculating, it can get the eigenvalue of matrix:

$$AW = \begin{bmatrix} 1 & 3 & 5 \\ \frac{1}{3} & 1 & 4 \\ \frac{1}{5} & \frac{1}{4} & 1 \end{bmatrix} \begin{bmatrix} 0.62 \\ 0.28 \\ 0.10 \end{bmatrix} = \begin{bmatrix} 1.96 \\ 0.88 \\ 0.29 \end{bmatrix} \tag{8}$$

$$\lambda_{\max} = \frac{1.96}{3 \times 0.62} + \frac{0.88}{3 \times 0.28} + \frac{0.29}{3 \times 0.10} = 3.06 \tag{9}$$

The result after one-time inspection is:

$$CI = \frac{\lambda_{\max} - n}{n - 1} = \frac{3.06 - 3}{3 - 1} = 0.03; \tag{10}$$

RI = 0.58 (refer to the table);

$$CR = \frac{CI}{RI} = \frac{0.03}{0.58} = 0.05 < 0.1; \tag{11}$$

The result of matrix is one time.

Use the same method to calculate the index of the entrepreneurial potential as P₁, entrepreneurial skills as P₂ and entrepreneurial knowledge as P₃, and obtain the index of other three evaluation weights. Combining with all the evaluation index, it can be described as follows TABLE 6:

TABLE 6 : The evaluation index of competence of talents with entrepreneurial skills in colleges and universities

Primary index	Primary weight	Secondary index	Secondary weight	Comprehensive evaluation weight of each factor from solution layer
Entrepreneurial potential P ₁	0.62	Consciousness of motivation P ₁₁	0.52	0.3224
		Psychological quality P ₁₂	0.21	0.1302
		Self-cognition P ₁₃	0.21	0.1302
		Values P ₁₄	0.06	0.0372
		Innovation ability P ₂₁	0.37	0.1036
Entrepreneurial skills P ₂	0.28	Social skills P ₂₂	0.10	0.0280
		Management ability P ₂₃	0.06	0.0168
		Teamwork ability P ₂₄	0.06	0.0168
		Resource integration ability P ₂₅	0.16	0.0448
		Opportunity recognition ability P ₂₆	0.25	0.0700
Entrepreneurial knowledge P ₃	0.10	Basic knowledge of business P ₃₁	0.46	0.0460
		Marketing knowledge P ₃₂	0.16	0.0160
		Legal strategy knowledge P ₃₃	0.10	0.0100
		Interpersonal etiquette knowledge P ₃₄	0.28	0.0280

Modification of competence model of talents with entrepreneurial skills

Modify the competence model of talents with entrepreneurial skills in colleges and universities according to the above evaluation index. It is as shown in Figure5:

The model can visually, accurately and systematically describe the comprehensive direction which the entrepreneurial talents in colleges and universities should base on, and the direction of the universities to cultivate the entrepreneurial talents.

INSPECTION OF THE COMPETENCE MODEL OF TALENTS WITH ENTREPRENEURIAL SKILLS IN COLLEGES AND UNIVERSITIES IN THE PROCESS OF INDUSTRIALIZATION

In order to know whether the modification model of competence of talents with Entrepreneurial Skills is accurate or not, this study will evaluate the entrepreneurial ability of college students through the questionnaire survey method. This

assessment theme is "the comprehensive competence assessment questionnaire of university students' entrepreneurship ability ", which uses the magnitude scale to assess the answer. The evaluation object should base on their own cognition to answer that what kind of competence should have for being a entrepreneurial talent. This assessment gives out 40 questionnaires in which 15 is for the officers of the relevant departments, 15 for the teachers who teach the relevant courses and 10 for the ten students who are random distributed by the entrepreneurship center. 40 copies of questionnaire have been taken back, and the valid ones are 40 copies. TABLE 7 is the competence evaluation score of college students' entrepreneurial ability:



Figure 5 : The modification model of competence of talents with entrepreneurial skills

TABLE 7 : The comprehensive competence evaluation score of college students' entrepreneurship ability

Competence requirements of entrepreneurial ability	Average	Standard number	Score
Consciousness of motivation	4.93	0.258	5
Psychological quality	4.27	0.961	4
Self-cognition	4.14	0.952	4
Values	3.28	0.834	3
Innovation ability	4.10	0.775	4
Social skills	3.13	0.834	3
Economic management ability	3.07	0.799	3
Teamwork ability	3.13	0.834	3
Resource integration ability	3.37	0.884	3
Opportunity recognition ability	3.93	0.594	4
Basic knowledge of business	3.53	0.617	3
Marketing knowledge	3.05	0.617	3
Legal strategy knowledge	3.02	0.632	3
Interpersonal etiquette knowledge	3.27	0.884	3

It can be seen from the statistical results, the modification model of competence of talents with entrepreneurial skills is very close to the competence of what the people think to be an entrepreneurial talent, so the accuracy of the model can be guaranteed.

CONCLUSION

On the basis of combining the competence theory of talents with entrepreneurial skills in colleges and universities, the study establishes a competence model of entrepreneurial talents in colleges. In order to make the model accurately reflect the competences that the entrepreneurial talents must need to have in universities and colleges, this paper uses the method of weight to calculate the competence index of entrepreneurial talents in universities, and revises the original model according to the calculation result. By the examples, it can be known that the revised model can more accurately describe the competences that the entrepreneurial talents should have in colleges and universities. The revised model proposed by this study can be the direction of cultivating the entrepreneurial talents in colleges and universities. As long as the universities employ various teaching methods to make the talents meet the requirements of the competence model of entrepreneurial talents in colleges, it can make the college talents possess the ability of entrepreneurship.

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