Research on College Student’s Happiness Index Based on AHP Method

He-Zi WANG\textsuperscript{1,a} and Lin BAI\textsuperscript{1,b,*}

\textsuperscript{1}Beijing University of Posts and Telecommunications, Beijing, China
\textsuperscript{a}wanghez.jelly@gmail.com, \textsuperscript{b}bailin@bupt.edu.cn

*Corresponding author

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Abstract. This article adopts the combination of qualitative and quantitative analysis to construct the happiness index model and index system of college students. The happiness index is accurately calculated by using the analytic hierarchy process. The weight value of happiness index is determined by three-layer structure and two-level index. This article figures out in 5 aspects of physical and psychological health, realization of self-value, harmonious relationship between dormitories and families, confidence in future careers, self-acceptance that college students can feel the happiness in campus life, and give suggestions to the university on college students' mental health and training programs in the future.

Introduction

With the increasingly fierce competition in the society, college students and graduate students will face more and more stress in their studies, career choices, and lives. In recent years, various mental health problems among college students have been increasing, and some extreme cases such as suicide, murder, and mental illness have also been reported. Therefore, paying attention to the happiness of college students, exploring the factors affecting the happiness of college students, and improving the level of happiness of college students are of great significance for promoting the mental health of college students and building a harmonious university.

Construction of College Student Happiness Index Model

Data Sources

The survey adopts the form of an online questionnaire. The questionnaire has 12 major questions, covering both qualitative and quantitative issues. The survey object was students from universities in Beijing, and 165 valid questionnaires were collected. Then, the R language is used for data processing and calculation of corresponding parameters of AHP method.

Determination of the Index System

At present, there is no unified index system of happiness index in the world. Basically, each researcher constructs an index system of happiness index according to his or her research perspective and object. For example, the Happiness Planet Index is constructed from three categories: life satisfaction, life expectancy and ecological footprint \cite{1,2}. As for the college student happiness index measurement, it does not form an authoritative sample. Therefore, according to the Global Subjective Well-Being Scale (GWB), the OECD happiness index and the "Survey Questionnaire for College Students" compiled by Professor Li Wenli from Peking University, it is concluded that the main sources of happiness for college students are emotion, recognition, talent and etc. \cite{3,4}.

On the other hand, happiness is a positive psychological experience of a person \cite{5}. Therefore, we should also use positive psychological experience as the basis when constructing happiness index system. Therefore, based on the survey results and the existing happiness index system in the society and combined with the characteristics of college students, 4 dimensions and 20 items of college student happiness index indicators were determined \cite{6}. The four dimensions are: learning status, living environment, interpersonal relationship and self-value \cite{7}. Among them, each dimension includes 5 items. Based on this, the index model established is shown in Table 1.
Table 1. College Student’s Happiness Index Model.

| College Student’s Happiness Index Model | Good hardware facilities of learning C11 |
|----------------------------------------|-----------------------------------------|
| Learning Status B1                     | Intense learning atmosphere C12         |
| Student Happiness Index C1             | High teaching / research level of teachers C13 |
| Model O                               | Pay and return are in balance (Hard work promises a scholarship) C14 |
|                                       | Ability to apply what has been learned to practice (scientific research, internship) C15 |

Living Environment B2
- Good health conditions C21
- Good hardware facilities of campus life C22
- High quality staff in school C23
- Advanced school education management and training C24
- Excellent family economic conditions C25

Interpersonal Relationships B3
- Dormitory relationship C31
- Relationship with teacher (mentor) C32
- Family relationship C33
- Classmate Relationship C34
- Love relationship C35

Self-value B4
- Can develop their own hobbies C41
- Self-acceptance C42
- Confidence in future career development C43
- Positive attitude towards life C44
- Can create value for society C45

College Student’s Happiness Index Model Analysis

**Calculate the Weight of Each Indicator by AHP Model**

According to the College student’s happiness index model, through the inquiry of relevant experts and the questionnaire survey of students, after analysis and summary, the corresponding judgment matrix is established by scoring. Form the judgment matrix of each level as shown in Table 2 to Table 6, and use the analytic hierarchy process to calculate the weight of each evaluation index factor.

Table 2. Judgment Matrix for Happiness Index of College Students.

|     | B1   | B2     | B3     | B4     | Weight |
|-----|------|--------|--------|--------|--------|
| B1  | 1    | 10/9   | 10/9   | 5/4    | 0.224  |
| B2  | 9/10 | 1      | 1      | 9/8    | 0.248  |
| B3  | 9/10 | 1      | 1      | 9/8    | 0.248  |
| B4  | 4/5  | 8/9    | 8/9    | 1      | 0.28   |

$\lambda_{max} = 4.013$  
$CI = 0.00427$  
$CR = 0.00474$

Table 3. Judgment Matrix of Happiness Index on learning Status.

|     | C11  | C12  | C13  | C14  | C15  | Weight |
|-----|------|------|------|------|------|--------|
| C11 | 1    | 6/5  | 2    | 13/5 | 9/5  | 0.116  |
| C12 | 5/6  | 1    | 5/3  | 13/6 | 3/2  | 0.140  |
| C13 | 1/2  | 3/5  | 1    | 13/10| 9/10 | 0.233  |
| C14 | 5/13 | 6/13 | 10/13| 1    | 9/13 | 0.302  |
| C15 | 5/9  | 2/3  | 10/9 | 13/9 | 1    | 0.209  |

$\lambda_{max} = 5.024$  
$CI = 0.00592$  
$CR = 0.00529$
Table 4. Judgment Matrix of Happiness Index on Living Environment.

|     | C2 | C22 | C23 | C24 | C25 | Weight |
|-----|----|-----|-----|-----|-----|--------|
| C21 | 1  | 4/5 | 2/5 | 1/2 | 1/2 | 0.312  |
| C22 | 5/4| 1   | 1/2 | 5/8 | 5/8 | 0.250  |
| C23 | 5/2| 2   | 1   | 5/4 | 5/4 | 0.125  |
| C24 | 2  | 8/5 | 4/5 | 1   | 1   | 0.156  |
| C25 | 2  | 8/5 | 4/5 | 1   | 1   | 0.156  |

\[ \lambda_{max} = 5.031 \]

CI=0.00770  
CR=0.00690

Table 5. Judgment Matrix of Happiness Index on Interpersonal Relationships.

|     | C31 | C32 | C33 | C34 | C35 | Weight |
|-----|-----|-----|-----|-----|-----|--------|
| C31 | 1   | 5/11| 10/11| 7/11| 9/11| 0.262  |
| C32 | 11/5| 1   | 2   | 7/5 | 9/5 | 0.119  |
| C33 | 11/10| 1/2| 1   | 7/10| 9/10| 0.238  |
| C34 | 11/7| 5/7 | 10/7| 1   | 9/7 | 0.167  |
| C35 | 11/9| 5/9 | 10/9| 7/9 | 1   | 0.214  |

\[ \lambda_{max} = 5.062 \]

CI=0.01550  
CR=0.01390

Table 6. Judgment Matrix of Happiness Index on Self-value.

|     | C4 | C42 | C43 | C44 | C45 | Weight |
|-----|----|-----|-----|-----|-----|--------|
| C41 | 1  | 7/5 | 9/5 | 4/5 | 3/5 | 0.179  |
| C42 | 5/7| 1   | 9/7 | 4/7 | 3/7 | 0.250  |
| C43 | 5/9| 7/9 | 1   | 4/9 | 1/3 | 0.321  |
| C44 | 5/4| 7/4 | 9/4 | 1   | 3/4 | 0.143  |
| C45 | 5/3| 7/3 | 3   | 4/3 | 1   | 0.107  |

\[ \lambda_{max} = 5.010 \]

CI=0.00255  
CR=0.00228

**Calculate the Composite Weight and Consistency Check of Each Layer Element on the Target Layer**

It can be seen that the values of Weight, \( \lambda_{max} \), CI, and CR are calculated according to Table 2 to 6, as shown in Table 7 below.

|     | Weight i | \( \lambda_{max} \) | CI  | CR  |
|-----|----------|---------------------|-----|-----|
| Table 2 | 0.224, 0.248, 0.248, 0.280 | 4.013 | 0.00427 | 0.00474 |
| Table 3 | 0.116, 0.140, 0.233, 0.302, 0.209 | 5.024 | 0.00592 | 0.00529 |
| Table 4 | 0.312, 0.250, 0.125, 0.156, 0.156 | 5.031 | 0.00770 | 0.00690 |
| Table 5 | 0.262, 0.119, 0.238, 0.167, 0.214 | 5.062 | 0.01550 | 0.01390 |
| Table 6 | 0.179, 0.250, 0.321, 0.143, 0.107 | 5.010 | 0.00255 | 0.00228 |

It can be obtained that all the data vector values pass the consistency check. The constructed judgment matrix meets the requirements. And the feature vector values as data calculated from the weight are feasible.
Analysis of College Student Happiness Index

According to the weight value of criterion layer B, we can know that the influencing factors of happiness of college students are from high to low as follows: self-value, living environment, interpersonal relationships, and learning status. Of course, this does not mean that college student's happiness is not related to the learning status, but it means that in comparison, the student's satisfaction in learning is lower than in other aspects.

In terms of learning status, according to the weight value of the solution layer C1, the happiness of the college students in terms of learning situation can be obtained from high to low as follows: pay and return are in balance, high teaching / research level of teachers, can apply knowledge into practice (scientific research, internship), intense learning atmosphere, and good hardware facilities of learning. Scholarships are a good incentive for students which make them have a sense of accomplishment and inspire more enthusiasm for learning. However, schools need to pay attention to guide students to treat pay and return correctly, otherwise bad competition may be raised. Secondly, students are also very concerned about the teaching and academic levels of their teachers, and they are urged to learning enough knowledge in the university to face future competition. Therefore, the school should also strengthen the training of teachers in all aspects, conduct regular training, and provide funds for teachers to continuously increase their academic level and impart students more advanced knowledge. Thirdly, today's society puts too much emphasis on practical value, and concerns a lot about the immediate effects of studying. Affected by this, college students are also very anxious to hope that what they have learned can be immediately applied to society. When knowledge can be used practically in society, the happiness of learning raises, and college students have a more direct motivation to learn. Therefore, schools should also provide students with more opportunities for scientific research and internships to improve their ability and enhance their competitiveness in the market. This will not only reduce the student's anxiety in finding a job with satisfaction, but also allow students to truly use the knowledge they have learned in the future career.

In terms of the living environment, according to the weight value of the solution layer C2, the happiness of college students in the living environment can be obtained from high to low as follows: good physical health, good hardware facilities of campus life, excellent family economic conditions, advanced school education management and training models, and high-quality staff in school. Schools should pay more attention to the sanitation level of the campus and do good sanitation work for the school. If infectious diseases are found, infected person should be quarantined immediately and appropriate measures should be taken. At the same time, the school hospital should also do more notices and lectures on disease prevention to improve students' awareness of disease prevention and methods of treating diseases. Secondly, the convenience of school living facilities also greatly affects the happiness of students. If the living facilities of the school are not humanized, and campus life is not convenient, it will be difficult for students to accomplish anything in their studies, and this further reduces happiness senses.

In terms of interpersonal relationships, according to the weight value of the solution layer C3, the happiness of college students in interpersonal relationship can be obtained from high to low as follows: dormitory relationship, family relationship, love relationship, classmate relationship and relationship with teacher (mentor). Before allocating the dormitory, school can roughly look into individual's living habits, such as the time of getting up and going to bed, playing games or not, etc., to allocate the dormitory. In this way, when students face their roommates every day, they can get more harmony and improve everyone's happiness.

In terms of self-value, according to the weight value of solution layer C4, the happiness of college students in terms of self-worth is from high to low as follows: confidence in future career development, self-acceptance, can develop their hobbies, have a positive attitude toward life and can create value for society. If students have confidence in their future career development, they will have a lot of happiness and satisfaction in daily life. Although this is related to the individual's mentality, schools still need to try to create conditions and opportunities for college students to experience the happiness of using knowledge. Secondly, if the student is willing to accept himself with
self-satisfaction, he or she will probably have more inner peace for which school can organize some activities related to mental health, so that everyone can experience it, recognize the importance of themselves, and slowly accept the themselves from the bottom of the heart. It can greatly reduce the psychological stress and the possibility of depression in school students, thereby reducing the probability of mental illness that may harm themselves and others.

Summary

Through the analysis of this article, the happiness index of college students stems from physical and psychological health, from the realization of self-value, from the harmonious relationship of dormitories and families, from the confidence in future careers, and from self-acceptance. This paper analyzes the connotation and significance of improving the happiness index of college students. Based on the previous survey and questionnaire survey, a model of college students' happiness index based on AHP method is established, and quantitative analysis is performed to determine the weight of key index factors. This article puts forward constructive suggestions on how colleges and universities can improve students' happiness, which has important reference significance for building a harmonious and happy campus.

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