

Research on Comprehensive Ability Model of College Students' Entrepreneurship Based on SEM

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Abstract—This paper identifies that the college students' entrepreneurial comprehensive ability includes 9 latent variables. By collecting data through questionnaires, using spass statistical analysis tools and SEM method, the structural model of influencing factors of college students' comprehensive entrepreneurial ability is constructed. To improve the comprehensive ability of college students' entrepreneurship, we should grasp the key factor: the knowledge quality. It is necessary to accurately locate the key factors and other factors, systematize and clarify the causal relationship between different factors.

Keywords—College students' entrepreneurship; Comprehensive ability; Influencing factors; Path analysis; Structural equation model

I. RESEARCH VARIABLES

The influencing factors of College Students' comprehensive entrepreneurial ability involve many aspects, it is very important to systematically and scientifically design the measurement index of College Students' entrepreneurship comprehensive ability that meets the requirements [1]. And it is also very important to analyze the mechanism of influencing factors of comprehensive ability. On the basis of consulting relevant experts' opinions and analysis, comparing and screening for many times, this study constructs indicators by combining documents and relevant research results of ministries and commissions [2].

II. ENTREPRENEURIAL CONSCIOUSNESS

The factors influencing the comprehensive ability of college students' entrepreneurship involve many aspects [3]. The systematic scientific design meets the requirements of the college students' comprehensive ability measurement indicators is very important [4]. It is very important to analyze the mechanism of the comprehensive ability influencing factors.

A. Entrepreneurial Awareness

Entrepreneurial awareness refers to the individual psychological tendency that plays a driving role in people's entrepreneurial practice activities, and is the basis for the comprehensive ability of college students' entrepreneurship.

Research on Management Mode of College Students' Entrepreneurship Guidance Course in Universities of Science and Engineering. Research on the Ideological and Political Management Model of University Courses in Science and Engineering. Research on the Ways of Transforming the Innovative Ability of University Students in Science and Engineering Based on SEM-FSEM

B. Entrepreneurship

Entrepreneurship is the spiritual quality that helps the entrepreneurs to succeed in their entrepreneurship, which will have an indirect impact on the comprehensive ability of entrepreneurship through the ability quality.

C. Knowledge Quality

Knowledge quality means that entrepreneurs can familiarize themselves with and apply legal knowledge and master the relevant professional knowledge of enterprise management. The indicators are market economy theory and knowledge, basic knowledge of entrepreneurship, legal knowledge, management knowledge. Knowledge quality has an indirect influence on the comprehensive ability of entrepreneurship through ability quality [5].

D. Psychological Quality

Entrepreneurs should be confident, be good at controlling their emotions, be brave in taking risks and taking responsibilities, and be able to face challenges with a positive attitude [6]. This index mainly includes three aspects: self-confidence, self-control and willpower.

E. Ability and Quality

Entrepreneurial ability is the essential quality of successful entrepreneurship, and it is the most obvious part of the comprehensive ability of entrepreneurship. In the survey of college students' comprehensive entrepreneurship ability, the indicators of college students' entrepreneurship ability are: psychological quality, communication ability, judgment and decision-making ability and business operation ability [7]. Entrepreneurship ability is the core of college students' comprehensive ability of entrepreneurship, so it will have a direct impact on the comprehensive ability of entrepreneurship. In addition, competence quality will help to improve environmental adaptability, so it also has a direct impact on the comprehensive ability of entrepreneurship.

F. Entrepreneurial Quality

The quality of entrepreneurship is the relatively stable psychological quality in the comprehensive ability of entrepreneurship and is the guarantee of the comprehensive ability of entrepreneurship for college students [8]. In the

survey of College Students' comprehensive entrepreneurial ability, it can be divided into three indicators to measure: perseverance, honesty and trustworthiness, win-win cooperation. The entrepreneurship quality mainly refers to the inheritance and long-term formation of the psychological quality of entrepreneurship. The quality of entrepreneurship plays a key role in the success of entrepreneurship and it has a positive impact on the comprehensive ability of entrepreneurship.

G. Comprehensive Quality of Entrepreneurship

The comprehensive quality of entrepreneurship is a combination of the comprehensive quality of the entrepreneurs themselves and the external environment [9]. In the survey of the comprehensive quality of college students' entrepreneurship, the indicators to measure the comprehensive quality of College Students' entrepreneurship are set as: their own conditions, the influence of external environment on them, the organic combination of their own conditions and external environment.

H. Adaptability

Environmental adaptability refers to the ability to grasp the opportunity of entrepreneurship and create more favorable conditions for entrepreneurship, which is a positive adaptability. In the survey of college students' comprehensive entrepreneurial ability, the indicators of entrepreneurial environment adaptability are set as follows: learning to implement policies, integrating resources, grasping business opportunities and obtaining fund [10]. The adaptability of entrepreneurial environment has a positive impact on the comprehensive ability of entrepreneurship.

I. Analytical and Summary Ability

The ability to analyze and summarize contributes to the continuous success of entrepreneurship. In the survey of College Students' comprehensive ability of entrepreneurship, the indicators to measure college students' comprehensive ability of entrepreneurship are set as follows: survey summary, reflection and improvement. Therefore, it is found that summary and analysis in the process of entrepreneurship have a great direct impact on the improvement of the comprehensive ability of entrepreneurship. Based on this, the analysis and summary ability has a positive impact on the comprehensive ability of entrepreneurship.

III. RESEARCH HYPOTHESIS AND THEORETICAL MODEL

According to the theoretical knowledge of structural equation model, exogenous potential variables are independent variables. This paper considers these six factors that affect college students' comprehensive entrepreneurial ability: entrepreneurial consciousness, entrepreneurial spirit, knowledge quality, psychological quality, entrepreneurial quality and analytical and summary ability as exogenous latent variables. Endogenous potential variables are dependent variables, this paper considers three indicators: ability quality, environmental adaptability and comprehensive entrepreneurial

quality as endogenous variables. That is, exogenous potential variables have an impact on endogenous potential variables.

A. Research Hypothesis

Based on the above analysis results, the following theoretical assumptions are put forward to verify the theoretical model.

H1: Entrepreneurship consciousness has a positive impact on entrepreneurship.

H2: Entrepreneurship has a positive effect on psychological quality

H3: The quality of entrepreneurship has a positive impact on the comprehensive quality of entrepreneurship.

H4: Entrepreneurship quality has a positive impact on environmental adaptability

H5: Ability quality has a positive impact on the comprehensive quality of entrepreneurship

H6: The ability of analysis and summary has a positive impact on the comprehensive quality of entrepreneurship

H7: Knowledge quality has a positive impact on entrepreneurship quality.

H8: Knowledge quality has a positive impact on the comprehensive quality of entrepreneurship.

B. Theoretical Model

Based on the above assumptions, this paper constructs the initial model as shown in Fig.1.

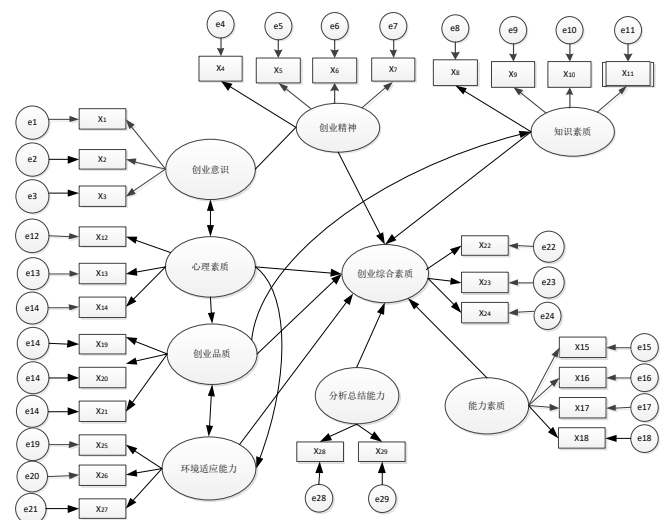


Fig. 1. Initial Structural Model of Influencing Factors of College Students' Comprehensive Entrepreneurship Ability

IV. EMPIRICAL ANALYSIS

A. Questionnaire Design and Research Samples

1) Questionnaire design

On the basis of the original questionnaire, this paper redesigned the questionnaire on the comprehensive quality of college students' entrepreneurship, and used Likert five-point scale to measure the variables of each question, which was divided into three parts: questionnaire instruction, personal situation and questions of the respondents. After completing the preliminary design of the questionnaire, the revision opinions and suggestions of some university research experts in Anhui Province were solicited.

According to the investigation and comparative analysis of the comprehensive quality of college students' entrepreneurship, the factors influencing the comprehensive quality of college students' entrepreneurship are considered from the aspects of the ability quality, entrepreneurship quality, entrepreneurship comprehensive quality, environmental adaptability and analysis and summary ability. There are mainly 29 secondary indicators. The actual variables are obtained by using the questionnaire "Comprehensive Quality of College Students' Entrepreneurship" designed and used in this paper, while the qualitative data are expressed by grade criteria.

There are 9 groups and 29 items in the questionnaire, which are 9 evaluation indicators, such as comprehensive quality of entrepreneurship, environmental adaptability and analysis and summary ability. Among them, there are 3 questions reflecting entrepreneurship consciousness, 4 questions reflecting entrepreneurship spirit, 4 questions reflecting knowledge quality, 3 questions reflecting psychological quality, 4 questions reflecting ability quality, 3 questions reflecting entrepreneurship quality and 3 questions reflecting comprehensive quality of entrepreneurship.

2) Samples of research

In this paper, 1000 questionnaires were distributed to students in Anhui University of Science and Technology and other universities, among them, 968 valid questionnaires were valid. The standard deviation of SPSS software basically fluctuates around 1.0, and the average value fluctuates around 3.5, these data are stable.

B. Reliability and Validity of Questionnaires

The reliability test is shown in Table I and the validity test is shown in Table II. In general, Cronbach's Alpha > 0.7 and CITC > 0.5 are required to be effective.

TABLE I. QUESTIONNAIRE CIT VALUE AND CRONBACH'S ALPHA TEST

Risk factor	Cronbach's Alpha	CITC
Career Consciousness	0.801	0.531
Enterprising spirit	0.713	0.523
Knowledge quality	0.707	0.512
Psychological quality	0.710	0.507
Capability and quality	0.743	0.510
Entrepreneurial quality.	0.742	0.506
Comprehensive quality of entrepreneurship.	0.729	0.513
Environmental adaptability.	0.704	0.517
Ability to analyze and summarize.	0.547	0.507
Totality	0.907	0.514

Table I shows that the overall Cronbach's value is 0.907, the individual Cronbach's Alpha is greater than 0.7, and the CITC is greater than 0.5, so each individual factor is effective.

TABLE II. KMO AND BARTLETT TEST

Kaiser-Meyer-Olkin Measure		0.843
Bartlett Sphericity test	The approximate chi-square	1173.602
	df	91
	Sig.	0.000

Table II shows that $KMO = 0.843 > 0.5$ (reference standard), the closer the value is to 1, the better the effect of factor analysis is, so the above data are more suitable for factor analysis. At the same time, the F value of Bartlett sphericity test is 0.000, which shows that the index data of influencing factors of college students' comprehensive quality of entrepreneurship are normally distributed, which meets the requirement of SEM for data analysis. Therefore, the reliability and validity of the questionnaire are up to the standard.

C. Constructing Initial Model and Correcting

1) Constructing Initial Model and Testing

Because the length of the article is valid, the initial model diagram is not presented here. After the initial estimation of the parameters of the initial model, the fitting effect of the model needs to be evaluated. If the model fitting index meets the standard requirement, then the model results can be analyzed. The results are shown in Table III.

TABLE III. SIMULATED COMPOSITE INDEX CALCULATION RESULTS

Test item	Simplicity fitness index		Absolute fitness index				Value-added fitness index.		
	PNFI	PGFI	χ^2	GFI	RMR	RMSEA	NFI	IFI	CFI
Reference value	>0.5	>0.5	$P < 0.05$	>0.9	<0.08	<0.08	>0.9	>0.9	>0.9
Actual value	0.531	0.517	$p = 0.02$	0.907	0.074	0.061	0.913	0.902	0.872
Model matching.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No

a.

Note: The evaluation criteria of fitting degree: the smaller RMR and RMSEA, the better; The closer GFI, NFI, IFI and CFI are to 1, the better.

The above table shows that all the evaluation indicators except CFI are up to the standard, which shows that the overall fitness of the model is good. When the CFI value is greater

than 0.9, it means that the model is acceptable. $CFI = 0.872$ in this model shows that further optimization of the model is needed according to the modification proposals.

2) Constructing Initial Model Revision

This paper use AMOS software to revise the model paths repeatedly, the results are shown in tables IV, V and VI.

TABLE IV. VALIDATION OF THE INITIAL STRUCTURAL EQUATION MODEL

Relationships between variable s.	Estimated value Estimate	Error S.E.	C.R	P
Enterprising spirit ←Career Consciousness	0.609	0.029	2.003	0.018
Psychological quality ←Enterprising spirit	0.734	0.031	2.134	0.013
Comprehensive quality of entrepreneurship. ←Entrepreneurial quality.	0.519	0.042	2.031	0.003
Environmental adaptability. ←Entrepreneurial quality	0.605	0.030	1.972	0.019
Comprehensive quality of entrepreneurship←Capability and quality	0.704	0.050	2.106	0.021
Comprehensive quality of entrepreneurship←Ability to analyze and summarize.	0.540	0.035	1.971	0.009
Comprehensive quality of entrepreneurship←Environmental adaptability.	0.237	0.014	1.983	0.015
Comprehensive quality of entrepreneurship←Knowledge quality	0.537	0.042	2.053	0.000
Knowledge quality ←Entrepreneurial quality.	0.861	0.061	2.131	0.010

According to the validation analysis of each path in Table IV, the initial model is modified. The table above shows that in the eight causality assumptions, the critical value C.R of all path parameters is greater than the reference value 1.96, and the significance level is smaller than 0.05, which shows that the model has a good fitting degree and basically meets the requirements of the significance level. In order to further improve the scientificity and practicability of the model, the initial model is further revised according to the revision suggestions of tables V and VI given by AMOS software.

TABLE V. SUGGESTIONS FOR COVARIANCE MODIFICATION OF THE INITIAL MODEL

Relationships between variables	M.I.	Par Change
Psychological quality ↔ Career Consciousness	6.282	0.506
Enterprising spirit ↔ Career Consciousness	5.215	0.346
Knowledge quality ↔ Enterprising spirit	5.425	0.229
Entrepreneurial quality. ↔ Psychological quality	6.21	0.406

The M.I. value in Table V shows that if we add another path between the two variables of entrepreneurship awareness and psychological quality, the chi-square value of 6.282 will be reduced. Similarly, there are also interrelated paths between entrepreneurship and entrepreneurship consciousness, knowledge quality and entrepreneurship spirit, entrepreneurship quality and psychological quality.

TABLE VI. THE MODIFIED STANDARD DEVIATION REGRESSION COEFFICIENT OF THE INITIAL MODEL IS SUGGESTED

Relationships between variables	M.I.	Par Change
Environmental adaptability. ←Career Consciousness	7.289	0.455
Environmental adaptability. ←Knowledge quality	6.342	0.407

The M.I. value in Table VI shows that if a causal path is added between the two variables of entrepreneurial awareness and environmental adaptability, the chi-square value of 7.289 will be reduced. Similarly, there is a causal relationship between knowledge quality and environmental adaptability.

3) Building the Final Model

According to the model modification suggestions, this paper revised repeatedly until the parameters of the model meet the requirements of the reference standard. The final structural equation model is shown in Fig. 2.

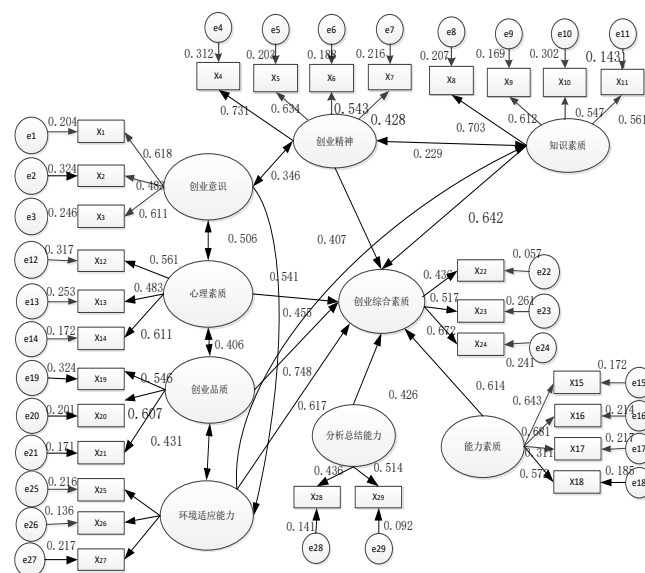


Fig. 2. The Final Structural Model of the Factors Affecting the Comprehensive Quality of College Students' Entrepreneurship

V. CONCLUSION AND ANALYSIS

Hypothesis H1 analysis: The above analysis shows that entrepreneurial awareness has a positive impact on entrepreneurship. Therefore, the entrepreneurial desire, courage and the positive impact of social responsibility on the ability and quality of college entrepreneurs pass the test and can create a good entrepreneurial atmosphere and stimulate the ability and quality of entrepreneurs.

Hypothesis H2 analysis: The above analysis shows that entrepreneurship has a positive impact on competence quality. Therefore, entrepreneurship has a positive impact on the ability and quality of entrepreneurs, good team spirit, hard-working spirit, dedication and innovation spirit are conducive to improving the ability and quality of college entrepreneurs.

Hypothesis H3 analysis: Through the above analysis, it shows that knowledge quality will have a positive impact on ability quality. Therefore, the management knowledge, legal knowledge, basic knowledge of entrepreneurship, market economy theory and knowledge on college students' entrepreneurs passed the test, good management knowledge, legal knowledge, entrepreneurship knowledge and market knowledge are conducive to improving the ability and quality of college students' entrepreneurs.

Hypothesis H4 analysis: Through the above analysis, psychological quality will have a positive impact on ability quality. Therefore, self-confidence, self-control and willpower are conducive to improving the ability and quality of college students' entrepreneurs.

Hypothesis H5 analysis: Through the above analysis, it shows that the ability quality will have a positive impact on environmental adaptability. Therefore, the positive influence of psychological quality, communication ability, judgment and decision-making ability and business ability on college students' entrepreneurs is supported. Strengthening psychological quality, communication ability, judgment and decision-making ability and business ability is conducive to improving the ability and quality of college students' entrepreneurs.

Hypothesis H6 analysis: Through the above analysis, it shows that competence quality, environmental adaptability, entrepreneurial quality and analytical summary ability will have a positive impact on the overall quality of entrepreneurship. Therefore, strengthening the self-ability, environmental adaptability, entrepreneurship quality and analysis and summary ability of College entrepreneurs is conducive to improving the ability quality of college students' entrepreneurs.

Hypothesis H7 analysis: The above analysis shows that there is a significant correlation between entrepreneurship and psychological quality. Therefore, the positive influence of entrepreneurial desire, courage and social responsibility on self-confidence, self-control and willpower is supported. Strengthening the entrepreneurial desire, courage and social responsibility of college entrepreneurs get conducive to improving the ability and quality of college students' entrepreneurs.

Hypothesis H8 analysis: Through the above analysis, it shows that there is a significant correlation between knowledge quality and psychological quality. Therefore, the positive influence of the market economic theory and knowledge, basic knowledge of entrepreneurship, legal knowledge and management knowledge of college entrepreneurs on self-confidence, self-control and willpower get supported, strengthening market economic theory and knowledge, basic knowledge of entrepreneurship, legal knowledge and management knowledge of college entrepreneurs is conducive to improving the ability and quality of college students' entrepreneurs.

This paper carefully analyzed the indicators of the comprehensive quality evaluation of college students' entrepreneurship, and on this basis, it applied structural

equation model to test the theoretical hypothesis model. In the process of empirical research, the relationship between evaluation indicators and the way of their impact can be more intuitively presented for us. According to the comparison of the impact degree of each evaluation index on the comprehensive quality of college students' entrepreneurship, we can know that the direct impact coefficient of entrepreneurship quality on the comprehensive quality of entrepreneurship is 0.748, which is more obvious than other factors.

To improve the comprehensive ability of college students' entrepreneurship, we should grasp the key factor: the knowledge quality, we should adopt various means such as classroom education, social practice and some other methods to improve the quality of college students' entrepreneurship knowledge. However, it is not obvious or even ineffective for improving the comprehensive quality of college students' entrepreneurship by unilaterally improving the level of knowledge quality factors. Therefore, it is necessary to accurately locate the key factors and other factors, systematize and clarify the causal relationship between different factors, and improve the overall arrangement so that it can effectively enhance the comprehensive entrepreneurial ability of college students.

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