Research on the Current Situation of General Education in Private Colleges and Universities

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Abstract: Firstly, this paper reviews the development history and current situation of general education. Then, taking private universities as the research object, the author designed and issued a questionnaire. By analyzing the data through variance analysis and regression analysis, it is concluded that there are differences in the satisfaction of college students of different genders and majors to general education. Through the analysis, four main factors affecting the satisfaction of general education are identified: Teachers, Rationality of content, Standardization of school management, Types of general education. Finally, a three-layer BP neural network was constructed with four influencing factors as the input layer neurons and general education satisfaction as the output layer neurons. By using the data training model, the model reached a high accuracy.

Keywords: general education; private colleges and universities; influencing factor

1 INTRODUCTION

With the rapid development of China's economy and the change of social environment, general education has become a hot topic in today's higher education. As a kind of generalist education, general education is to cultivate all-round developed talents, thus making up for the shortcomings of professional education in current colleges and universities. Therefore, exploring the current situation of general education is the top priority of higher education. In 1829, Professor A.S. Parkard of Bowdoin College was the first to put forward the combination of general education and higher education. He stressed that general education is an education in which students need to understand comprehensive and complete knowledge before learning professional knowledge[1]. In the 21st century, the Association of American Colleges and Universities includes general education in liberal education. They emphasize that general courses can cultivate students' sense of responsibility and their ability to solve practical problems[2]. In 1978, Harvard University implemented a general education program called "core curriculum" for undergraduates. Then in 2007, Harvard University promulgated the *Reform Plan of General Education of Harvard University*[3]. In the *Report of the Work Group on General Education* in the same year, the "core curriculum" was changed to "general education plan", emphasizing the concept of general education in practical study and life[4]. In 2011, most universities in Japan carried out reforms on general education, such as the University of Tokyo, Kyoto University and Osaka University. After the reform, these universities pay more attention to students' extensive knowledge in general education[5].

As for Chinese scholars, they have different views on the concept of general education. During the period of the Republic of China, Cai Yuanpei, who was influenced by western culture, put forward the school running principle of "ideological freedom and inclusiveness" when he was the president of Peking University, with a certain idea of general education[6]. Li Manli discussed the concept of general education and finally summarized the meaning of general education from three aspects. From the nature, general education is an integral part of higher education and a non professional education that college students should accept; from the purpose, general education is to cultivate all-round developed social man and national citizens who actively participate in social life, with a sense of social responsibility; From the content, general education is a kind of extensive, nonprofessional and non utilitarian education of basic knowledge, skills and emotions[7]. Li Sen believes that general education is to cultivate perfect man, who can understand learning in the process of general education, so as to achieve all-round development in all aspects[8].

With the in-depth study of general education, many domestic colleges and universities began to carry out the curriculum practice of general education. In 2001, Peking University began to implement the Yuanpei Program, students can select the content of study based on their own learning interests. In 2006, in order to better study the relationship between general education and professional education, Nanjing University, as a national key university, established Kuang Yaming Honors School to conduct specialized research on general education. In 2007, Shantou University implemented the model of optional general education courses in the curriculum of general education for the talent development program[9]. In 2019, in order to improve the quality of general education, East China Normal University adopted a new general education curriculum system composed of classic reading courses and core courses in the implementation of general education in combination with its own characteristics[10].

2 BASIC INFORMATION OF THE QUESTIONNAIRE

Students from some private colleges and universities got the questionnaires. A total of 316 questionnaires were returned and 304 were valid.

2.1 Reliability And Validity Test

The reliability and validity of the questionnaire data are analyzed. The results show that the reliability coefficient of this questionnaire is Cronbach's Alpha = 0.891. The validity analysis results are shown in Table 1. It can be seen that the reliability and validity of this questionnaire data are high.

Table 1: Validity Analysis of Questionnaire

KMO and Bartlett inspection		
Kaiser-Meyer-Olkin measure of sampling adequacy.		890
Bartlett sphericity test	Approximate chi-square	8071.911
	df	1081
	Sig.	000

2.2 Students' Understanding Of General Education

In the questionnaire, the level of understanding of general education is set as the hundred-mark system. The higher the score, the better the understanding of general education. This paper analyzes their understanding of general education from two aspects of gender and major, and makes a hypothesis testing. The results are shown in Tables 2 and 3.

Table 2 Understanding of General Education by Gender

Gender	N	Mean value	Standard deviation	t	Sig.
Male	86	72.33	25.058	1.88	0.061
Female	218	66.64	23.2		

The mean value of boys' understanding of general education is 72.33; and that of girls is 66.64. After significance testing, P = 0.061, greater than 0.05. Statistically, the difference is not significant. Finally, it can be concluded that there is no significant difference in the understanding of general education between different genders.

Table 3 Understanding of General Education by Major

	N	Mean value	Standard deviation	F	Sig
Arts	189	67.11	25.207	0.683	0.749
Science and technology	67	69.22	21.545		
Others	48	71.38	21.285		

The mean value of arts majors' understanding of general education is 67.11; that of science and technology majors is 69.22; and that of other majors is 71.38. Since the dependent variable of "understanding of general education" does not meet the normal distribution, the non-parametric test is used. After significance testing, P = 0.749, greater than 0.05. Statistically, the difference is not significant. Finally, it can be concluded that there is no significant difference in the understanding of general education between different majors.

3 SATISFACTION SURVEY OF GENERAL EDUCATION

The development of general education will be affected by many factors. This paper focuses on the impact of teachers, the rationality of curriculum content, the standardization of school management, and the types of general education on the satisfaction of general education curriculum.

Table 4 Analysis of Students' Satisfaction with Different Types of General Courses

Type	Mean value	Mid-value	Standard deviation	Minimum value	Maximum value	Skewness	Kurtosis
Fundamentals of computer science	80.46	82	19.991	0	100	-1.138	1.789
Language	80.28	82	19	9	100	-0.871	0.642
Science and technology	77.05	80	22.189	0	100	-0.978	0.927

Arts and culture	79.71	82	19.691	21	100	-0.659	-0.525
Physical education	80.75	83	18.795	21	100	-0.703	-0.39
Online optional general courses	80.19	82	19.093	9	100	-0.863	0.546

According to Table 4, students' satisfaction with general courses of science and technology is the lowest, with an average of 77.05; the highest is the general courses of physical education, with an average of 80.75; and the average of the other general courses is similar.

In Table 4, if the coefficient of skewness and kurtosis of course satisfaction value is less than 1, it can be considered as approximate to normal distribution, and linear regression can be used to further analyze the factors affecting satisfaction. Table 5 is a regression analysis of the influencing factors of general courses of science and technology with the lowest satisfaction score.

Table 5 List of Influencing Factors

Variable name	Influencing factor
C1	Teachers
C2	Rationality of content
C3	Standardization of school management
C4	Types of general education

Table 6 Influencing Factors of Satisfaction with Science and Technology Courses

	B	Standard error	t	Sig.	VIF	Sig.	DW	Adjusted R-square
ANOVA						0.000		
							2.101	0.436
Constant	7.355	4.651	1.581	0.115				
C1	0.153	0.098	1.558	0.12	3.666			
C2	0.232	0.125	1.853	0.065	5.827			
C3	0.22	0.096	2.284	0.023	3.336			
C4	0.258	0.11	2.332	0.02	4.61			

From Table 6, the adjusted R-square is 0.436, which is greater than 0.3. It shows that 43.6% of the satisfaction of science and technology courses is caused by the above factors. In ANOVA, the significance is 0.000, which is less than 0.05. It shows that the above listed influencing factors have an impact on the satisfaction of science and technology courses, which has a certain statistical significance. The value of VIF in the table needs to be less than 5 to prove that there is no multicollinearity between independent variables. From the table, the VIF of C2 is greater than 5, which does not meet the linear regression. Among the remaining three influencing factors, the significance of C1 is 0.12, greater than 0.05, i.e., C1 has no significant relationship with the satisfaction of science and technology courses; the significance of C3 is 0.023, less than 0.05, i.e., C3 has a significant relationship with the satisfaction of science and technology courses; similarly, the significance of C4 is 0.02, less than 0.05, i.e., C4 has a significant relationship with the satisfaction of science and technology courses. Finally, the regression equation is obtained by formula (1):

satisfaction of science and technology courses = 7.355 + 0.22 * C3 + 0.285 * C4   (1)

The analysis results of the satisfaction of the overall quality of general education are shown in Table 7.

Table 7 Influencing Factors of the Overall Quality of General Education

	B	Standard error	t	Sig.	VIF	Sig.	DW	Adjusted R-square
ANOVA						0.000		
							1.876	0.838
Constant	6.534	1.958	3.338	0.001				
C1	0.173	0.041	4.175	0.000	3.666			
C2	0.171	0.053	3.252	0.001	5.827			
C3	0.230	0.041	5.666	0.000	3.336			
C4	0.357	0.046	7683	0.000	4.61			

The adjusted R-square is 0.838, which is greater than 0.3. It shows that 83.8% of the overall quality of general education is caused by the above factors. The regression equation is obtained by formula (2):

the overall quality of general education = 6.534 + 0.173 * C1 + 0.23 * C3 + 0.357 * C4   (2)

Through the above analysis, it can be seen that the influencing factors of satisfaction of different types of general education courses are different, and the listed regression equations are also different. Among these influencing factors, the influence of teachers, standardization of school management and types of general education is broader than others.

4 BP NEURAL NETWORK

BP neural network model is constructed to evaluate the teaching quality of general courses. The four influencing factors were taken as neurons in the input layer, one neuron in the output layer represented the course quality, and the number of neurons in the hidden layer was set as 6. The neural network logic diagram is obtained, as shown in Figure 1.
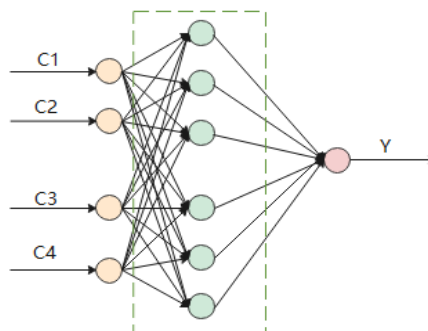
Figure 1 The neural network logic diagram

The data were then randomly divided into a training set of 70%, a verification set of 15%, and a test set of 15%. Finally, a three-layer BP neural network is constructed, as shown in Figure 2.
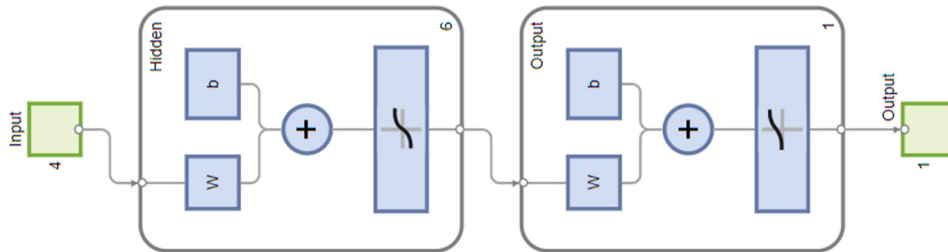

Figure 2 BP neural network

The model is trained and the results are shown in Figure 3. The accuracy of training set is 66.0%. The accuracy of verification set is 73.9%. The accuracy of the test set is 82.6%, so it can be seen that the training results meet the verification conditions.
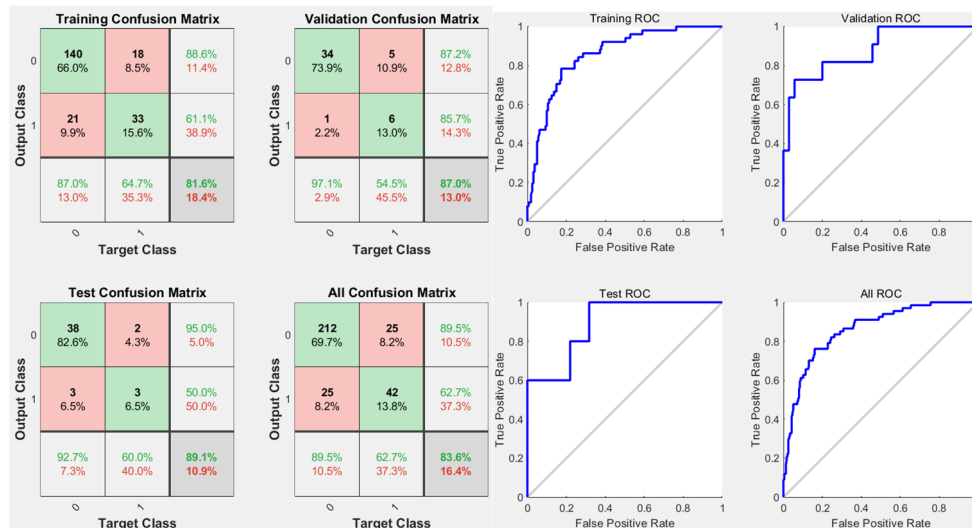

Figure 3 Confusion matrix and roc curve

AUC is the area under the ROC curve, which is a performance index to measure the quality of the model. The larger the AUC value, the better the model effect.

5 CONCLUSION

5.1 Existing Problems

Through the above analysis of the questionnaire survey results, it can be found that there are problems in the general education of private colleges and universities in the following aspects: some students do not fully understand the concept of general education, the arrangement of

optional general courses is unreasonable, and the courses that students are interested in need to be increased.

1. Students do not fully understand the concept of general education

According to the questionnaire survey, it can be found that students do not know much about general education in terms of gender difference or major difference.

2. Many students obtain their grades in general electives through other means.

According to the above questionnaire survey, some students in the online learning of general elective courses will be opportunistic, do not take the general elective courses seriously, and find someone to brush the courses and grades. Through research, it is found that the main reason why students do not want to learn general elective courses is that the class hours are not reasonable, the class hours are arranged too much and the practicability of the courses is not high.

3. Students' satisfaction with the courses needs to be improved

In the teaching process, from the perspective of students, give full play to the main role of students, that is to say, there should be a student-oriented education concept. Learning based on the courses that students are interested in is easy to stimulate students' interest in learning, and students are more willing to learn, so as to cultivate application-oriented talents with high comprehensive quality.

5.2 Solutions

In view of the above problems, the following suggestions are put forward.

1. Establish a correct concept of general education and conduct vigorously propaganda.

On the one hand, school leaders should attach great importance to general education and be able to carry out general education according to specific policies issued by the state and combined with the characteristics of the school. When the school leaders pay enough attention to general education, it is easy to carry out the propaganda of general education. On the other hand, teachers are the direct contact of students at school, and students are easy to get information from teachers' teaching activities. Therefore, in the process of teacher training, schools should let teachers have enough understanding and attention to general education. In this way, teachers can avoid professors who only pay attention to professional knowledge when teaching, and students can understand and accept the concept of general education unconsciously in their daily teaching activities.

2. Improve the curriculum and strengthen the standardization of school management.

The setting of general elective courses should have the characteristics of diversity, comprehensiveness and practicability, so that students can learn more subject content and promote students to master the knowledge system of various subjects.

3. Improve teachers' teaching level

Increasing the types of general education courses can provide students with a variety of choices. Students can find the courses they are interested in, so that their satisfaction with the general education courses can be improved. The school may set up a general education research group,

which shall be held by excellent teachers in the school. Organize teachers and excellent teachers to study and constantly improve teachers' own level.

REFERENCES

[1] Peng, W.(2005). The Guidance of Liberal Education Thought to the Idea of Running Univers ities in China Today. J. Fo rward Position. 04,140-142.

[2] Wang, X.Y.(2015). General Education Model, Challenges and Countermeasures in American Universities. J. China Higher Education Research. 04, 17-25.

[3] Li, M.L.(2018). On the New General Education Program of Harvard University and Its Imple mentation Effect. J. Peking University Education Review. 16(02),104-115+189-190.

[4] Liu, D.(2016). Research on the Reform of General Education Model for Ordinary Undergrad uates in Anhui University. Anhui University. Hefei.

[5] Su, P. (2018). Constructing the Teaching and Evaluation System of General Education Curric ulum Based on OBE Concept - Taking Tsinghua University as An Example. J. Research in High er Education of Engineering. 02, 129-135.

[6] Wei, M.M.(2020) Research on General Education Model in Normal Colleges. Shandong Nor mal University. Jining.

[7] Wang, Y.Q. (1999).Discussion on the Connotation of the Concept of "General Education". J. Tsinghua Journal of Education. 01,57-62.

[8] Liu, J.Y. (2019). Research on the Current Situation of General Education Courses in Ordinar y Undergraduate Colleges and Universities in Nanning. Nanning Normal University. Nanning.

[9] Cai, Y.L.(2021). Research on the Implementation Path of General Education in Universities o f Science and Technology. Harbin University of Science and Technology. Heilongjiang.

[10] Liang, C.(2017). Research on the Implementation Status and Strategies of General Educatio n in Colleges and Universities. Yangzhou University. Yangzhou.