

Research Article

Optimization of College Students' Mental Health Education Based on Improved Intelligent Recognition Model

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Paying attention to the mental health education of college students, optimizing the psychological quality of college students, and improving their mental health level are inevitable requirements of higher education facing the world. In recent years, the mental health education of college students has always been a hot issue in the education circle, which has attracted much attention. It is the main research purpose of this paper to correctly understand the problems existing in college students' mental health education and to find reasonable countermeasures and approaches to solve these problems. This paper collects and organizes the dimension facts twice, conducts descriptive analysis, unbiased pattern *t*-test, chi-square test, variance evaluation, and SNK-q check on the legitimate data, and analyzes the change and impact of the mental health level of students with negative psychological symptoms after 2 years. We use machine learning methods to model and analyze susceptibility factors. Among the psychological susceptibility factors, the UPI scores of students with negative psychological symptoms with different levels of self-esteem, psychological resilience, depressive cognition, positive coping style, negative coping style, different family functions, and ability to perceive social support have significant differences. The mental health level of college students with negative psychological symptoms decreased after 2 years. The self-esteem stage decreased, and the psychological elasticity stage decreased; the longer the cognitive stage of depression, the worse the coping style; the more serious the impairment of family function, the lower the possibility of social support, the more likely it is to lead to psychological problems. After preprocessing the original data, the features of various types of information of the intelligent model are extracted. The test and data analysis results show that the improved recognition accuracy based on the intelligent model is 82.5%, which is higher than the traditional model, which proves the effectiveness and feasibility of the scheme. Using item or dimension data, the model established by machine learning method based on susceptibility factors can effectively predict the changes of mental health of college students with negative psychological symptoms after 2 years, and can effectively identify college students with psychological problems after 2 years.

1. Introduction

With the continuous development of science and technology, today's society puts forward higher and higher requirements for talents. College students are important human resources in China and play an important role in promoting economic and social development. Facing increasingly fierce international and domestic competition, contemporary college students have mental health problems, which are characterized by universality, concealment, and socialization [1]. College students have great changes in their own physiological and psychological

activities and often have a more negative emotional experience, and their ability of self-regulation and self-control is not strong. Therefore, when dealing with problems such as learning, social networking, friendship, and love, they often cause fierce conflicts of psychological contradictions, resulting in imbalance and imbalance in psychological development [2]. If psychological factors affect its development in all aspects, it will lead to serious consequences [3]. This problem has become the focus of society and research scholars and an urgent problem to be solved and optimized in colleges and universities.

The traditional model is relatively passive and lacks accuracy. People need to take the initiative to consult a psychologist and test to determine whether they have a disease. The main diagnosis and treatment methods used by doctors are communication and questionnaire [4]. The diagnosis results are different due to the influence of doctors' subjective judgment [5]. It is worth noting that the effect of traditional mental health monitoring methods on the prevention of mental health diseases greatly depends on people's attention, and there is no appropriate biomarker to quantify the degree of development of mental diseases and the effect of drugs. Combining mental health education with related technologies to build an education model based on the intelligent model will be more conducive to college students' self-troubleshooting of psychological problems, realizing the autonomy of the education process, the digitization of the test model, the intelligence of the test method, and so on.

The combination of psychological problem analysis and intelligent model is to explore the hidden regularity in a small amount of data of mental health problems, which is a good means to promote its learning by using advanced intelligent means. In this paper, an improved prediction method based on the intelligent model is established to make mental health education more targeted, so as to improve the level and efficiency of work, and provide a basis for the planning and decision-making of mental health education in colleges and universities.

The organizational structure of this paper is as follows: Section 1 briefly introduces the background, significance, and main work of college students' mental health research. Related work is discussed in Section 2. Section 3 describes the improvement and optimization based on the intelligent model and introduces its implementation steps and the embodiment of intelligence in detail. In Section 4, the improvement of the mental health education intelligent model is simulated and tested. Experimental analysis and discussion are carried out in Section 5. Section 6 summarizes the work of this paper and the exploration of future research directions.

2. Related Work

At present, the domestic literature on the use of data mining technology to study the mental health problems of college students is still less, and from the literature published on this topic, the research in this direction is still superficial, and the level of published papers is low. In recent years, relevant research mainly includes the following aspects.

Theoretically, most of them use the traditional classification and correlation analysis methods to study mental health problems. However, classification and counting need to know the category of data in advance. However, in practice, we cannot know which of the following freshmen have mental health problems, so it is very difficult to obtain class labels in advance [6]. In addition, the number of students with information health problems is a minority compared with the overall total number, which can be classified as abnormalities [7]. The use of anomaly detection

technology has a better effect on finding these individuals. Finding out the related factors affecting the problem is a very meaningful problem. Through correlation analysis technology, we can find the frequent patterns and association rules of psychological problems, understand the causes of the problem from a deeper level, and eliminate the hidden dangers [8].

Relevant researchers give the design scheme. The main method is classification mining and association rules mining with an apriorism algorithm [9]. From this article, we can see that there is good background knowledge of psychological research, but the data used are only obtained through the mental health test questionnaire, and the research object is only the students of a grade in all schools of the author [10]. Moreover, the literature is not deep enough for the mastery of technology and experimental tests. The main data mining algorithm is apriorism association rule algorithm, which analyzes the internal relationship between psychological problems and their attributes [11]. In addition, this paper additionally researches the multidimensional records warehouse mannequin of psychological facts evaluation of greater vocational students and designs a prototype gadget with VB. From the literature, its work is more systematic and comprehensive, but its biggest deficiency is that it does not analyze the results of data mining, so it does not summarize regular knowledge. Therefore, the literature only studies a technical means and does not give the knowledge and guiding conclusions of higher vocational students' mental health problems at a deeper level [12].

There are many literatures abroad that apply data mining technology to the research of this problem. Among them, scholars explore the effects of genetic and environmental factors on mental health problems in order to provide useful information for the prevention and treatment of mental diseases [13]. Based on the traits and benefits of community surroundings and its influence on university students' intellectual fitness schooling [14], this paper discusses the relevant strategies of using network advantages to strengthen college students' mental health education and specifically expounds on the organization construction strategy, teacher training strategy, approach, resource optimization strategy, network service strategy, curriculum teaching strategy, knowledge acquisition strategy, independent maintenance strategy, and so on.

3. Relevant Knowledge of Intelligent Model

The model of mental health education is a brief description of the process and organizational form of mental health education under the guidance of corresponding ideas. It is the product of the combination of mental health education theory and practice. It is the intermediary link and bridge of the application of mental health education theory to mental health education practice.

3.1. Construction Principles of Traditional Education Model. In the actual process of college students' mental health education, in addition to following the basic principles of

college students' mental health education, the following principles should also be highlighted:

- (1) The principle of subjectivity. It mainly means that in the process of education, we should take students as the main body of understanding and development, fully mobilize students' enthusiasm and initiative to participate in activities, and give full play to their initiative [15]. Various forms of mental health education must act on the main body in order to produce results, fully respect each student's personality and development potential, and enhance their use of the network ability of self-education that should enable college students to actively participate in various mental health education activities as the main body and constantly deepen their understanding of themselves.
- (2) The principle of interactivity. Activities based on the network environment should follow the principle of interactivity. When educators carry out activities through the network, they should not only provide various information resources such as mental health, psychological testing, and psychological training but also fully strengthen the interaction between man and machine and give timely feedback to students' help [16]. In addition, when helping students solve problems, they should advocate humanized service, in order to let students feel the human care behind the network, we need to constantly strengthen the construction of the network itself and enhance their concept of rights and obligations in cyberspace. While carrying out computer and network knowledge education for college students, we should strengthen the education on computer network laws and regulations, let students realize the harmfulness of network illegal and criminal acts, and consciously abide by various network laws and regulations [17]. While requiring college students to consciously abide by the law, we should cultivate their awareness and ability of online self-protection, improve their ability to identify network traps, and safeguard their legitimate rights and interests in the network world.
- (3) The principle of mutual assistance. Students can help each other and grow together by exchanging various experiences, revealing their feelings, and helping each other make suggestions through the network. Because college students have an identical identity and comparable age, and some even have frequent experience, they are less complicated to open their hearts and hear to every other's opinions, which is very vital to students' psychology improvement that may additionally have surprising effects. Lectures and reports on mental health education are also one of the main activities of mental health education. Colleges and universities should give full play to the advantages of the network, integrate educational resources, regularly upload special lectures and reports closely related to college students' mental health, and consciously guide students to watch the

video and audio materials of mental health teachers uploaded by other schools when conditions are not available, to further strengthen the mental health education of students [18].

- (4) The principle of complementarity. In the process of carrying out the work, we should organically combine the two to realize their complementary advantages and improve the effectiveness of the work. This method has many incomparable advantages, but there are also many shortcomings, such as some psychotherapy technologies cannot be carried out through the network, man-machine communication limits people's perception experience, many psychological obstacles cannot be solved only solved by methods, and so on. The traditional questionnaire survey is more time-consuming and laborious, whether it is distributed and recovered, or the data statistics after recovery; the psychological survey through the network is more convenient and rapid. Students are only required to log in to a website in a certain period of time, fill in, and submit the questionnaire online, which also facilitates the later data statistics and analysis. Through the psychological investigation of college students through the network, we can scientifically determine the characteristics and types of college students' psychological problems, so as to provide a certain basis for the development of mental health education in colleges and universities

3.2. Intelligent Model of Mental Health Analysis. This paper studies the intelligent mental health analysis method. The mental health of college students is divided into five dimensions: anxiety, depression, fear, paranoia, and hostility. The intelligent mental health analysis method is mainly to build an intelligent mental health analysis model. The specific framework of the model is shown in Figure 1. The model focuses on the monitoring of mental health and the prediction of mental diseases [19]. Relying on intelligent devices as the operation platform and data source, the user behaviour information is deeply analyzed through the user's heartbeat rate and motion data. Through the information mining of multimodal data, the changes in the user's mental state can be detected in all aspects, so as to better prevent the occurrence of mental diseases.

In order to establish an all-round and intelligent evaluation model, the original data set is constructed by collecting heart rate, social text, and other information, and the features are extracted. Then, multifeature fusion is used to further reduce the dimension of the feature vector. Finally, the fused feature vector is used as training sample data to optimize the model parameters. For the classification of intellectual health, the random woodland algorithm is used. When the awareness accuracy of the mannequin meets the threshold, it indicates that the mannequin parameters have been educated and can be used to confirm the correctness of the viewing mode data. Random forest algorithm guarantees the diversity of models by multiple random sampling to avoid

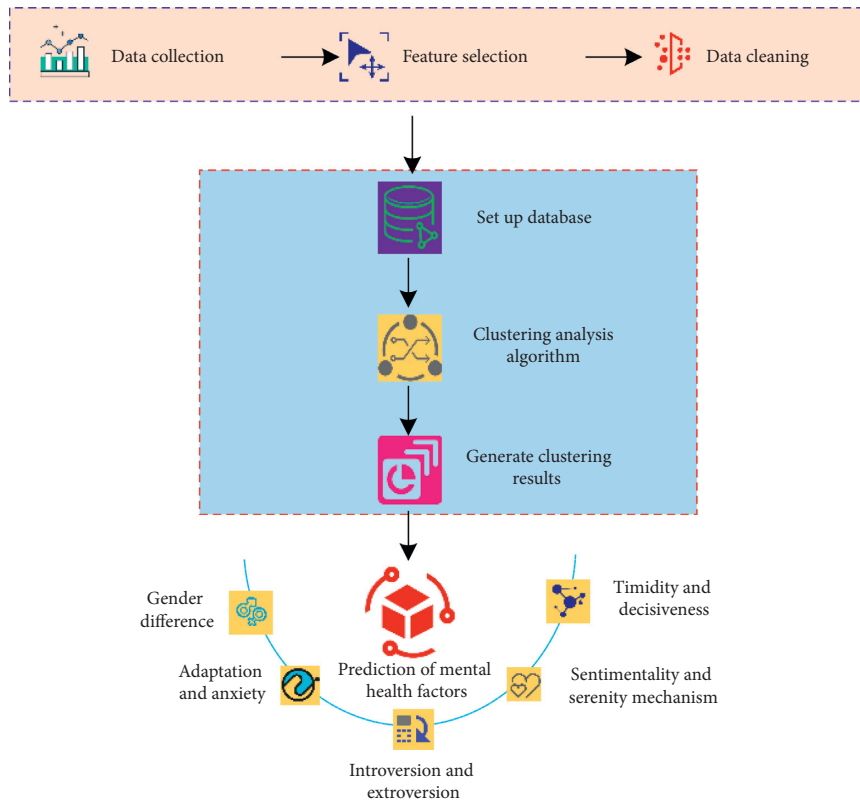


FIGURE 1: Model framework of intelligent mental health education for college students.

supersaturation; at the same time, the sampling information is input into multiple classifiers to improve the complexity of the model.

3.3. Mental Health Education Information Push Process.

Use the cloud services deployed on the cloud computing platform to realize the massive data storage, services, and computing in the platform. The platform sets up the psychological crisis early warning database of colleges and universities and establishes the psychological crisis early warning database of the cloud-computing layer according to the mental health index system [20]. The database collects the psychological crisis intervention mechanism and key factors endangering college students, including a large number of psychological crisis index systems. The platform evaluates the user's psychological state according to the psychological crisis index system. When the evaluation result is dangerous, the platform needs to send a crisis early warning to the relevant person in charge in time. The relevant person in charge will implement psychological intervention and treatment to the user according to the received results to avoid the user's psychological crisis.

The online service platform of cloud computing technology includes hardware facilities and software facilities, which are deployed through application services and data centres. Cloud computing of massive mental health data is realized through the data centre. The data centre is composed of storage devices and servers, and the platform distributes virtual computers to all users. Its frame is shown in Figure 2.

According to Figure 2, the platform deployment framework realizes the cloud storage, data calculation, and information push of mental health data centre. The platform administrator sets different push contents for different university users through the information push module and cloud computing technologies such as the parallel apriorism algorithm. The push results are sent to the platform users through the information receiving agent through the virtual machine. The platform monitors the user's login status in real time, so as to send push information in time.

3.4. Function Realization of Intelligent Mental Health Education Model.

The web-based college intelligent psychological test platform is composed of five interrelated management systems: student test system, psychological file management system, database management system, intelligent analysis system, and psychological teacher management system. Its structure is shown in Figure 3. When students register and log in for the first time, the system will automatically create personal psychological files for students. Students can choose the corresponding psychological scale for measurement. The scale comes from various standard psychological scales uploaded by psychological teachers or selected in the system. The results of students' measurements are stored in the database and processed by the intelligent analysis system to form analysis reports and mental health levels, which are fed back to students and stored in the database. At the same time, by logging in to the psychological teacher management subsystem, psychological teachers can timely view the students' evaluation

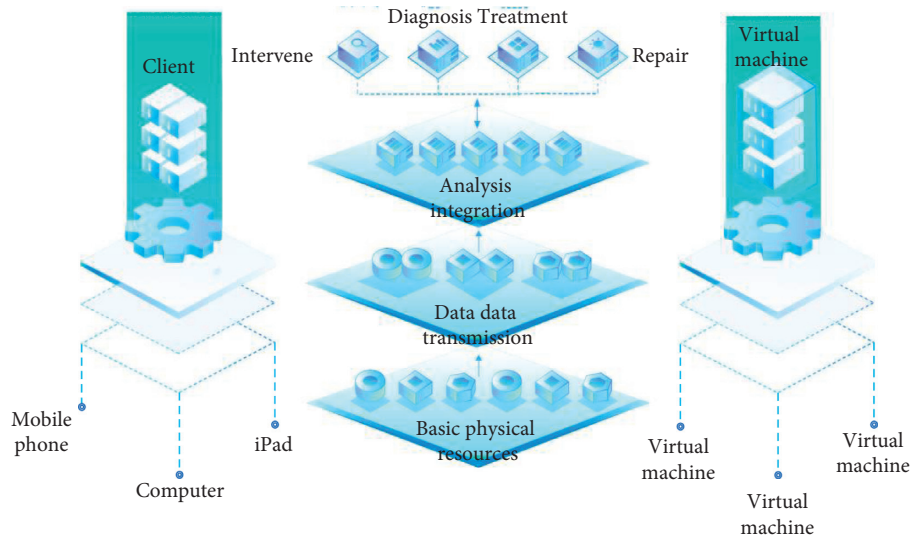


FIGURE 2: The deployment framework of the cloud computing platform.

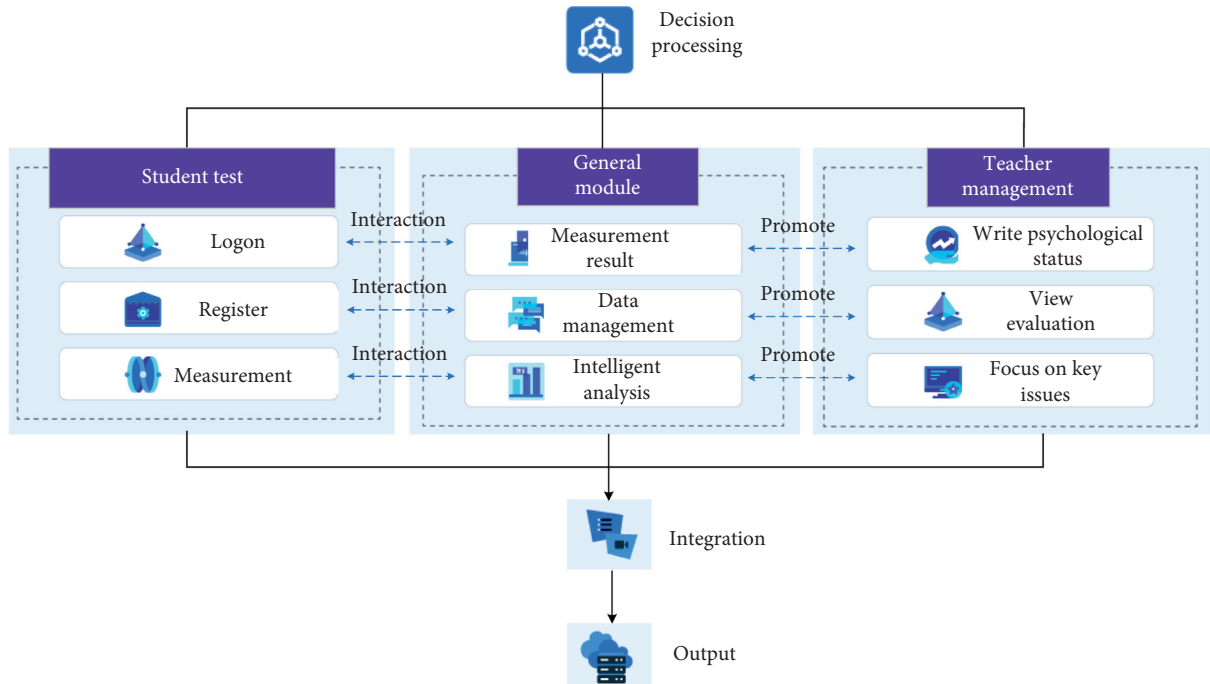


FIGURE 3: Function realization of intelligent mental health education model.

results, pay attention to the students with serious test results, and make corresponding decisions [21].

Because people’s psychological problems are complex, relying on the traditional decision support system to analyze the psychological scale with fuzzy logic can only reflect one side of the problem. Therefore, the platform combines a decision support system and an expert system to form an intelligent analysis system to comprehensively and accurately analyze students’ psychological problems. Among them, the inference engine is the component of knowledge-based reasoning in the expert system, which is realized in computer, mainly including reasoning and control; knowledge base has the functions of knowledge storage,

retrieval, arrangement, addition, deletion, modification, and expansion [22]. In the knowledge base management module, psychological experts and knowledge engineers cooperate to manage the writing and updating of knowledge. The database contains the user’s basic files, the completed scales, the results of the questionnaire, and the solutions and suggestions to various psychological problems [23].

4. Simulation Test of Intelligent Model

In order to test the effectiveness of the improved mental health service based on the intelligent model, the comparison results of the execution time of the platform with

different number of devices are shown in Figure 4. In order to visually show the operation performance of the platform, the platform is compared with the personalized platform and the new media technology platform. The execution time of the platform decreases with the increase of the number of devices; the execution time of a personalized platform and a new media technology platform increases with the increase of the number of devices. The platform test results show that the performance improvement of the platform in this paper is more obvious when there are more devices. The main reason is that the platform is built by using cloud computing technology. By mining massive cloud data, cloud computing technology has parallel computing performance and effectively improves the scalability of the platform.

The statistical results of students' experience are shown in Figure 5. A total of 88.4% of the students believed that using the platform would help them accurately locate their mental health; 90.1% of the students thought that using the platform could clarify the problems affecting mental health, help them make adjustments to specific mental health problems; and more than 90% of users believe that the platform can evaluate users' psychological state through a reasonable mental health index system. The platform has high effectiveness of mental health services, and the platform helps users further understand their mental health. Users use the platform to communicate well with psychological counsellors and can obtain ideal psychological adjustment effects by consulting with psychological counsellors. The survey results effectively verify that the platform is highly effective and can provide users with good mental health services.

To further verify users' satisfaction with using the platform, the survey results are shown in Figure 6. Most users are satisfied with various evaluation indicators such as platform convenience, feedback speed, response speed, and rationality. Only less than 2% of users are dissatisfied with the evaluation results of indicators such as interface setting and information utilization. The main reason is that the survey results are subjective evaluation results, and personal subjective consciousness accounts for the main part of the evaluation.

5. Results and Analysis

5.1. Comparison of Experimental Results of Different Models. As for the mental health level of college students, the detection results of intelligent and traditional modes are compared. Comparison of difference significance test under different modes is shown in Figure 7.

The result is that in the experimental test of students in different modes, the mean value of each factor, and the pretest factors and post-test factors in the traditional mode are not significant. However, there are very significant differences between the test factors in the traditional mode and the improved mode and the pre- and post-test results in the improved mode. This shows that there is no significant difference in the mean value of each factor before the experiment between the traditional mode and the improved mode. After a semester of mental

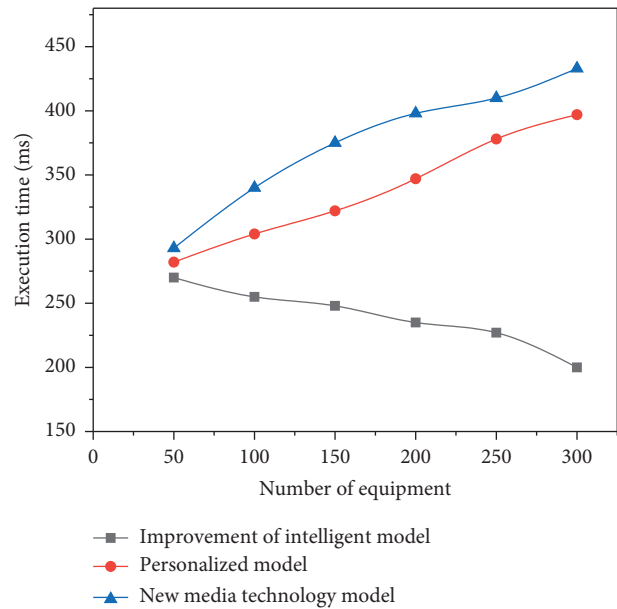


FIGURE 4: Comparison of model execution time with different number of equipment.

health education course, the students in the improved mode are significantly better than those in the traditional mode in terms of self-control, self-maturity, suspicion and delusion, guilt, and impulsive tension. That is, in terms of self-control, students in the improvement mode can reasonably control their feelings and actions and have a strict self-discipline and strong self-esteem. In terms of self-maturity, the students in the improvement mode are more stable and mature, can face the reality, and have less psychological problems. In terms of suspicion and paranoia, he can trust others, is not suspicious, is easy-going, is considerate, can get along well with others, and adapt to it well. In terms of guilt, they are less pessimistic, depressed, and uneasy. In terms of impulsive tension, it is generally calm and stable; the interpersonal relationship is handled well; the psychology is generally balanced; and it will adjust itself in time when it is unbalanced.

5.2. Comparison of Results before and after Education under the Improved Model

5.2.1. Comparison of Students' Experimental Results before and after Experiment under All Improved Modes. The mean value of each factor before and after the experiment and the number of students with psychological problems in the mental health diagnostic test are compared. The results are shown in Figure 8.

Figure 8 shows that in the CAS test before and after the experiment in the improved mode, except for the insignificant difference in suspicion and delusion, the other factors have reached a very significant change level. It shows that students in the improved mode have significantly improved their self-control, self-maturity, guilt, impulsive tension, and so on. However, in terms of suspicion and

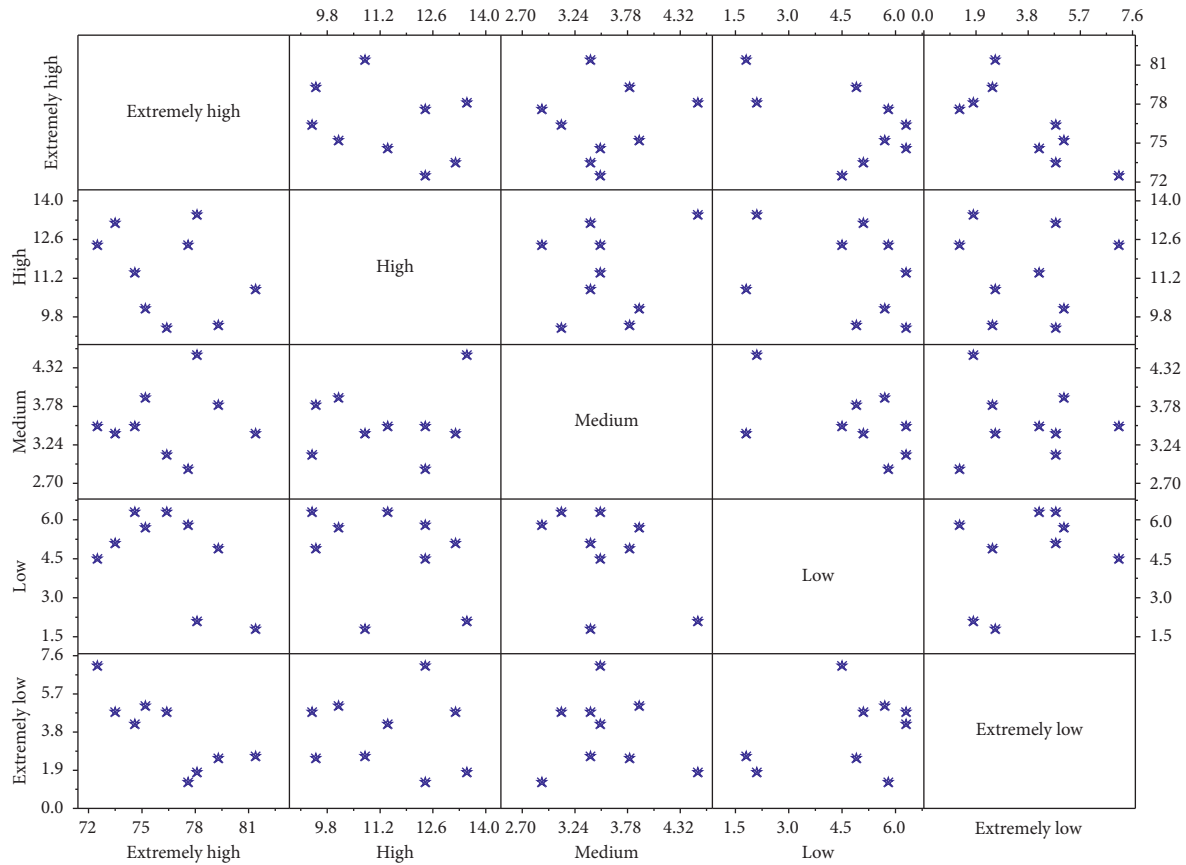


FIGURE 5: Survey results of college students' feelings.

delusion, the changes of students after the experiment under the improved mode are not obvious. The reason may be that the mastery cycle of interpersonal skills is long, and it is difficult to improve significantly in the short term. It needs continuous exercise, experience, and accumulation in communication practice to be effective.

Figure 9 shows that the number of students with psychological problems decreased significantly before and after the experiment in the improved mode, reaching a statistically significant level. In terms of the total table, the number of students with mild psychological problems decreased by 9 after the experiment, and the number of students with more serious psychological problems decreased by 5 after the experiment. In terms of the change of each factor, the students with mild psychological problems, the number of people decreased after the experiment, and the significant changes of the investigated factors are self-control and guilt. Among the students with more serious psychological problems, the number of students decreased after the experiment, and the change reached a significant level only in impulsive tension. The above results show that mental health education is more effective in improving students' mental health levels and dredging mild mental problems, but the effect on serious mental problems has not reached the statistically significant level in this experiment. The reasons for the emergence of serious psychological problems are very

complex. I'm afraid it's difficult to solve the problems only through one semester of health education, which needs to be further discussed in the future.

5.2.2. Comparison of Test Standard Scores of Students before and after Mental Health Education under Different Department Improvement Modes. Although after a semester of mental health education courses and auxiliary measures, students have improved significantly under the improvement mode, there are individual differences between arts and sciences and between different departments, as shown in Figure 10.

It is not difficult to see from Figure 10 that the decrease in the number of students with psychological problems in science is greater than that in liberal arts, that is, the situation of liberal arts students is not as ideal as that of science students, and the education of liberal arts students should be strengthened. The focus of liberal arts students' education should be impulsive tension, that is, to cultivate students to be calm and stable in the face of tension, deal with interpersonal relations well, and learn to adjust themselves in time in case of psychological imbalance. The focus of science education should be on self-maturity, that is, to cultivate students' emotional stability, face reality, and reduce psychological distress. As far as different departments are

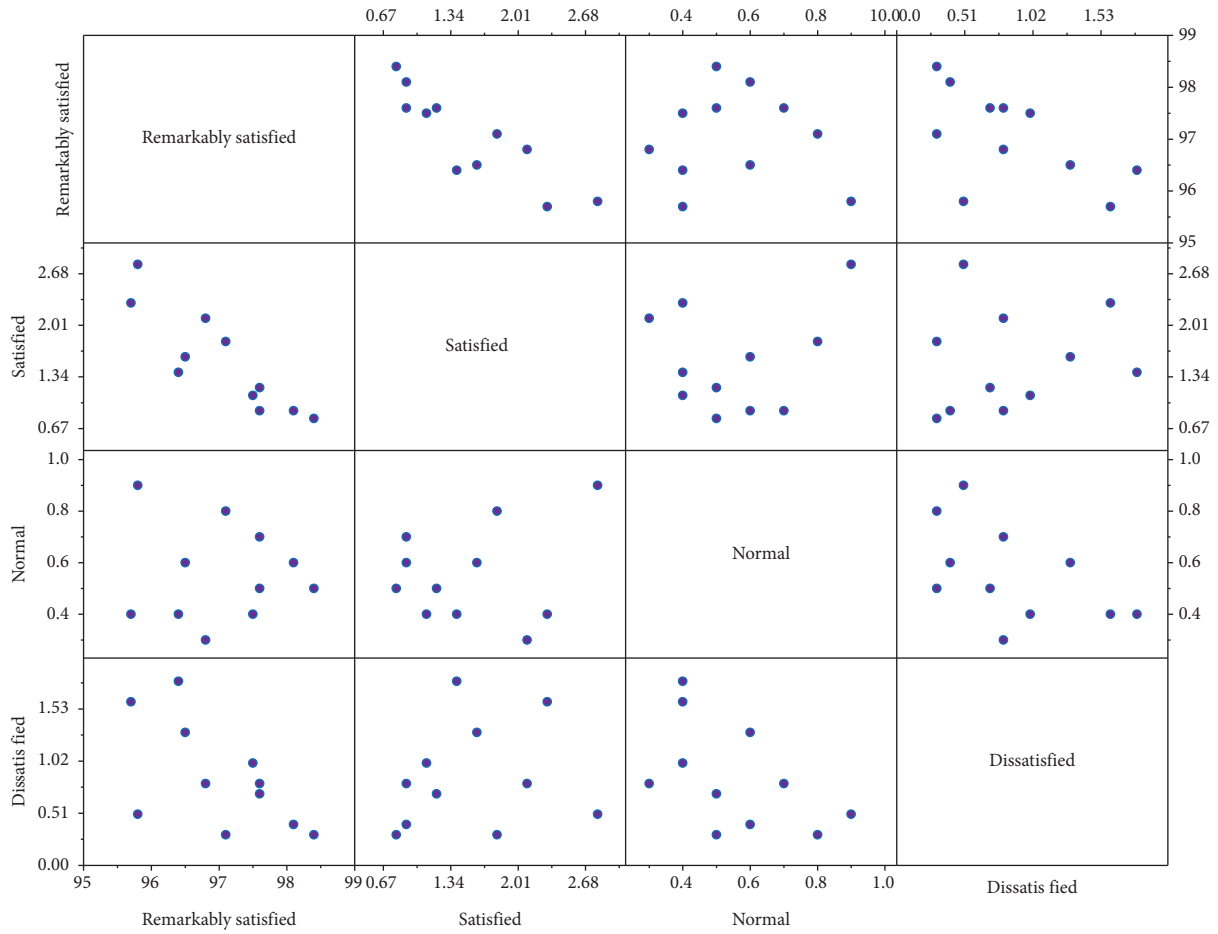


FIGURE 6: Survey of model use satisfaction.

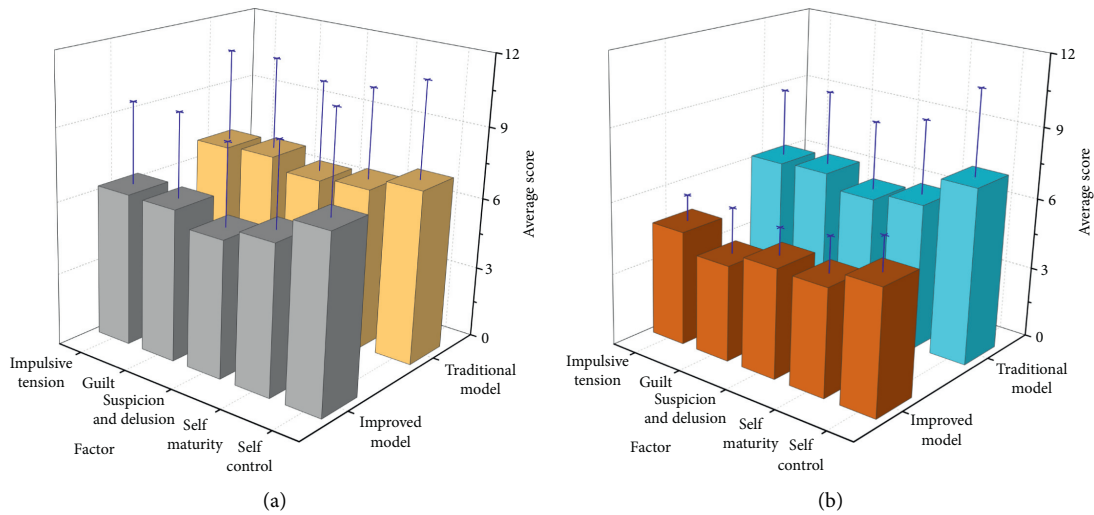


FIGURE 7: Comparison of difference significance test under different modes: (a) comparison of different models before the experiment and (b) comparison of different models after the experiment.

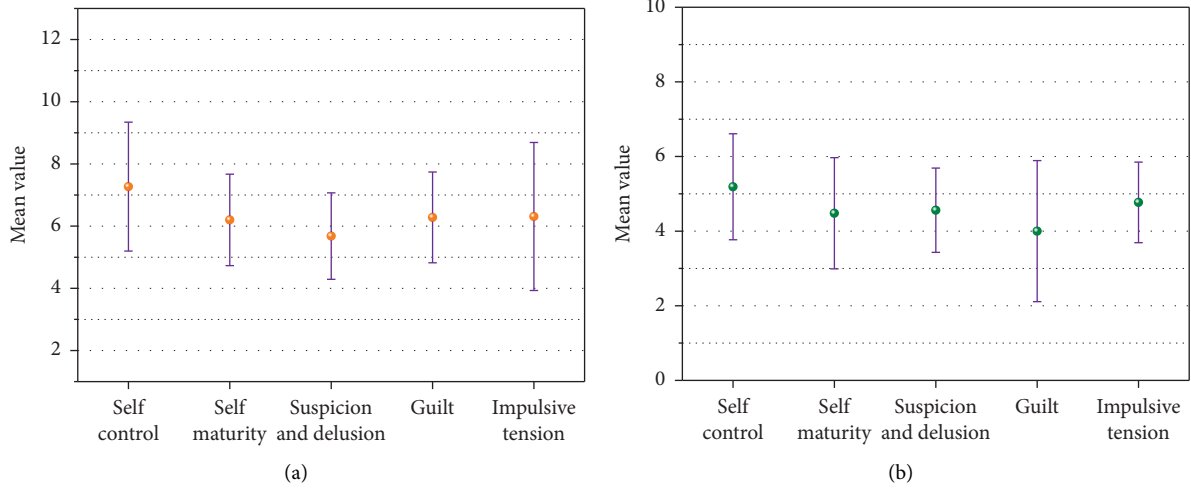


FIGURE 8: Comparison of mean values of students' factors before and after experiment under all improved modes: (a) comparison of mean values of various factors before the experiment and (b) comparison of mean values of various factors after the experiment.

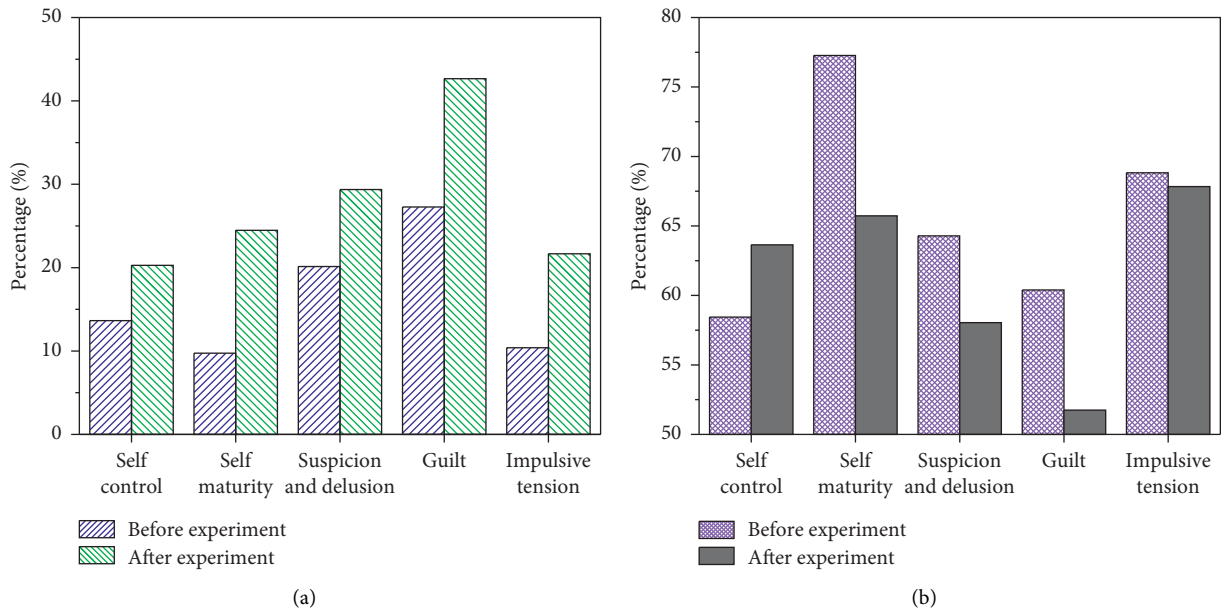


FIGURE 9: Continued.

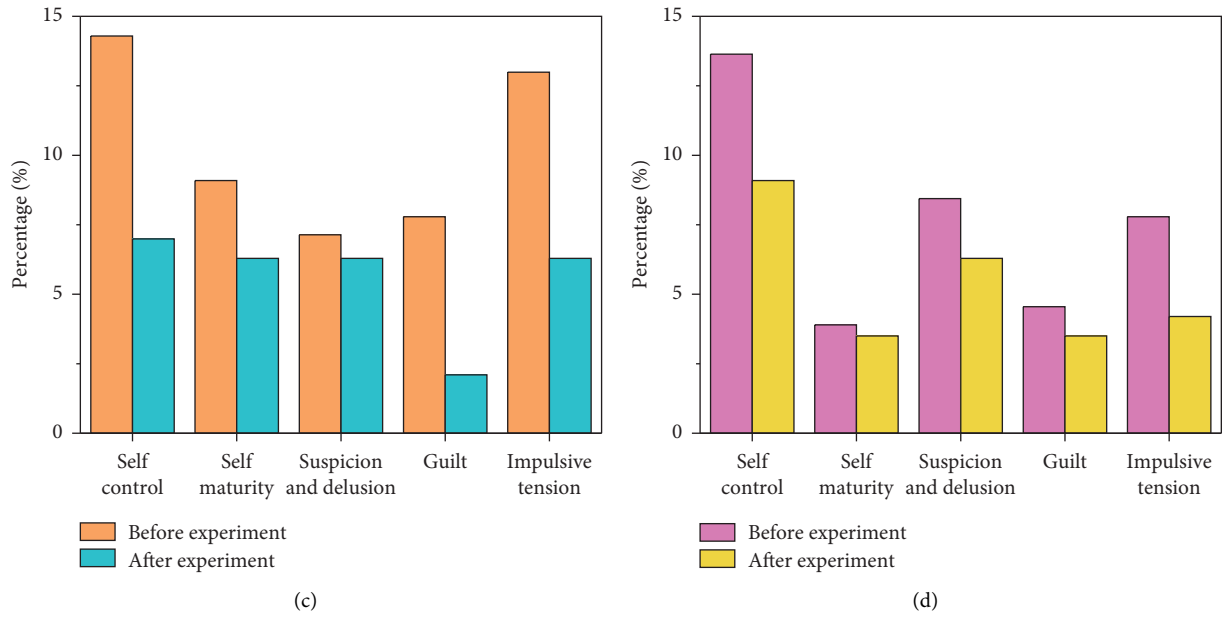


FIGURE 9: Comparison of CAS test distribution before and after the experiment in improved mode: (a) standard score ranged from 1 to 3, (b) standard score ranged from 4 to 6, (c) standard score is 7, and (d) standard score ranged from 8 to 10.

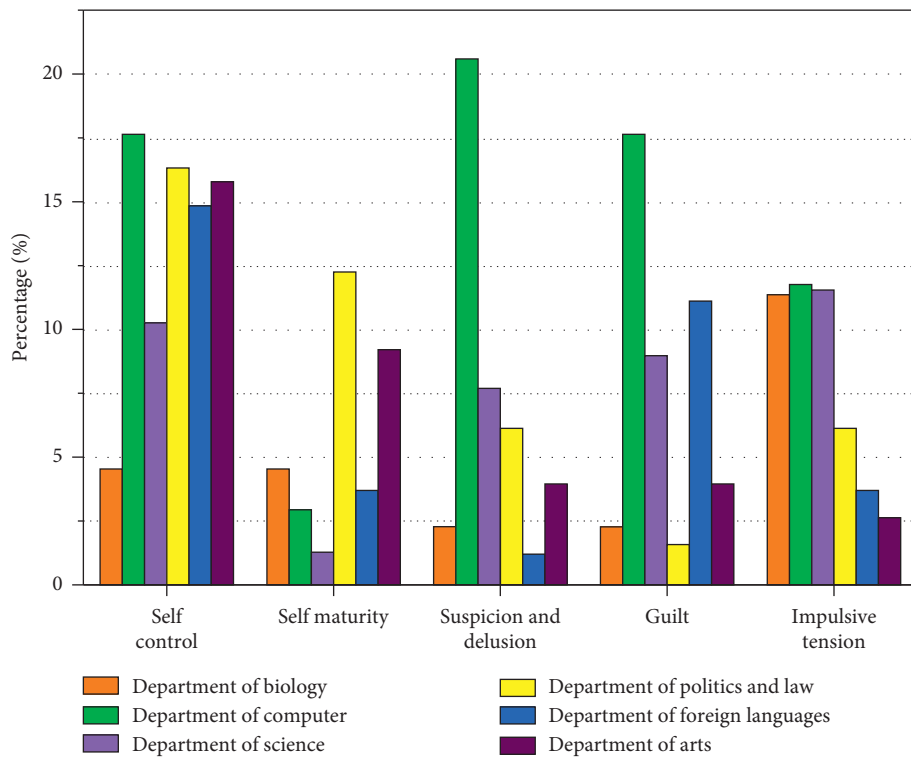


FIGURE 10: Comparison of tests before and after mental health education under different improvement modes.

concerned, the change of the full scale of the number of students with psychological problems is that the percentage of computer department is the highest, reaching 17.64%, and the change of other departments is not obvious.

6. Conclusion

The combination of mental health education and intelligent technology fully reflects the combination of education and new technology. The improvement of college students' mental health education model based on the intelligent model will meet the psychological needs of students to self-check psychological problems with the help of psychological tests to a certain extent and has advantages in the accuracy, flexibility, and openness of the test. At the same time, the platform provides powerful support and auxiliary means for mental health workers, and the test results make their work targeted, greatly improve work efficiency, and reduce work burden. It improves the intelligence of the model and the optimization of the program algorithm. The continuous development of artificial intelligence technology and the continuous optimization of the intelligent model will further promote the efficient development of mental health education in colleges and universities.

Data Availability

All data, models, and code generated or used during the study appear in the submitted manuscript.

Conflicts of Interest

No potential conflicts of interest were reported by the author.

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