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ANALYSIS ON IMPACT OF INTERNET CULTURE TO THE SENSE OF WORTH FOR UNIVERSITY STUDENTS AND ITS STRATEGY

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ABSTRACT

The multilayer perceptron is becoming more popular because of its characters such as fault tolerance, robustness and low request for the info. In this article the impact of the network to sense of worth for the university students is studied by using the multilayer perceptron model. The model can fit better and the coefficient of determination is 0.915; the relative error is 0.012±0.003. The internet culture can influence the concepts of knowledge, intercourse, politics, morality and freedom of the university students and the result is just like other documents. The multilayer perceptron model can be used to analyze the impact of the network to the sense of worth for the university students.

Keywords: *Internet Culture, University students, Sense of Worth, Multilayer Perceptron*

1. RESEARCH BACKGROUND

The 21st century is the network information era. With the development of internet technology, the number of the netizens is dramatically increasing. On Jul. 19, 2012 CNNIC issued the 30th China Internet Development Statistic Report, which shows that till the end of June 2012, the netizens reached 538,000,000, among which 388,000,000 were mobile phone netizens more than 380,000,00 computer netizens and the internet penetration was 39.9%. The increasing amount of netizens is 24,500,000 in the first half of 2012 and the penetration is 1.6%, among which 30.2% netizens are 20-29 years old; 21.6% are college students; the ratio of the student netizens is 28.6% [1]. As the most active group in society, the university students are the fresh forces of the netizens, especially when the phone function increases. The internet culture also has both good and bad affects on the university students, so how to evaluate the impact of the internet culture to the university students objectively is a problem to be solved. In the past, we just analyzed it theoretically without the objective data. So here we use the multilayer perceptron to evaluate the impact of the internet culture to the sense of worth for the university students objectively.

2. INTRODUCTION OF MODEL OF THE MULTILAYER PERCEPTRON

Artificial neural network(ANN) is a rising borderline science. Compared to the mathematical statistics, it doesn't need exact mathematical model, It can make up the deficiency of mathematical statistical methods and solve some problems that traditional statistical methods failed to resolve.

With the rapid development of science and technology, so does artificial neural network. And it is also important in the intelligence field. It has already extensively applied to many fields, such as handle singles, mode identify, machine control, expert system. And it has got more thorough development in predicting field. BP neural network is a typical algorithm in the artificial intelligence network, and it has very strong nonlinear mapping capability. Its most outstanding ring is to solve some nonlinear problems. Also it has many other advantages, its network topology structure is simple, it has high margin precision, it is easy to program, and it has very strong maneuverability, etc. Therefore, the application of BP neural network becomes more extensive, and it has become one of the most important algorithms in intelligence field, the figure of the flow diagram of feedback network is Figure 1 and the structure of feed forward is Figure 2.

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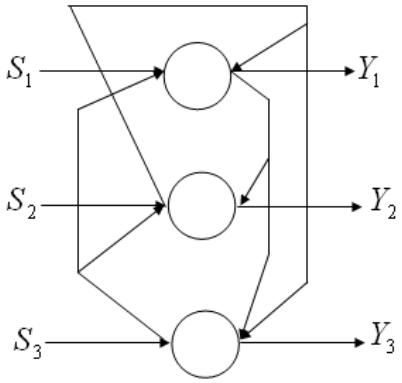

Figure 1: The Flow Diagram Of Feedback Network

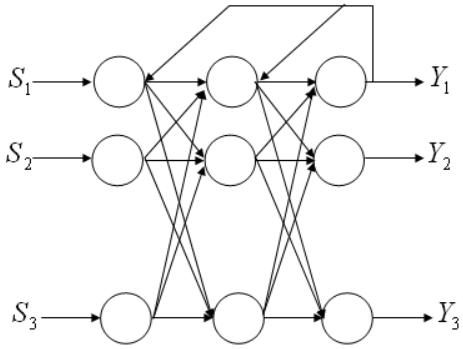

Figure 2: The Structure Of Feed Forward

Although Standard BP neural network has many advantages, also it has many disadvantages. Its optimization algorithm is based on the most soon calculate way algorithm. The most soon calculate way algorithm has many disadvantages, such as slow convergence speed, easily run into local minimum dot. Therefore, in the side the standard BP calculate way has the same disadvantages, and it leads to the shortage of study capability of network. In addition to the disadvantages due to the most soon calculate way algorithm, also it is hard to get the needing layers and the nodes in each layer of the implicit layer of BP network. And it is a kind of neural network with tutor. As the instruction information, each input mode must know the expect output and margin precision. To the disadvantages of standard BP network, many domestic and international scholars have done detailed research with that, and they put forward many enhanced algorithms. A single neuron is Figure 3 and a multi-layer feed forward neural net is Figure 4.

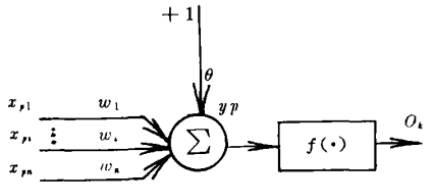

Figure 3: A Single Neuron

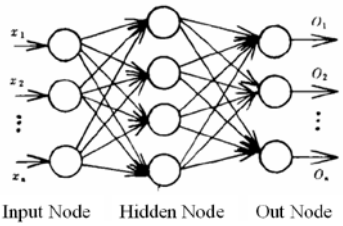

Figure 4: A Multi-Layer Feed Forward Neural Net

Multilayer Feedforward Neural Network is raised by Rumelhan, which uses the error back propagation learning algorithm, also called Error Back Propagation (EBP).

The nerve nodes of the Multilayer Feedforward Neural Network are arranged layer by layer, and the layers are generally input layer, output layer and hidden layer. The nerve nodes in the same layer are independent, while the nodes in the adjacent layers are linked. The output variable of the nerve nodes in the front layer is the output variable of the nerve nodes in the behind layer [2], which can be shown in Fig. 5.

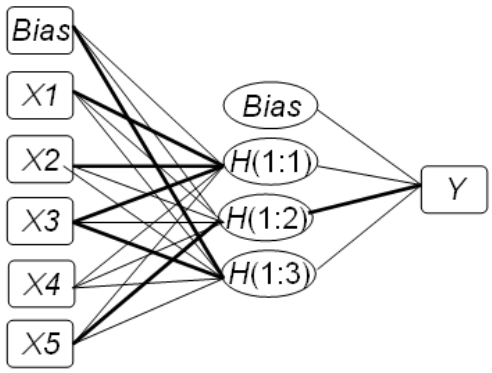

Figure 5: Network Diagram Of Multilayer Perceptron

The normal algorithm to train the multilayer perceptron is Back-Propagation and the calculation process is as follows.

2.1 Symbol Description

Suppose there are N pairs data $(X_k, Y_k'), k = 1, 2 \cdots N$. The output variables are $X_k = (x_{1k}, x_{2k}, \cdots, x_{nk})$ and there are n outputs

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correspondingly. The output variable for k is $Y_k = (y_{1k}, y_{2k}, \cdots y_{mk})$ by using Neural Network Approach and its predicted output variable is $Y_k' = (y_{1k}', y_{2k}', \cdots y_{mk}')$. Their corresponding number of network output is m. After inputting X_k, I_{jk}^l represents the input of the jth node when it spreads to the l th layer; O_{jk}^l represents the output of the jth node in the l th layer; $W_{ji}^{(l-1)}$ represents the weight between the two layers; b_i^l is the threshold of the ith node in the l th layer; n^l is the number of the nodes and f is the transmission function.

2.2 The Forward Propagation Of The Network

The output variable of the neural network is $X_k = (x_{1k}, x_{2k}, \cdots, x_{nk})$, and the corresponding output is $O_{ik}^l = x_{ik}$. In the hidden layer and the output layer, set the node in l -1 layer is i, then the jth node in the l th layer is

$$I = \sum WO + b$$

That is

$$I_{jk}^l = \sum_{i=1}^{n^{l-1}} W_{ji}^{(l-1)} O_{ik}^{(l-1)} + b_j^l$$

Arrange to

$$I_{jk}^l = \sum_{i=1}^{n^{l-1}} W_{ji}^{(l-1)} O_{ik}^{(l-1)} + b_j^l = \sum_{i=0}^{n^{l-1}} W_{ji}^{(l-1)} O_{ik}^{(l-1)} \quad (1)$$

Suppose b_j^l is the weight $W_{jo}^{(l-1)}$ for the fixed input $O_{ok}^{(l-1)} = 1$; then the output corresponding to the jth node is as below, then

$$O = f(I)$$

That is

$$O_{jk}^l = f(I_{jk}^l) \quad (2)$$

Suppose the l th layer is the output layer of the model; the output node is j; then the output error of the jth node is as below,

$$E_{jk}^l = O_{jk}'^l - O_{jk}^l \quad (3)$$

The actual output O_{jk}^l and the desired output $O_{jk}'^l$ can be illustrated by y_{jk} and y_{jk}'. So the error of the jth node is

$$E_{jk}^l = y_{jk}' - y_{jk} \quad (4)$$

The sum of the squared errors is

$$E_k^l = \frac{1}{2} \sum_{j=1}^{n^l} (E_{jk}^l)^2$$

Arrange to

$$E_k^l = \frac{1}{2} \sum_{j=1}^{n^l} (E_{jk}^l)^2 = \frac{1}{2} \sum_{j=1}^{n^l} (y_{jk}' - y_{jk})^2 \quad (5)$$

2.3 The Back Propagation Of The Network

The error back propagation algorithm is based on the error negative gradient to change the weight and then we get

$$\Delta W_{ji}^{(l-1)} = -\eta \frac{\partial E_k^l}{\partial W_{ji}^{(l-1)}} \quad (6)$$

Because

$$-\eta \frac{\partial E_k^l}{\partial W_{ji}^{(l-1)}} = W_{ji}^{(l-1)} + \Delta W_{ji}^{(l-1)}$$

Comprehensive available:

$$W_{ji}^{(l-1)} = W_{ji}^{(l-1)} + \Delta W_{ji}^{(l-1)} \quad (7)$$

If the output layer is l ,

Then

$$\eta(y_{jk}' - y_{jk}) f'(I_{jk}^l) O_{ik}^{(l-1)} = W_{ji}^{(l-1)} + \Delta W_{ji}^{(l-1)}$$

Arrange to

$$\Delta W_{ji}^{(l-1)} = \eta(y_{jk}' - y_{jk}) f'(I_{jk}^l) O_{ik}^{(l-1)} \quad (8)$$

When l is the hidden layer, the desired output does not exist. Therefore, the error of the hidden layer is determined by the error recursion calculated by the neuron directly linked to the hidden layer. The local gradient of the neuron in the hidden layer can be re-defined as below,

$$\delta_{jk}^l = -\frac{\partial E_k^l}{\partial O_{jk}^l} \frac{\partial O_{jk}^l}{\partial I_{jk}^l}$$

Substitution the above formula

$$\delta_{jk}^l = -\frac{\partial E_k^l}{\partial O_{jk}^l} f'(I_{jk}^l) \quad (9)$$

Then we can get

$$\Delta W_{ji}^{(l-1)} = \eta(f'(I_{jk}^l) \sum_{q=1}^{n^{l+1}} \delta_{qk}^{(l+1)} W_{qj}^l) O_{ik}^{(l-1)} \quad (10)$$

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When the error back propagates, we can get the correction based on (8) and (10), then we can re-calculate the connection weight according to (7).

3. THE ESTABLISHMENT OF THE MODEL OF IMPACT OF THE INTERNET CULTURE TO THE SENSE OF WORTH FOR THE UNIVERSITY STUDENTS

3.1 The Choice Of The Input And Output Variables

After referring to the references [3-13] and consulting the experts who are engaging in the student ideological education, we figure out that the impact of the internet culture to the sense of the worth for the university students can be shown in the concepts of knowledge, communication, politics, morality and freedom. The output variable uses the student comprehensive evaluation results. The results of the input and output variables can be found in Table 1 and Table 2.

Table 1: The Result Of The Input And Output Variables(1)

Variables	Average	Standard Deviation
Concept of Knowledge	14.25	2.17
Concept of Intercourse	10.86	1.95
Concept of Politics	16.44	2.39
Concept of Morality	15.81	2.63
Concept of Freedom	12.32	2.31
Result of Comprehensive Evaluation	81.75	22.86

Table 2: The Result Of The Input And Output Variables(2)

Variables	Average	Standard Deviation
Concept of Knowledge	15.23	2.05
Concept of Intercourse	10.53	1.99
Concept of Politics	15.46	2.90
Concept of Morality	14.01	2.68
Concept of Freedom	13.37	2.30
Result of Comprehensive Evaluation	83.77	24.56

3.2 The Result Of Model

Taking the results of the concepts of knowledge, intercourse, politics, morality, and freedom as the input variables, the result of the comprehensive evaluation as the output variable, we establish a multilayer perceptron model and analyze the importance of the input variables to the output variables. The result can be seen in Table 3, Table 4 and Fig.6. From Table 3, the internet culture can improve the concepts of politics, morality and knowledge. The university students hope the politics can be open to the public. Now with the establishment of the government website, the students can clearly know the government and establish a right concept of politics. In the aspect of the concept of morality, with the wide spread of the internet, the society relationship of the students will be diversified. Especially in the conflicts, their concept of morality will be refreshed. Meanwhile, the developed network will enrich their knowledge. But the internet culture will have a negative effect on the concepts of culture and intercourse. Now many university students are addicted to the internet and communicate with others less. On the net, the university students are the both the info acceptors and the makers. With fewer limitations on the net, many people can spread the info and remarks arbitrarily. These remarks are always impractical and antisocial, which can drive the university students undisciplined and to show anarchy.

Table 3: Model Fitting Result

Parameters	Result
Coefficient of Determination	0.915
Relative Error	0.012±0.003

Table 4: The Importance Of The Input Variables

Variables	The Degree of Importance	The Normalized Degree of Importance（%）
Concept of Politics	0.300	100.0
Concept of Morality	0.195	65.1
Concept of Knowledge	0.105	35.0
Concept of Culture	0.069	23.0
Concept of Communication	0.016	5.4

Note: The standardized degree of importance can be got by using the standardized data.

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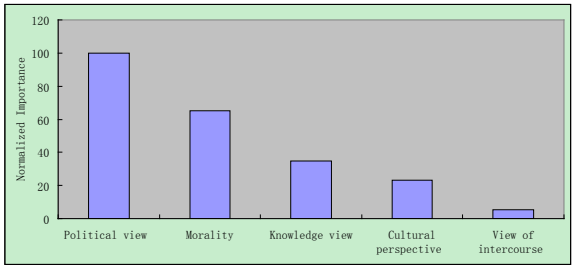

Figure 6: Diagram Of The Importance Of The Input Variables

4. CONCLUSION

In this article, the multilayer perceptron neural network model has been used to evaluate the impact of the internet culture to the sense of worth for the university students. The research result can correspond to the practical situation; the internet culture has both the positive and negative impacts on the university students. We can try to help the students establish the right sense of worth in the following aspects. Firstly, we should promote the internet culture actively and create a safe and healthy campus cultural atmosphere; secondly, we should strengthen the internet legal awareness and morality concept; thirdly, we should strengthen the construction of campus network and develop the campus network service; the last not the least, we should strengthen the administration of the campus network and the safety monitoring.

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