Study on University Students’ Time Management Based on Neural Network

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Abstract

In this article, we put forward the evaluation of college students’ time management ability of the three-dimensional appraisal model: time conscious, time planning, time performance. And then the current situation of time management ability of college students and the problems of the preliminary analysis are presented: in the new media environment, nearly half of the people still lack the sensitivity to time consciousness; there are less than half of the students exist the planning on the time; there are more than half of the people have higher time performance. In order to further analysis the possible factor to college students’ time management ability, using artificial neural network based on three-dimensional evaluation model makes the grade classification of student management. On this basis, we identified the possible factors (gender, grade, professional, student cadre, origin of students) to the college students’ time management ability through the data comparison.

Keywords: time management, time consciousness, time execution, neural network

1 Study Method

1.1 Data Reasonableness Test

1 This article is supported by the program of innovation training of university students in Tianjin City at 2014 (No. 201410061086).
2 Corresponding author
By observing and analyzing, we find that there are some errors about the data. For example, some themes only have two options, A and B, but the answer was C, this is obvious error, we remove it to ensure the correct of the results. We get 933 questionnaires by the program, there are 75 invalid questionnaires. In order to verify the accuracy of the questionnaire, we set up 5, 4, 3, 2, 1 score about the five options, statistics each questionnaire scores, according to the score, high extraction group of low 27% and 27% of the group as an independent sample t-test samples, the significance test results are shown in table 1:

Table 1: Independent sample t-test

<table>
<thead>
<tr>
<th>Questions</th>
<th>Q 1</th>
<th>Q 2</th>
<th>Q 3</th>
<th>Q 4</th>
<th>Q 5</th>
<th>Q 6</th>
<th>Q 7</th>
<th>Q 8</th>
<th>Q 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significance</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Questions</td>
<td>Q 11</td>
<td>Q 12</td>
<td>Q 13</td>
<td>Q 14</td>
<td>Q 15</td>
<td>Q 16</td>
<td>Q 17</td>
<td>Q 18</td>
<td>Q 19</td>
</tr>
<tr>
<td>Significance</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>t value</td>
<td>-14.77</td>
<td>-7.59</td>
<td>-7.85</td>
<td>-10.60</td>
<td>-0.38</td>
<td>-5.40</td>
<td>-6.28</td>
<td>-3.64</td>
<td>-3.33</td>
</tr>
</tbody>
</table>

The results shows that removing effect titles and question 15, there are significant differences at p = 0.05 level. So, the rest of the topic can be retained, and the questionnaire is reasonable.

1.2 Determine the Ability of Time Management Standard

In order to objectively analysis college students’ ability of time management in TianJin, we discuss the influence of the new media to the time using situation of college students from three dimensions, the time conscious, time planning and time performance. Some researchers[1], [2] think that time structure reflects the individual’s levels of organized and purposeful usage, and divided the time structure into the purpose, the behavior with conventional structure, the current orientation, the effective organization and persistence on the five dimensions. Zhang Meng[3] compared the time management with the operating system of computer, and divided the time management into macro, intermediate and micro three levels. This paper establishes the structure figure (figure 1) of the college students’ time management ability based on the questionnaire of statistical data.
1.3 Analysis of the factors of college students’ time management

In the section, we discussed whether these factors, including grade, gender, profession, whether the student cadres and origin of students, would influence the time management ability of Tianjin college students.

In order to reduce the lengthiness and complexity of the analysis process, each dimension was divided into superior, middle, and poor three ranks by the Neural Networks. So, the number of students at every rank could reflect the difference and characteristic of time management ability which was influenced by those factors. Self-Organizing Neural Networks is capable of training and judging the input mode, finally it can be divided into different types. The paper used this advantage to make three-dimensional score of time conscious, time planning, time performance as the input layer, the neural network output excellent, middle, poor ranks of each dimension.

Competitive network can be divided into the input layer and competitive layer. Assume that the input layer has N number neurons and there is M number of competitive layer neurons. The value of the network connection weights is

\[ W_{ij}, i = 1, 2, \cdots, N, j = 1, 2, \cdots, M \]

And satisfy the conditions

\[ \sum_{i=1}^{N} W_{ij} = 1 \]

In the competition layer, neurons compete with each other, and ultimately there is only one or a few neurons win to adapt to the current input sample. Competition victory neurons represent the current input sample classification model. Take the gender as an example, the questionnaire of 80 percent were regarded as the training sample, the remaining 20 percent of the samples randomly selected 10 questionnaires as a test sample. The time conscious was divided into excellent, middle, poor time awareness. Thus, there is need to set three neurons. In order to accelerate the learning speed, the learning efficiency is set to 0.1. Then, the data were normalized, Formula is as follows:
\[ x = \frac{x' - x_{\text{min}}}{x_{\text{max}} - x_{\text{min}}} \]

Where \( x' \) is the original data, \( x_{\text{min}} \) is the minimum value of the original data, \( x_{\text{max}} \) is the maximum value of the original data. This will compress the raw data to the \([0, 1]\), it can help train the neural network. Training data of sample testing results are in table 2:

Table 2: Training Results

<table>
<thead>
<tr>
<th>sample</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>questionnaires scores</td>
<td>3.15</td>
<td>3.15</td>
<td>3.45</td>
<td>3.65</td>
<td>3.90</td>
<td>4.10</td>
<td>4.30</td>
<td>4.10</td>
<td>4.10</td>
<td>3.10</td>
</tr>
<tr>
<td>Neural Networks</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Interval evaluation</td>
<td>poor</td>
<td>poor</td>
<td>medi</td>
<td>outs</td>
<td>outs</td>
<td>outs</td>
<td>outs</td>
<td>outs</td>
<td>outs</td>
<td>poor</td>
</tr>
</tbody>
</table>

Judging from the classification of samples tested, the neural network training results are reliable can be used for time-conscious classification.

2 Analysis of the results

2.1 Present situation of college students’ time management ability

The time conscious (Figure 2): The chart indicate that 92.41% of the students think they can effectively manage time, there are 71.06% of students think it is important to manager time and eager to manager personal time, the result indicate that there are a lot of students think that the time is very important, and they eager to use the time more reasonable. But there are 68.64% of students hold that the time is not sufficient, only 13.98% think the time is sufficient.

The time planning (Figure 3): The chart indicate that up to 58% of the students have no time planning, early 70% of students spend time on new media more than an hour. In additionally, 29.17% of the students have a clear plan, 42.94% of the students in mobile Internet, 22.71% of the students in study, 21.68% in communication and 12.65% of the students in other activity about this part of time. This result show that most of the students lack of the time planning consciousness, can’t arrange the time more reasonable.

The time performance (Figure 4): The chart indicates that there are 52.59% of the students are not affected by external environment, have higher execution. 36.4% of the students complete the task is procrastination, and 70.06% of the students can control to don’t play mobile phone in class, 64% of students learning
more than 2 hours every day. This result shows that about half of the students can complete the task according to their schedule, but there are nearly half of all students whose execution is weak, can’t resist the influence of the external environment, and cannot complete the task in time.

Figure 2. The result of time awareness

Figure 3. The result of time planning
There are some problems, firstly, part of the students’ time consciousness is still weak, and the improvement of time consciousness is essential for effective time management. Second, nearly half of the people just stay the time planning in thought, we will effect on the time management unless implement the time planning. Finally, because of lacking the time planning more reasonable, it caused nearly half of the students have a low time execution.

2.2 Possible Factors Influencing the Time Management Ability
This part, we plot a bar graph using the neural networks classification data of different gender as shown in figure 5, from the result, different gender have no significant difference on the time consciousness and time planning aspects. The proportion of boys and girls at the excellent time consciousness are almost equal, the proportion of boys at middle time consciousness is slightly higher than girls, only 8.27 percent more; although the situation of girls in time planning is a bit better than boys, only 6 percent more. At the time execution aspect, the performance of boys is more superior, but relatively poor girls. Boys’ performance in this area accounted for 46.8 percent of the excellent, while girls accounted for only 33.4 percent, there are a significant difference.

As can be seen form figure 6: at the time awareness aspect, student cadres and non student cadres hold almost identical ratio at superior, middle, and poor three ranks, which reflect whether the student cadres has no significant difference. At the time planning, student cadres perform better than non student cadres, the proportion of student cadres at the excellent rank account for 43 percent, rather than the non student leaders at the excellent rank is only 31 percent. In addition, the student cadres are 5 percent lower than the non student cadres at the poor rank. At the time execution aspect, the performance of the student cadres is not better than non student cadres. Especially at the excellent rank, the ratio of student cadres is
only accounted for 27.8 percent, while the ratio of non student cadres is 48.8 percent. The difference is quite significant. In the poor rank, student cadres accounted for 31.25 percent, non-student cadres accounted for only 23.3 percent. There are also significant differences.

As can be seen from Figure 7, students from different regions have a very significant difference in time management ability. In terms of time consciousness, the percentage of students in the southwestern region is highest level at the excellent rank, up to 59.6 percent. While the students from East China and North China hold the lowest proportion at this rank. The grade distribution of Central, South, and Northeast China is at the middle level, and the distribution of these three regions with high similarity. By comparing data of the graph above, we can find that the students from Central, East, North and South is more prominent at the time planning, respectively accounted for 50%, 46%, 42% and 40%. On time execution, by comparison chart we can see that students in northwest, central, east and northeast area have little difference. And in relation to all other regions, its performance in this regard is also more prominent, each rates were 42%, 38%, 40% and 34%, while other regional capacity in this regard need to be improved, especially in the southwest.

As can be seen from the figure 8, the time consciousness of the students has obvious difference. Engineering students have a strong sense of time, master accounted for 75%; Science students is the worst in time consciousness, poor grade accounted for 75%, other professional students’ sense of time is in average level. In the time planning, students of management science and engineering have stronger ability, and outstanding candidates accounted for 65% and 60% respectively. While, the students from the literature and agronomy specialty have weak time planning ability. In time performance, students of all the profession are not identical, and have certain significant differences. Students of literature majors are more outstanding in this aspect.

We can see from figure 9, on the dimension of time consciousness, the freshman and senior students are better than the sophomore and the junior students. On the dimension of time planning, the sophomore and the senior students are worse than the freshman and the junior students, their proportion of poor grade are 67% and 56% respectively. On the dimension of time performance, the junior students are the best, its outstanding portion is 37% and middle portion is 23%. While the sophomore students are the worst, its outstanding portion is only 10%, but its poor portion is 77%. So, there is obvious difference in time management ability along with the change of university students’ grade.
Figure 5 Difference in gender

Figure 6 Difference in student cadres
Figure 7 Difference in origin of students

Figure 8 Difference in specialty of students
3 Conclusions

Through the analysis of university students’ time management ability in Tianjin city, this paper puts forward the following Suggestions: Firstly, university students should be encouraged to set up correct concept of the time. From this investigation, some students have no sense and can’t manage their time, so university should regularly carry out corresponding counseling, correcting students’ wrong concept of time, establishing a clear time schedule and checking the implementation of time schedule to complete the task absolutely\(^{[4]}\). Secondly, university should cultivate students’ ability of time management based on their character. For example, university can cultivate students’ time management ability according to the difference on the gender, specialty, grade, students’ origin and student cadre.

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