

An Exploration of the Factors Influencing the Public Good of College Students under the Entropy Approach

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Abstract. In order to make China's public welfare activities develop better, this paper establishes a college students' public welfare evaluation model by entropy weight method through the study of the influencing factors of college students' public welfare, and examines the accuracy of the model by using BP neural network. The public welfare of university students is mainly affected by economic, epidemiological and academic factors.

Keywords: BP Neural Network, Entropy Assignment Method.

1. Introduction

College students' public welfare is an important way for college students to consciously practice socialist core values and take the initiative to devote themselves to a certain social practice [1], college students' public welfare plays an important role in the cultivation of the good spirit of college students, but today's college students' public welfare activities still have many problems such as college students' lack of some kind of spirit in public welfare activities, and college students' public welfare organisations are at a lower level, etc. [2]. Public welfare activities refers to the activities of individuals or certain organizations to donate goods, time, energy or knowledge to the community without compensation [3]. Public welfare is the inheritance of traditional Chinese culture; it is the inherent requirement for the development of a harmonious society in China; it is an important content for the spiritual and cultural development of our country; college students are the backbone of our country's social development, representing China's future and carrying the hope of the nation, so it is especially important to research and analyze the situation of public welfare for college students.

2. Establishment of the evaluation model of college students' public welfare influencing factors

In the post epidemic era, there are many factors from all aspects of society that profoundly affect the process of college students' public welfare, in order to better quantify the impact of the influencing factors on public welfare activities; this paper innovatively combines SWOT analysis and entropy assignment to screen the influencing factors on public welfare activities and determine the weight coefficients of the influencing factors, which is the degree of importance of the indicator items in the evaluation system. The larger the coefficient is, the more importance is attached to it [4]; on this basis, the accuracy of the model is verified by using BP neural network after GA optimization.

Through the analysis of various influencing factors, we get that academic factors, epidemic factors, and economic factors play an important role in the influence of college students' public welfare, and colleges and universities can reduce the influence of these major factors on college students' public welfare by perfecting the comprehensive evaluation system, reducing the pressure of students' coursework, and giving financial support to college students and expanding new public welfare methods.

2.1. SWOT analysis

SWOT analysis is actually a method to synthesize and summarize the internal and external conditions of the object, and then analyze the strengths, weaknesses, and opportunities and threats

[5]. SWOT stands for Strengths, Weaknesses, Opportunities, Threats, etc. Through SWOT analysis we can quickly identify the key influencing factors, and the method is shown in the figure below.

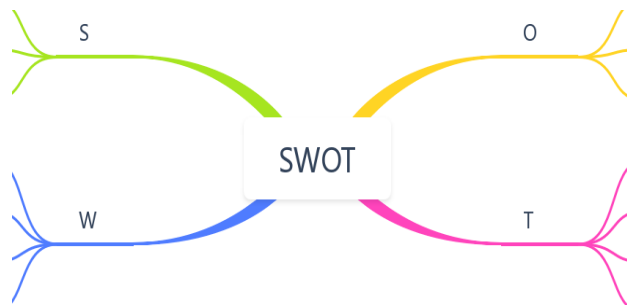


Figure 1. SWOT analysis of influencing factors

2.2. Entropy assignment method

Compared with other methods, the entropy weight assignment method can be more objective to the allocation of weighting customs, so that it can really speak with numbers [6], the steps are:

- (1) Determine the decision matrix.
- (2) Normalize and normalize the decision matrix.
- (3) Calculate the information entropy and weight of each index.

$$A_{ij} = a_{ij} \tag{1}$$

$$r_{ij} = f(A_{ij}) \quad \dot{r}_{ij} = \frac{r_{ij}}{\sum_{i=1}^n r_{ij}} \tag{2}$$

$$e_j = -\frac{1}{\ln n} \sum_{i=1}^n \dot{r}_{ij} \ln \dot{r}_{ij} \tag{3}$$

$$w_j = \frac{1 - e_j}{\sum_{k=1}^m (1 - e_k)} \tag{4}$$

2.3. BP Neural Network

BP neural network is often used in the model of regression and prediction and other issues its schematic diagram shown in Figure 2, in order to prevent the network from falling into the problem of local optimal solution, and to solve the shortcomings of the BP neural network poor search ability [7], this paper introduces the GA genetic algorithm, through the crossover operation, heterogeneous operation to optimize the optimal solution of the weights of the Hinder Layer (Hinder Layer) and the threshold value to solve the problem.

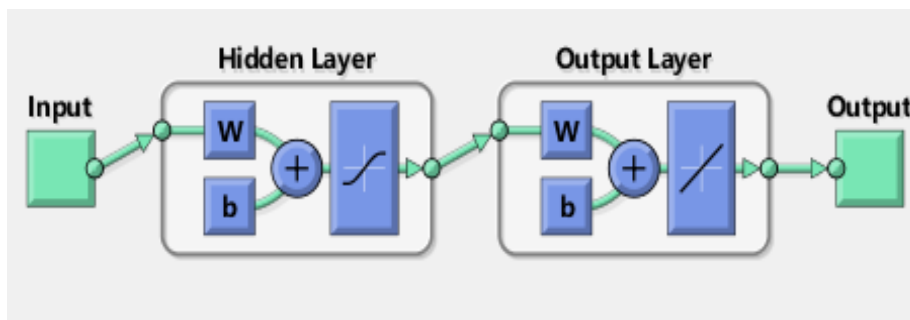


Figure 2. Neural network schematic diagram

3. Results

Weighting coefficients of the various influencing factors

Table 1. Weighting coefficients of factors

entropy weighting		Information entropy value	information utility value	Weight
motivational		0.972	0.028	5.307
meaningfulness		0.983	0.017	3.144
economic factor		0.9	0.1	18.855
Academic factors		0.778	0.222	41.613
Prejudice against volunteers		0.971	0.029	5.357
Family factors		0.977	0.023	4.276
Epidemic factors		0.898	0.102	19.089
one's own factors		0.987	0.013	2.359

Through Table 1, we can know that economic factors, academic factors, epidemic factors are the main factors affecting the public welfare of college students, multiply the factors by the weight coefficients and now add up to establish a comprehensive evaluation score of the public welfare of college students; in order to validate the accuracy of the comprehensive evaluation system for college students, the use of neural networks in the establishment of a BP neural network between the various factors affecting the performance of the network as shown in Figure 3

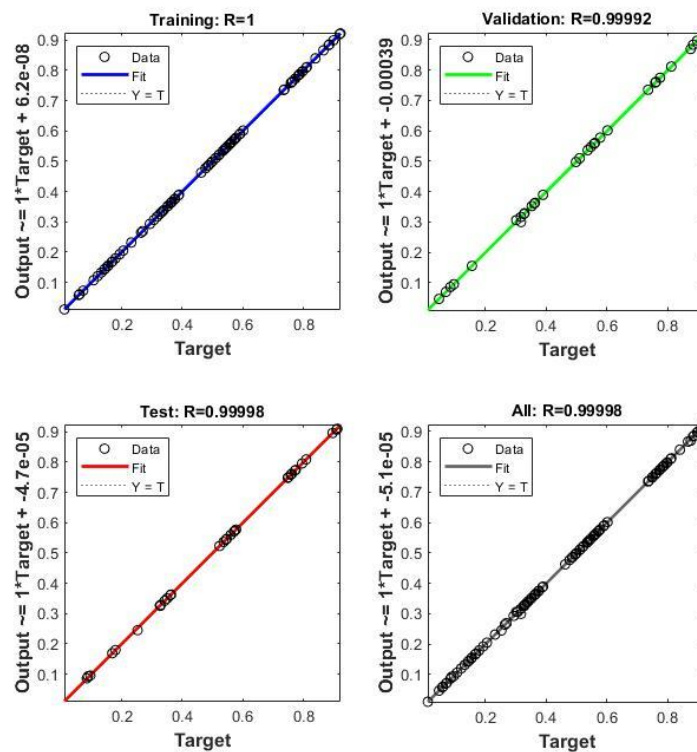


Figure 3. the establishment of a BP neural network

The correlation coefficient (R-value) takes the range of [0,1], the larger the correlation coefficient indicates the stronger the correlation between the variables, and from the above figure, it can be seen that the network performs well.

Table 2. Comparison of data

Training data	real data
0.7532	0.7577
0.8323	0.8299
0.7432	0.7435
0.8553	0.8555
0.6303	0.6311

Comparing the training data of the neural network and the real data, it can be seen that the model of college students' influencing factors is well established.

Table 3. Composite scores for different status groups

	Identities	Average composite score
political profile	political party member	0.785
	Communist Youth League member	0.802
distinguishing between the sexes	the masses	0.623
	Man	0.667
grade	Women	0.656
	first-year university student	0.632
	second-year university student	0.627
	third-year university student	0.649
	fourth-year university student	0.625
	postgraduates	0.632

From Table 3 we can get, from the gender and grade point of view, university students public welfare comprehensive score does not differ much, from the political profile point of view, party members and the Communist Youth League members of the comprehensive score (participation in the enthusiasm) is significantly higher than the masses of. This is mainly because the main characteristic of the Communist Youth League members and party members is responsibility, in learning and life by example, play a leading role, so in the influence of factors for party members and Communist Youth League members of the overall impact to be relatively small [8].

4. Conclusions

Academic factors greatly affect the public welfare of college students in the public welfare evaluation model, the weight factor of academic factors is as high as 41%, so colleges and universities urgently need to improve the comprehensive evaluation of college students, so that college students can put as much as possible into social practice.

In the general environment of the epidemic, public welfare in the impact of the epidemic at the same time also gained a lot of new development direction such as community publicity and education, online counselling, ant forest and other network public welfare [9]; local universities and colleges can promote college students' public welfare by expanding public welfare channels.

College students' public welfare activities are also constrained by economic factors, in China's central and western regions are still in a populous and economically backward state [10]; therefore, the economic situation of college students will have a certain impact on the participation of college

students in public welfare, which should be established by universities and colleges of college students' public welfare associations and give some financial support.

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