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Original Paper

Study on Academic Growth and Ability Training of Students in Private Colleges and Universities with Engineering Cost Major as an Example

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Abstract

In order to adapt to the actual demand for talents under the new era, new normal and new industrial background, and change the status quo of traditional engineering cost major in private colleges and universities, such as light practice and weak innovation consciousness. Through literature research, this paper obtains the ability cultivation model of engineering cost major students, including ideological and moral quality, ability to acquire knowledge, and ability to adapt to society. The questionnaire survey method and SPSS software are used to analyze the model. The analysis shows that students pay more attention to physical and mental health, practical ability, professional knowledge, learning ability, unity and cooperation, communication ability, adaptability and adaptability in the model. Finally, the article also puts forward some suggestions on the cultivation of some abilities, hoping to provide some suggestions for the reform of talent training objectives and programs in private colleges and universities, so as to improve the abilities of students majoring in engineering cost.

Keywords

private university, ability cultivation, academic guidance system, engineering cost major

1. Introduction

In recent years, the frequent outbreak of psychological events among college students and the "employment problem" reflected in the domestic talent demand market and graduates have forced major colleges and universities to reflect on whether the current training model can meet the current market demand. The cultivation of comprehensive quality, the development of students' personality, the consciousness of students' main body and the model of students' evaluation have been paid more

attention by the leaders of colleges and universities. Under the background of "double first-class", with the deepening of the reform of the education system, majors related to architecture and civil engineering have gradually become important majors in major colleges and universities. On the basis of training students to learn theoretical knowledge, they can strengthen their practical ability and enhance their emotional value. The background of "The Belt and Road" and the lack of domestic demand in China's high-speed rail construction in infrastructure, and the inevitable trend of going out and other social backgrounds provide the direction for the training of relevant professionals. As a private university to train the national innovation and application of talents, the engineering cost professional talent training put forward higher requirements.

In order to make students become talented, grow and develop comprehensively, so that students can better connect with the future work, Summarizing the current research on college students' ability and quality, combining with the training objectives of students majoring in engineering cost, this paper establishes a model of ability and quality training, which reflects various abilities that students of this major should have from three dimensions, namely, ideological and moral quality, ability to acquire knowledge and ability to adapt to society. Secondly, through the questionnaire and statistical analysis, the ability quality model is verified, and the ability that the engineering cost major students in private universities value more in the four years in school is obtained. Finally, based on the model construction and current situation investigation system, the paper summarizes and refines the feasible countermeasures and suggestions for colleges and universities to cultivate and improve students' ability and quality.

2. Ability Cultivation Model

Ability is a person to solve the problem embodied in the comprehensive quality, according to the ideological quality, professional knowledge, mental health and other conditions vary. David McClelland proposed the iceberg model based on the fact that abilities and qualities differ in different people. He classifies competency into five categories: knowledge, skills, self-concept, traits, and motivation. Hu Yonghong put forward five principles to be followed in constructing the evaluation index system of college students' comprehensive quality, which are comprehensive principle, independent principle, hierarchical principle and representative principle. Based on the analysis of many literatures, this paper establishes the ability and quality training model for students majoring in engineering cost in private universities.

2.1 Literature Analysis

College student cadres are a group that cannot be ignored among college students. Gao Yuanjie pointed out that the main contents of college student cadres' ability training include seven aspects, namely, training demonstration and driving ability, training comprehensive learning ability, training organization and coordination ability, training expression and communication ability, training unity and cooperation ability, training effective execution ability and training adaptability and innovation ability.

Jiao Long put forward the ability model suitable for evaluating college student cadres: Knowledge, skills (ability to work, ability to collaborate, ability to find and solve problems, ability to control self-control, ability to communicate, ability to design plans), self-concept (ideological and political quality, mental health quality, self-education ability), characteristics (leadership, innovation ability), motivation (sense of responsibility, interpersonal relationship, enthusiasm for work). Zheng Ying proposed the model of undergraduate competence as physical and mental quality (physical health, mental health), moral quality (humanistic quality, moral personality), scientific quality (professional achievement, learning ability, interdisciplinary knowledge) and professional quality (adaptability, self-control, teamwork, interpersonal communication, independent thinking and leadership). Ni Shengqiao believes that the innovation and entrepreneurship ability of contemporary college students is very important, so guiding students to carry out "mass innovation" practice during school and training students to become innovative comprehensive talents is also an important part of college talent training. Based on Analytic Hierarchy Process (AHP), Yuan Guojun established a core competence evaluation model for applied undergraduate universities: Ideological and moral (moral cultivation, polite etiquette, integrity and profound), dedication (dedication, responsibility, initiative, professionalism), cooperation (communication skills, teamwork, self-management), innovation (ability to work under pressure, ability to find problems, ability to learn, adaptability). Zhang Guofeng et al., believe that application-oriented innovative talents are a main type of talents cultivated by application-oriented universities and higher vocational colleges, and build a talent application innovation ability model from professional knowledge, professional skills, professional cognition, personal quality, innovation consciousness and thinking quality.

Yang believes that American colleges and universities pay special attention to communication, employment, and innovation skills, while Chinese colleges and universities in communication skills training slightly lack, employability and employer demand gap. Zhao Shuang believes that it is very important for students majoring in engineering cost to inspire innovative thinking, cultivate engineering practice ability, and improve innovation ability and professional quality. Wang Xiao believes that the ability of students majoring in engineering cost should be improved from the aspects of vocational ability, learning ability and innovation ability. Han Lihong believes that the cultivation of practical ability of students majoring in cost is very important, and puts forward the relevant means to improve the ability.

2.2 Model Construction

Construct a model suitable for evaluating the ability and quality of college students. Through literature research, based on David McClelland's "Iceberg" model, combined with employers' expectations of graduates, re-integrated elements, the evaluation criteria of ideological and moral quality, the ability to acquire knowledge, and the ability to adapt to society are obtained. The specific evaluation model is shown in the Figure 1.

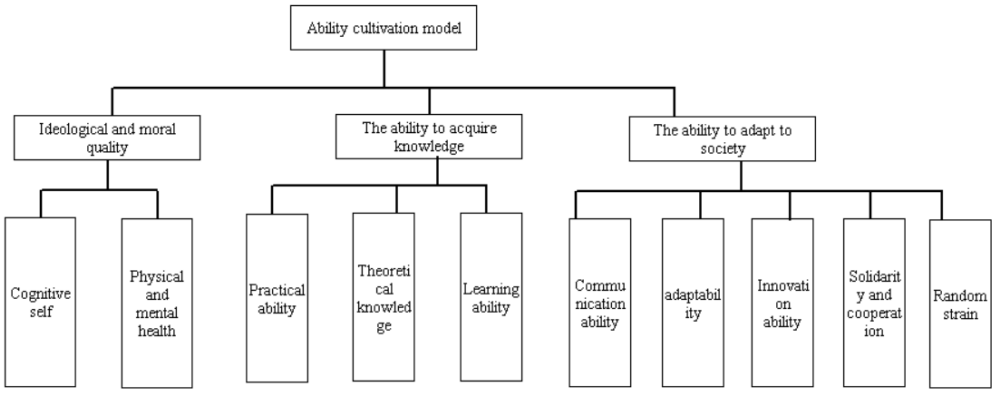

Figure 1. Engineering Cost Major Students Ability Quality Training Model

3. Model Analysis

According to the quality training model constructed in this paper, the corresponding questionnaire is designed. SPSS software was used to test the reliability and validity of the questionnaire data and factor analysis, and various abilities of the model students were obtained.

3.1 Questionnaire Design

Morality, intelligence, physical beauty and labor are the basic criteria for the orientation of human quality, and also the trend goal of human social education, so the education of human society cannot be separated from this fundamental. The questionnaire mainly includes four parts, namely, personal information, ideological and moral education (moral education direction), intellectual education direction and physical education direction. The specific contents of each part are as follows:

Personal information includes grade, student origin, gender, and student cadre; The direction of moral education includes cognitive self, physical and mental health; The direction of intellectual education includes practical ability, theoretical knowledge, learning ability; Comprehensive literacy includes communication ability, adaptability, innovation ability, solidarity and cooperation, random strain.

3.2 Questionnaire Distribution

The object of this questionnaire is the students of Hope College of Southwest Jiaotong University, which is a full-time ordinary undergraduate private college of engineering. The training goal of Engineering cost major is that students are mainly engaged in construction project economic prediction and evaluation, construction cost determination and control, and other contents of cost management after graduation. This major is an organic integration of engineering technology, economic science and digital information technology, and its biggest feature is composite. Therefore, it is hoped that students can learn knowledge fields including engineering technology, economics, law, management and digital information technology, promote the integration of engineering technology science, modern management science methods and digital information technology tools, improve students' cognitive level, and students can effectively cope with the complex and changeable environment of future economy and society. For students in a wider field of knowledge to find more suitable for their own

track, to highlight the value and significance of individual life.

The questionnaire distribution scope: 100 questionnaires were distributed from freshmen to seniors, including not only undergraduate majors, but also students who were promoted to higher education. In the end, 82 valid questionnaires were collected in freshmen, 91 valid questionnaires were collected in sophomore, 86 valid questionnaires were collected in junior, and 90 valid questionnaires were collected in senior, for a total of 349 questionnaires.

3.3 Data Analysis

3.3.1 Analysis of Descriptive Indicators

SPSS software was used to conduct a descriptive statistical analysis of the data related to the basic personal information in the valid questionnaire recovered from the research. The results are shown in Table 1.

Table 1. Descriptive Statistical Analysis Table of Basic Personal Information of College Students

Feature statistical variables	Category	Sample size	percent
Sex	Male	189	54.15%
	Female	160	45.85%
Grade distribution	Freshman year	82	23.50%
	Sophomore year	91	26.07%
	Junior year	86	24.64%
	Senior year	90	25.67%
Student cadre	Yes	70	20.1%
	No	279	79.9%
Source of students	Village	159	45.6%
	Towns	190	54.4%

3.3.2 Reliability and Validity Analysis

This study adopts the questionnaire survey method to study the competency model of engineering cost major students. The quality of the questionnaire design content determines the authenticity and applicability of the research results, so it is necessary to ensure that the questionnaire has a high effectiveness. In order to test the validity of the questionnaire, the reliability and validity of the questionnaire were analyzed. In the field of social science, the total reliability coefficient of the questionnaire is above 0.7, which is called good reliability. If the reliability coefficient of the questionnaire is between 0.6 and 0.7, the questionnaire is acceptable. If it is below 0.6, the questionnaire must be modified. The reliability analysis results of the questionnaire are shown in the figure 2 below. Alpha value is greater than 0.7, indicating that the questionnaire has high reliability.

可靠性统计

克隆巴赫 Alpha	项数
.855	10

Figure 2. Reliability Analysis Results of the Questionnaire

In this study, factor analysis will be used for validity analysis. Before factor analysis, KMO and Bartlett is Test of Sphericity to determine whether the questionnaire is suitable for factor analysis. The test is used to detect the partial correlation between variables. When the statistic is above 0.7, the effect of factor analysis is better; when the statistic is below 0.5, the effect of factor analysis is poor. The software was used to conduct sphericity test on the total questionnaire, and the data obtained were shown in Figure 3.

KMO 和巴特利特检验

KMO 取样适切性量数。		.834
巴特利特球形度检验	近似卡方	314.823
	自由度	45
	显著性	.000

Figure 3. Validity Analysis Results of the Questionnaire

As can be seen from the figure above, the test value of the total questionnaire is 0.834, greater than 0.7, and the significance level of Bartlett's sphericity test is 0, indicating that there is a correlation between the variables, thus proving that this questionnaire is suitable for factor analysis.

3.3.3 Factor Analysis

The gravel diagram of this data obtained by SPSS software is shown in Figure 4.

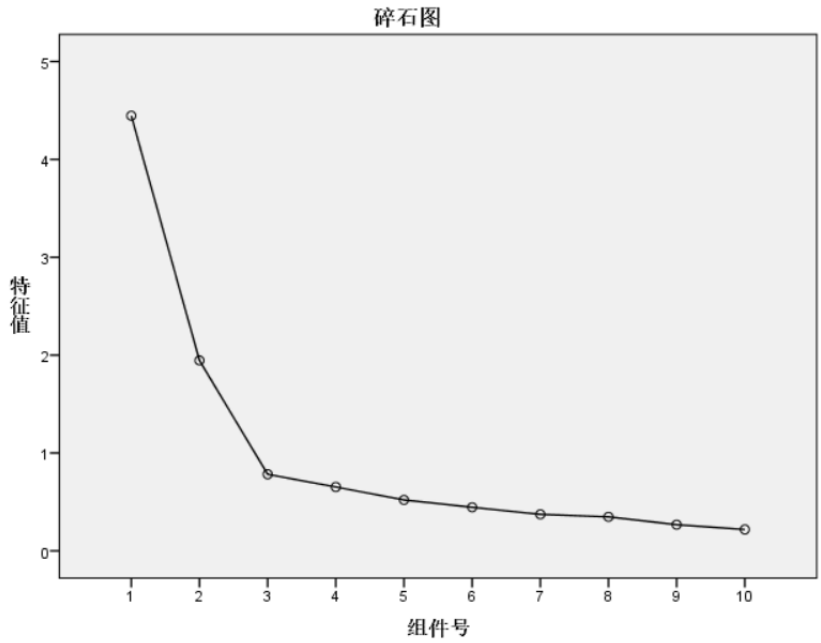

Figure 4. Lithotripsy

The lithotripsy map shows that the first characteristic value changes significantly, and the change slows down after the second characteristic value, so the first two common factors are extracted here. Here, the variance maximum method in orthogonal rotation is used to carry out the factor rotation axis, and the results are shown in Table 2:

Table 2. Component Matrix

	Ingredient	
	1	2
Cognitive self	0.517	0.455
Physical and mental health	0.789	-0.673
Practical ability	0.749	-0.23
Theoretical knowledge	0.702	0.29
Learning ability	0.651	-0.579
Communication ability	0.502	0.696
Adaptability	0.414	0.647
Innovation ability	0.439	0.212
Solidarity and cooperation	0.708	0.204
Random strain	0.347	0.649

成分	初始特征值			提取载荷平方和		
	总计	方差百分比	累积 %	总计	方差百分比	累积 %
1	4.446	44.458	44.458	4.446	44.458	44.458
2	1.946	19.457	63.915	1.946	19.457	63.915
3	.783	7.827	71.742			
4	.653	6.527	78.268			
5	.521	5.206	83.474			
6	.445	4.453	87.927			
7	.373	3.732	91.660			
8	.348	3.475	95.135			
9	.268	2.678	97.813			
10	.219	2.187	100.000			

提取方法：主成分分析法。

Figure 5. Total Variance Interpretation

It can be seen from the above table that the ability qualities that have a greater impact on the first factor include physical and mental health, practical ability, professional knowledge, learning ability, solidarity and cooperation, etc., while the ability qualities that have a greater impact on the second factor include communication ability, adaptability and adaptability, etc. The cumulative contribution rate of these two factors is 63.915%.

Therefore, this paper summarizes the first factor as scientific literacy, and the second factor as professional literacy. From this, it can be seen that for students majoring in engineering cost, they attach importance to the learning of professional knowledge, the improvement of learning ability and the improvement of practical ability at school. I hope to cultivate my communication skills, adapt to the society, and adapt to various environments and problems at random. I hope I can adapt to the job faster in the future work.

4. Ability Training Countermeasures

College graduates are not very strong and capable in adapting to social consciousness. The psychological ability to withstand the pressure brought by setbacks, difficulties and unexpected events encountered in real life is generally weak. In recent years, with the continuous expansion of the scale of college enrollment and education and the increasingly fierce social competition, especially under the impact of a new round of economic crisis, the pressure of college students' study, employment, emotional needs and economic conditions is increasing, and the psychological problems of college students are becoming more and more prominent. Various psychological and behavioral problems caused by psychological disorders of college students are increasing day by day. At present, in the practice of quality education in colleges and universities, students do have greater freedom to conduct independent research and study, but at the same time there are some problems, For example, the school has neglected to strengthen the education on the physical and psychological quality of graduate

students, and some students have problems in their physical and psychological quality, which the school has not found in time and has not been well prevented, and even led to the phenomenon of suicide in some students' psychological collapse.

Although many colleges and universities have set up psychological counseling posts, but in fact, there are few students who can take the initiative to consult, so it is suggested that psychological counseling can be carried into the classroom of students, and related psychological lectures and activities, so the school needs to strengthen the construction of mental health education team, and strive to build a professional and professional team of experts.

For practical ability, engineering cost major students are also very important. However, many colleges and universities in our country attach more importance to the teaching of theoretical knowledge, especially for application-oriented private colleges and universities, they should pay more attention to students' professional practice ability. Therefore, in teaching, teachers should change the current teaching mode of "full classroom irrigation" and encourage students to discuss more and ask more questions. Teacher's education and teaching are not only lectures and homework correction, the most important thing is how to tap students' potential and cultivate students' ability to expand. In addition to graduation practice, teachers should also guide students to actively explore and practice in corresponding professional courses. Secondly, schools should keep close contact with enterprises and arrange students to visit and study regularly. Real cases in enterprises can also be used in teaching for students to practice.

With the development of The Times, the cultivation of innovation ability has become more and more important. Students' innovation ability has become the focus of colleges and universities in recent years, and it is also the focus of students majoring in engineering cost. In class, teachers can adopt guided education to cultivate students' divergent thinking. For some text-based courses, the exam may take the form of an essay, in which students are free to express their own opinions on an argument. There is no single answer in the exam, so students' ability to think independently can be improved in this way. Various scientific research and teaching resources of the school should be centrally open to students, and actively create a platform for opening, sharing and exchange through high-level scholars' visits and lectures, so as to continuously cultivate the cultivation potential of students.

5. Conclusion

This paper studies and analyzes the ability and quality of college students in China through the literature research method, combines the requirements of engineering cost industry for talents, and establishes the ability and quality training model of engineering cost major students. In combination with the form of questionnaire survey, a questionnaire survey was conducted on students majoring in engineering cost in Hope College of Southwest Jiaotong University, and SPSS software was used for factor analysis to obtain the ability of students majoring in this major, so as to verify the competency model and provide suggestions for the training plans and objectives of students majoring in this major

in private colleges and universities.

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