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Intelligent Analysis System for Ideological Guidance Education and Mental Health in Colleges and Universities Based on Big Data

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Abstract: With the development of the times and changes in society, the social environment faced by college students is constantly changing. Their own learning initiative, hobbies, academic performance, the expansion of the gap between the rich and the poor in the family, and the pressure of employment competition are all in the past. Different characteristics, the factors that induce their mental health problems also show more complex and diverse characteristics, Therefore, it is necessary to use a lot of data technology to conduct in-depth research on their mental health problems. This article aims to study the design and implementation of an intelligent BD-based mental health analysis system for colleges and universities(CAU). In this study, when analyzing the causes of mental health problems, a comprehensive use of various data and related analysis techniques for in-depth mining and analysis, to make the results of the analysis more logical and effective. This article first analyzes the basic principles of data mining and data warehousing in detail, group analysis methods, anomaly extraction methods, and correlation algorithms, and then designs an algorithm-based algorithm-based mining anomaly algorithm for fast data retrieval. At this point, students who may have mental health problems can be identified. Analysis of logic based on real data can provide a reliable basis for psychological teachers, thereby improving the efficiency and effectiveness of school psychological counseling. Experimental research results show that the system has the most accurate analysis of abnormal eating and sleep states, with 91.61%, and the lowest detection accuracy in psychotic abnormal states, with only 61.28%. In abnormal states such as depression, anxiety, paranoia, and horror, The test results are relatively accurate, about 80%. It is still necessary to strengthen the overall configuration and design of the system to maximize its value in practical applications.

1. Introduction

With the development of the times and social changes, the social environment faced by college students is also constantly changing [1-2]. They have different characteristics in their own learning initiative, hobbies, academic performance, the expansion of the gap between the rich and the poor in the family, and the pressure of employment competition. The factors that induce their mental health problems also show more complex and diverse characteristics[3-4]. Therefore, it is necessary to use BD technology to conduct in-depth research on their mental health problems [5-6]. At the same time, it greatly promotes the formation of our correct thoughts and beliefs, stimulates the experience of positive emotions, and the cultivation of moral behavior [7-8]. As long as we persevere, use our physical and mental strength, fully respect the differences of each subject, allow each individual to make independent choices, and fully develop their creativity, we will surely get out of the barriers of traditional ideological and political education[9-10].

In the research on the design and application of the ideological guidance education and mental health intelligent analysis system for (CAU) based on BD, many domestic and foreign scholars have conducted research on it and achieved good results. Al Mamun gave a data on the mental health of college students The design scheme of the mining system, the main method is to use ID3 algorithm to build a decision tree for classification mining, and use Apriori algorithm for association rule mining [11]. Hong S studies the mental health problems of vocational students. The main data mining algorithms used are the ID3 decision tree algorithm and the Apriori association rule algorithm to analyze a certain internal connection between psychological problems and their attributes [12].

In this study, when analyzing the causes of mental health problems, a comprehensive use of various data and related analysis techniques for in-depth mining and analysis, to make the results of the analysis more logical and effective. This article first analyzes the basic principles of data mining and data warehousing in detail, group analysis methods, anomaly extraction methods, and correlation algorithms, and then designs an algorithm-based algorithm-based mining anomaly algorithm for fast data retrieval. At this point, students who may have mental health problems can be identified. The analysis of logic based on real data can provide a reliable basis for psychological teachers, thus improving the effectiveness and efficiency of school psychological counseling.

2. Research on the Design and Application of the Intelligent Analysis System for Ideological Guidance Education and Mental Health in (CAU) Based on BD

2.1. Psychological Data Testing Technology for College Students

(1) Based on data mining algorithms

By collecting a large number of relevant data on the mental health of college students in our school, a complete mental health intelligent analysis system is established to reduce the pressure of mental health counselors and improve their work efficiency, which can actually improve college students with mental health problems. The combination of psychological problem analysis and data mining technology is to find hidden regularities in a small amount of data on mental health problems, which is a good way to improve the scientific nature of school mental health education by using advanced intelligent methods. This article introduces the related technology of data mining into the research of mental health problems, and develops the mental health intelligent analysis system of college students.

(2) Based on clustering method

The clustering process is correspondingly developed around this goal, such as how to measure the degree of dissimilarity and similarity between objects, what is the most appropriate number of clusters, how to deal with outliers, and so on. Whether from the perspective of machine learning or practical applications, cluster analysis is one of its main tasks. Obviously, cluster analysis occupies an important position in data analysis and has been applied to many fields. Scholars at home and abroad have done a lot of work and achieved remarkable results.

(3) Model-based approach

Model-based clustering algorithms try to find specific mathematical models to describe each cluster, and cluster them on this basis. Obviously, using this method of clustering is assuming that the given data set satisfies a certain probability of mathematical distribution. This method mainly includes statistical methods and neural network methods.

2.2. Function Module

(1) Data acquisition module

Student information registration: including student ID, student contact information, student gender, whether major is your choice, whether you are a rural child, whether you are an only child, degree of professional preference, etc. School Educational Affairs and Personnel Department: Obtain dynamic information of students, including family financial status, relationship status, performance fluctuations, etc.

(2) Data preprocessing module

Provide reliable, accurate and concise data sets for the mining process. For vacant values that appear, fill in with the average value. Data integration: Data integration is mainly to form specific data sets for different data mining processes or purposes. The data mining process targeted by this system mainly has two major blocks, one is anomaly mining algorithm based on clustering, and the other is processing by association rules. The data set is divided into two modules in order to mine the reasonable operation of the algorithm. Data specification: The data specification is the final operation of the data set based on the above two steps. In this system, the data set for anomaly mining analysis passes through the data cleaning and data specification. The ten factor score table is composed of only Just tidy up.

(3) Personal Information Center Module

Maintain basic personal information, and be responsible for the information management of each logged-in user. It mainly includes the functions of login password modification, personal data modification and personal diary writing.

(4) Public Information Center Module

Make the system functions more comprehensive, and make the work managed by the system more comprehensive during operation, including publishing articles, browsing articles, notification messages, online forums, etc. The public information center module includes the functions of publishing articles, browsing articles, notification information and online communication.

2.3. Application in Teaching

(1) Psychology knowledge course

Psychological education is a comprehensive and highly applied borderline science. Therefore, the establishment of basic courses and public courses such as psychology, psychometrics, psychological counseling, and abnormal psychology not only introduce psychology theories to teachers and students, but also help teachers learn and accumulate psychological knowledge in

practice. Learn from lessons, sum up experience, and accumulate experience. Help students gradually improve their self-cultivation and enhance their psychological and moral quality through the use of the psychological knowledge they have acquired. If our ideological and political education and moral development are based on the good psychological quality of students, it will indirectly bring about good effects of ideological and political education.

(2) Stage psychological education

College students already have strong self-study ability and self-education ability. Therefore, the current psychological education for college students should focus on mobilizing their enthusiasm and carrying out self-education, supplemented by psychological education lectures and psychological activities.

2.4. C4.5 Algorithm

The algorithm assumes that the training data set D is divided into k categories: $D_1, D_2, \cdots, D_K$. The total number of observations in the data set d, $d_i$is the number of observations in D_i, the probability formula for the sample belonging to the i-th category is as follows:

$$p_i = \frac{d_i}{d}(i - 1,2, \cdots, k) \tag{1}$$

The information expectation formula for data set classification is as follows:

$$\mathrm{I} = -\sum_{\mathrm{i}=1}^{\mathrm{k}} \mathrm{p_i} \log_2 \mathrm{p_i} \tag{2}$$

Let A be a certain attribute of the data set, the value is $a_1, a_2, \cdots, a_m$, and the information of each value expects the formula of $\mathrm{I}(\mathrm{A} = \mathrm{a_j}, \mathrm{J} = 1,2, \cdots, \mathrm{M})$ as follows:

$$\mathrm{I}(\mathrm{A} = \mathrm{a_j}) = -\sum_{\mathrm{i}=1}^{\mathrm{k}} \mathrm{p_{ij}} \log_2 \mathrm{p_{ij}} \tag{3}$$

3. Experimental Research on the Design and Application of the Intelligent Analysis System of Ideological Guidance Education and Mental Health in (CAU) Based on BD

3.1. Experimental Subjects and Methods

This experiment uses the college ideological counseling education and mental health intelligent analysis system as the experimental objects. Through the analysis of the overall detection accuracy of the system, the abnormal state of mental health is refined, and the detection accuracy of these abnormal states is analyzed. Through the method of actual investigation, the actual test of the system is carried out, and the experimental results are obtained.

3.2. Data Collection

The data of this experiment is obtained through the actual investigation of the group. According

to the assigned tasks, the test results of various indicators of the system are collected and recorded, and finally statistics and sorting are carried out to obtain the final experimental data.

4. The Design and Application Experiment Research Analysis of the Ideological Guidance Education and Mental Health Intelligent Analysis System in (CAU) Based on BD

4.1. Experimental Analysis of Mental Health Intelligent System

This experiment conducted experimental research on the ideological counseling education and mental health intelligent analysis systems of three different (CAU), and analyzed the average accuracy rates of various tests of these systems. The experimental results are shown in Table 1:

Table 1. Analysis of the average accuracy of each system

	Average accuracy
Mental Health Intelligent Analysis System A	78.29%
Mental Health Intelligent Analysis System B	83.54%
Mental Health Intelligent Analysis System C	81.67%

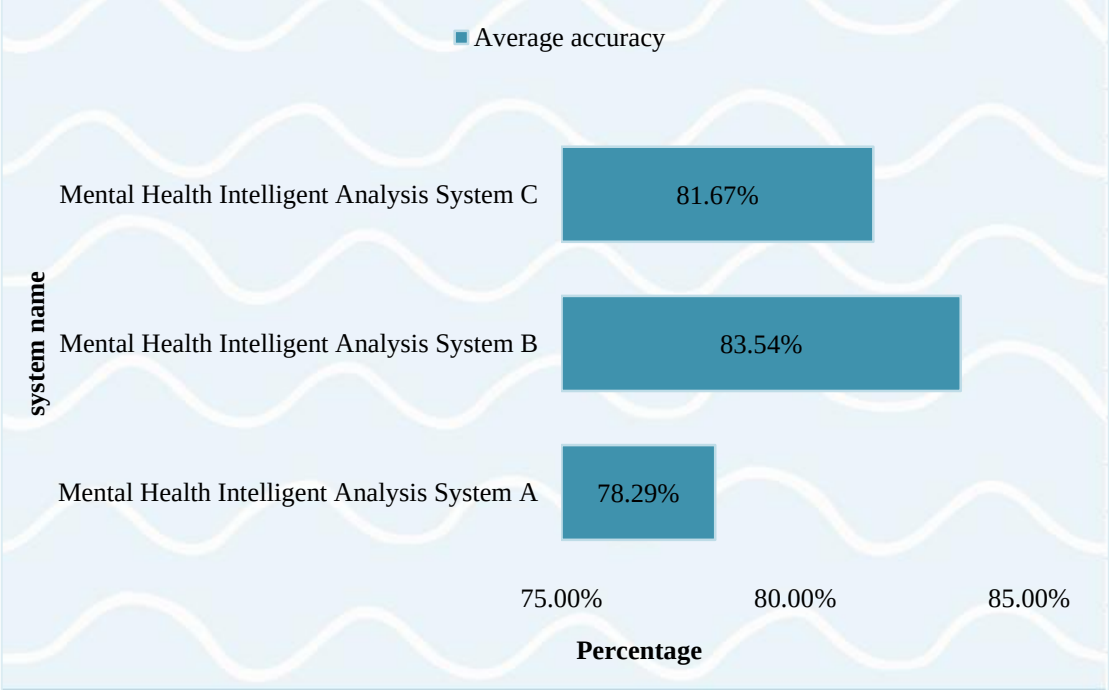

Figure 1. Analysis of the average accuracy of each system

As shown in Figure 1, the average detection accuracy of various psychological indicators of system B is the highest, with 83.54%. In general, the average accuracy of these systems is about

81%, and there is a lot of room for improvement.

4.2. Intelligent Analysis of Abnormal Mental Health Monitoring

In this experiment, the ideological counseling education and mental health intelligent analysis system of a university is used for experimental research, and the accuracy of the abnormal state of the students' mental health is analyzed through the system. The experimental research results are shown in Table 2:

Table 2. Mental health abnormality detection

	A mental health intelligent analysis system in a university
Depression	78.49%
Anxiety	87.32%
Paranoid	85.09%
Psychotic	61.28%
Terror	76.27%
Diet and sleep	91.61%

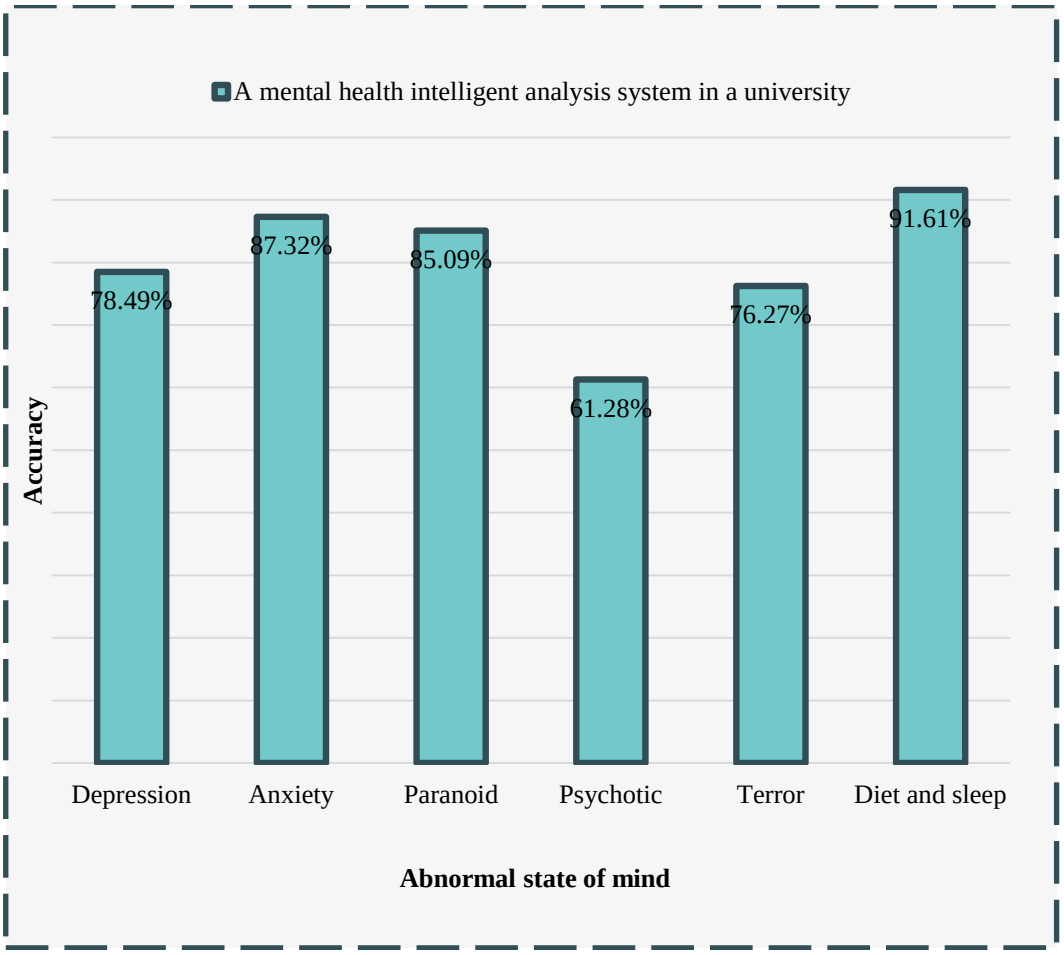

Figure 2. Mental health abnormality detection

As shown in Figure 2, the system has the most accurate analysis of abnormal eating and sleep states, which is 91.61%, and the detection accuracy of psychotic abnormal states is only 61.28%, in abnormal states such as depression, anxiety, paranoia, and horror. The test results are relatively accurate, about 80%. It is still necessary to strengthen the overall configuration and design of the system to maximize its value in practical applications.

5. Conclusion

With the development and progress of society, psychological quality has become more and more important. As the main force in the future of society and the country, students must have good psychological quality. This article uses it as a starting point to design a smart analytics system for college students to help psychologists deal with students' mental health problems. This paper designs an intelligent mental health analysis system for students based on the advice of a large number of data mining techniques used for mental health problems at home and abroad. This article makes a more in-depth and comprehensive analysis on the content of college students' mental health. In the process of testing and trial after the completion of the system, the system can realize the needs of college students' mental health education management through a unified access platform. All have reached the expected demand target. Combined with the design framework of the system, the process and functional logic of each sub-module are designed, and the realization from the system database table to the system user interface is completed, and the entire system is finally developed. And carry out the necessary maintenance and supervision of the information system at any time in a timely manner. The performance management function realized by this system is relatively simple. In the constantly enriched system, you can try to realize the function of deeper statistics and analysis.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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