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Analysis of Health Education Network Psychological Guidance Examination Based on Big Data Background

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ABSTRACT

This article explores the analysis of online psychological guidance and examination in health education based on the background of big data. Firstly, the article provides an overview of big data technology's concept, characteristics, and basic principles, pointing out its widespread application in various fields, especially its potential in health education online psychological guidance and inspection. Then, the article provides a detailed introduction to constructing a health education network psychological guidance and inspection system based on big data, including data collection, data preprocessing, model construction, and model evaluation. Subsequently, by elaborating on the application examples of the system, the superiority of the system in improving inspection efficiency and accuracy was demonstrated. Finally, the article summarizes the advantages and disadvantages of online health education psychological guidance and examination systems based on big data, and it looks forward to future development.

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1. Introduction

21 Century is an age of unprecedented development. The rapid development of network technology, the convenient and rapid dissemination of information, more intense social competitions, and more frequent exchanges between people have made the whole world a true global village. Competition between countries depends on the cultivation of talent and the development of science and technology. Therefore, the new century has a higher demand for talents: talents should have excellent basic professional knowledge and skills and good psychological and moral qualities [1]. Mental health education should be suitable for the characteristics of contemporary college students' physical and mental

development, and the contents and methods of mental health education should cultivate good psychological quality of college students as purpose to enhance their ability to overcome difficulties and handle the crisis of college students [3]. Mental health education in colleges and universities should update their ideas and improve their own qualities to help students establish an awareness of mental health education so as to achieve personalized education, to establish a mental health protection mechanism for college students, and lay a solid foundation for the further development of mental health education in colleges and universities [4].

2. State of the Art

Although the era of big data has arrived, we haven't set up much data yet. Big data represents different meanings in different industries and people's eyes. However, the author believes that the concept of big data should be judged from the following three aspects. Firstly, big data should be a way of thinking. Secondly, big data can determine industry trends and strategy choices. The third aspect is the actual application of big data. Together, these three aspects constitute the meaning of big data [5]. In the era of big data, it seems that all the materials we create can be standardized and stored, and statistically applied to the actual work and life. For example, in public management applications, a large amount of data can help the government achieve comprehensive macro control and disaster warning, and so on [6]. Applying big data in these fields can improve work efficiency, reduce work costs, reduce environmental pollution and realize personalized service to some extent. Therefore, they are very popular with the broad masses. In other words, in the era of big data, with the data, everyone can achieve the scientific analysis of the data [7]. From a technical point of view, big data and cloud computing are indispensable, and they are related to each other. Big data can't be processed by a tablet computer, so it must be distributed by computers over large data mining and cloud storage [8].

At present, many factors, such as the personality disorder and emotional disorder, have hindered the comprehensive development of Chinese college students to a certain extent. Even some college students' psychological problems will lead them to the wrong road [9]. In the past, in the study of these problems, college-related personnel often used questionnaires or empirical research methods. Therefore, although a series of achievements were obtained, imperfect conclusions were created by many factors, such as the data analysis and sample selection to some extent [10]. In daily life, mental health educators tend to feel helpless, and the main reason for this phenomenon is the imperfect development of mental health education in institutions with higher learning levels [11]. In the era of big data, all projects have been implemented in data, and information technology has been combined with many disciplines. It can be seen that studying the psychological health of college students from the perspective of big data has become a major trend [12]. Therefore, under big data background, the study of mental health education in colleges and universities must be optimized and transformed. The courses of psychological guidance for college students are as follows.

3. Methodology

3.1. Data Processing Model Under the Background of Large Data

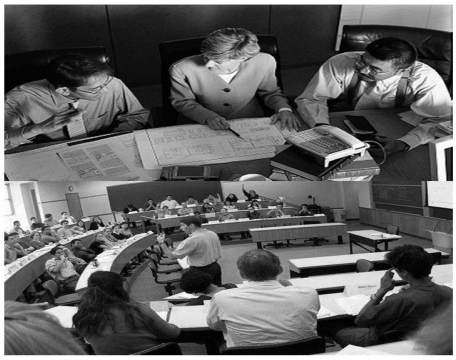

Figure 1. College students' psychological counseling

The construction of a computer data processing model for a large data era should proceed from the goal of data stability analysis, storage and mining. Firstly, data processing patterns of computer data in big data times need to be analyzed [13]. In the process of data analysis of multi-index problems, large data analysis can provide a good way to solve this multi-index problem [14]. The flow of large data processing is as follows:

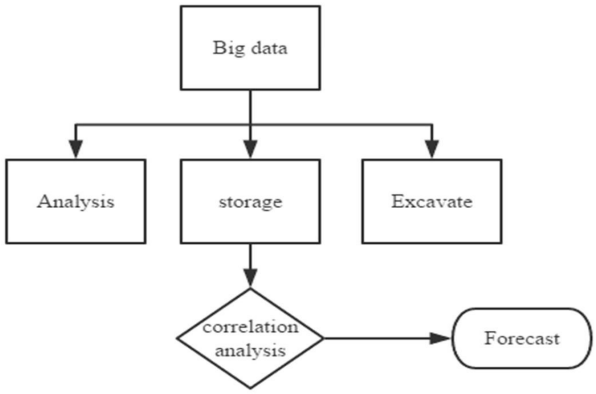

Figure 2. Large data processing flow

In addition, in the application of data processing technology in the era of big data, the data processing results need to be evaluated. In general, the effectiveness includes the effectiveness of content, standard (estimation of confidence intervals for pre-investigated data), and convergence and theory (ensuring the good convergence properties) [15]. The related formulas for verifying the convergence and T test are:

$$H(xi(t), xj((t) = \sum \left| xik(t) - xjk(t) \right| \tag{1}$$

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{\sqrt{(n_1 - 1)S^2{}_1} + (n_2 - 1)S_2{}^2}{n_1 + n_2 - 2}(\frac{1}{n_1} + \frac{1}{n_2})}} \tag{2}$$

3.2. A Survey of College Students' Psychological Status Based on the Eysenck Personality Inventory

The questionnaire was mainly used to evaluate the personality in this research. In this study, the Eysenck personality questionnaire contained 85 subjects divided into four sub-scales: P, E, N, and L. The primary purpose of the questionnaire was to investigate the introversion and extroversion (E), the spiritual quality (P), and emotion (N) of these three personality dimensions, as well as the personal camouflage (L). The correlation coefficient of scale was 0.87, and the internal consistency coefficient was 0.820. The E scale is a major measure of overt or covert trends; the N scale measures neuroticism or emotional stability; the P scale measures latent mental traits or personal stubbornness; and the L ratio is coverage or defense for testing. The score of these four scales can reflect the psychological situation of college students.

The questionnaire consisted of the internal and external aspects (E), the psychological quality (P), the neuroticism (N) and the shelter (L). The L scale was mainly the validity scale. The L scale can primarily determine the subject of human characterization, and it can simply measure the role of the subject. The scores of L can reflect the social cognition level of individuals to a certain extent. The E scale mainly measured introversion and extroversion. E's higher scores showed that individuals were outgoing and motivated. The N scale can test emotional stability, and higher scores can reflect unstable emotions. The P scale can test psychological quality. P's

higher scores indicated that individuals were more stubborn and found it difficult to adapt to the outside environment. The lower score of P suggested that individuals usually have a soft attitude and can better adapt to the environment. The test principles for the Eysenck personality questionnaire are as follows:

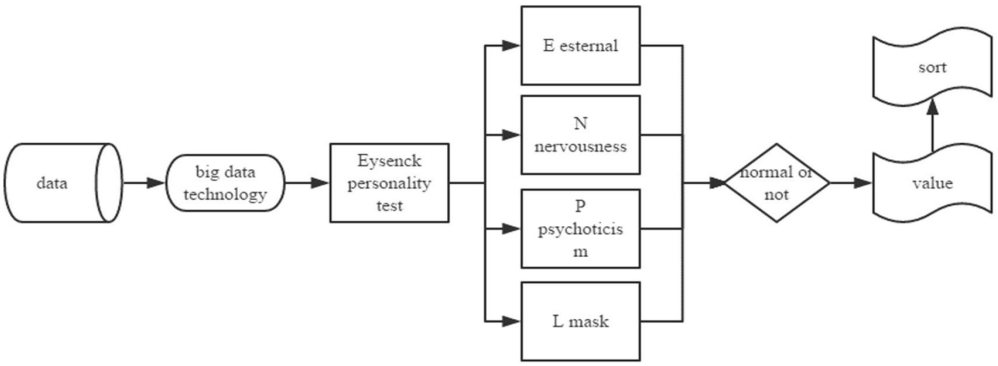

Figure 3. Eysenck personality questionnaire

3.3. Self-evaluation of College Students' Psychological Symptoms

The symptom checklist is a practical, simple and valuable scale for mental health status identification and group mental health examination. There are 90 items, and each project uses 5 grading systems (1-5) to assess whether the subjects have symptoms or the severity. 2: mild: mild symptoms, but there is no actual effect of subjects or slight influences; 3: moderate: conscious symptoms and symptoms have certain effects on the subjects; 4: serious: consciousness often has symptoms and considerable influences on the subjects; 5: quite serious: the frequency and intensity of awareness of the symptoms are very severe, and the influences of epilepsy are serious. Symptoms include 10 factors: somatisation, obsessive-compulsive symptoms, interpersonal sensitivity, e depression, anxiety, hostility, fear, paranoia, psychosis, and so on. In general, scores and total scores of nine factors can assess students' mental health.

4. Result Analysis and Discussion

4.1. Investigation and Analysis of the Results of Eysenck Personality Questionnaire

In this survey, the sociological data of the subjects were analyzed. The survey involved 6 institutions of higher learning at different levels, and 10396 freshmen were investigated. In the Eysenck personality inventory survey, 8553 valid questionnaires were collected, and the major subgroups of introversion (E), psychological quality (P), neuroticism (N) and concealment (L) were investigated. Among them, the average value±standard deviation was E=57.03±9.65; N= 49.38±10.39; P=42.73± 8.06; L= 50.66±8.58. 679 students showed abnormal mental status, accounting for 7.93%.

dimension	state	Number	Mean value	Std value	Std-error mean
E esternal	normal	7874	56.64	9.55	.11
	abnormal	679	61.51	9.72	.37
N nervousness	normal	7874	49.44	10.92	.12
	abnormal	679	48.70	11.50	.44
P psychoticism	normal	7874	42.59	8.02	.09
	abnormal	679	44.32	8.26	.31
L mask	normal	7874	50.78	8.69	.10
	abnormal	679	49.22	7.04	.27

Table 1. Comparison Between Normal and Abnormal Mean Scores of College Student Eysenck Personality Questionnaire

The overall comparison of the college students' Eysenck personality inventory (EPQ) shows that the F value was 0.445, and the concomitant probability was 0.505. It can be concluded that there was no significant difference between the average introversion and outward variance of college students. Then, the concomitant probability of the T statistic was 0. That is to say, there was a significant difference between the average value of college students' introversion and extroversion. In addition, from the point view of a 95% confidence interval of the mean difference of the sample, there was a significant difference between the internal and external averages of college students. Still, there was no significant difference between neuroticism, psychosis, and panic disorder.

4.2. Analysis of the Self-assessment Results of College Students' Psychological Symptoms

The symptom checklist (SCL-90) is a widely used psychometric instrument which is more rapid and effective than other methods. In the SCL-90 1-5 scoring system, the single item score was 2 points, indicating that the subjects did not feel very serious about the item. A single project score of 3 points or more can indicate that the subjects in the project are moderate or more serious. According to the survey of 10396 college students in six universities on the test list, the average score for one-way items was 32. Items with test rates from high to low are obsessive-compulsive disorder, paranoia, anxiety, depression, hostility, psychosis, horror and somatization.

Scl-90 factors	The average score ≥2			The average score ≥3		
	number	Percentage	sort	number	Percentage	sort
Somatization	748	7.2	9	71	0.7	9
Obsessive-compulsive symptoms	3477	33.4	1	377	3.6	1
Interpersonal sensitivity	2514	24.2	2	269	2.6	2
depressed	1548	14.9	5	181	1.7	3
anxious	1582	15.6	4	139	1.3	6
hostile	1471	14.1	6	164	1.6	4
terror	1078	10.4	8	102	1	7
Paranoid	1618	15.6	3	141	1.4	5
Psychotic	1150	11.1	7	84	0.8	8

Table 2. The result of College Students' psychological symptoms

According to the data in the table, through the large data check calculation, the detection rate of each item was above 10% except for the body outside, and the detection rate of obsessive-compulsive symptoms was as high as 33.4%. The average score was 33 points, and the top three relevance ratios were "the compulsion, the interpersonal sensitivity and the depression", with ratios of 3.6%, 2.6% and 1.7%, respectively. According to the number of positive factors, the psychological problems of college students mainly include compulsion, interpersonal sensitivity, depression and bigotry.

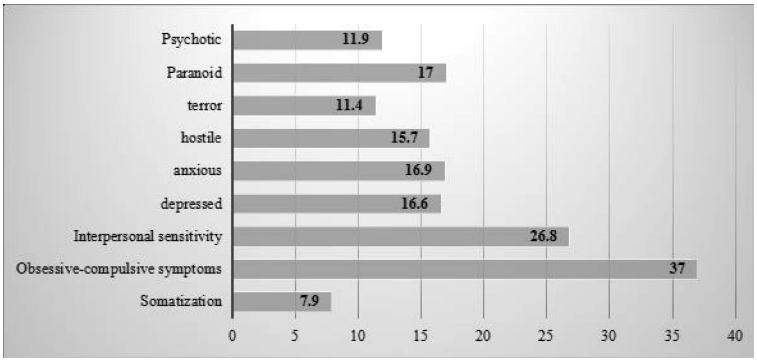

Figure 4. The proportion of College Students' psychological problems

As can be seen from the above figure, the proportion of college students' interpersonal sensitivity was 26.8%; the proportion of obsessive-compulsive disorder was 37%; the proportion of anxiety was 17%. These three kinds of psychological disorders had the highest proportion among college students, and interpersonal sensitivity is the premise of obsessive-compulsive disorder and anxiety. Therefore, interpersonal sensitivity is a major factor hindering the development of college students' mental health. Therefore, the mental health of college students must be improved and optimized. Using the correlation between large data to predict the future direction of things in psychological education in colleges and universities can effectively help college psychology education workers to understand the actual situation of the educational objects in time so as to achieve personalized education.

4.3. The Optimal Path of College Students' Psychological Health Education Under the Background of Big Data

In the era of big data, with the increasing university data, based on following the objective law of educational development, the full exploitation and utilization of the potential value of these data will greatly promote the psychological health education of college students. Under the background of big data, the principles of optimizing the psychological health education of college students are as follows: first of all, it is a people-oriented concept. In the era of big data, with the development of science and technology, human resource collection, process and use can realize the liberation of knowledge. The aim of all the development of science and technology is to serve people better. Secondly, the innovation of psychological health education must accord with the psychological conditions of college students' subjective values. In addition, colleges and universities should establish and improve the information collection and processing mechanism, as well as timely processing, classifying, and updating the big data for student files. Through the correlation data analysis, it was found that the relationship between the data variables can timely grasp each student's learning conditions, emotional changes, and living conditions and develop targeted educational programs according to the student's individual characteristics. In addition, colleges and universities should seize the public communication platform of the network, and establish a two-way interactive education mode on and off the line. In the virtual world of the Internet, people are more willing to talk about their true feelings. Therefore, colleges and universities can predict the real needs of every student by analyzing the big data, so as to develop teaching programs to meet the diverse needs of students. At the same time, college mental health educators can use the big data technology, learn from successful experiences in mental health education across the country, and improve the quality of them, so as to carry out mental health education better.

5. Conclusion

With the continuous development of technology and information technology in China, the contradiction between long-term data privacy and data management determines the choice of large data management methods and the range of data applications. Departments that manage data collection and processing must meet the standards of large data. In particular, for college students, their daily life and learning are easy to access to the network, and they produce more data. In the same environment, the mental health conditions of college students are different. In this paper, through the data processing model under the background of big data, the data processing confidence intervals and other parameters were determined. Then, the Eysenck personality survey and the self-evaluation of psychological symptoms of college students were carried out. The results show that there was a significant difference between college student's internal and external aspects and their psychological problems were mainly manifested in obsessive-compulsive disorder, interpersonal sensitivity, depression and paranoia. In the background of big data, optimising the path of college students' psychological health education must first uphold the people-oriented concept and reasonably use the mobile data of the network public communication platform to carry out the data analysis to guide the healthy growth of college students.

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