



# Research on the Construction of College Mental Health Education Platform Based on “Internet+”

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**Abstract.** College students should not only pay attention to their psychological development and career development, but also pay attention to their spiritual development and personal development, that is, mental health. The purpose of the university mental health education activities is to promote the mental health of all participants in the protective education process. This work was conducted in the process of psychological support in the educational process, including psychological diagnosis, developmental activities, education and prevention work, and counseling. At present, some teachers have some problems in strengthening the mental health education of college students. This paper introduces the construction concept of the “Internet+” university mental health education platform, and clarifies the key technologies, core modules and system *architecture* of the platform construction, in order to provide new ideas for the mental health education in colleges and universities.

**Keywords:** Internet+ · mental health education · job research · university · platform

## 1 Introduction

In recent years, the crisis incidents caused by psychological problems in colleges and universities occur frequently. In serious cases, students fall high and commit suicide, which has caused a significant impact on the social and campus safety and stable environment. The mental health education [1] and management of college students is not optimistic. How to timely and effectively prevent, identify and intervene the individual college students with psychological crisis has become the focus and pain point of mental health education in colleges and universities.

The rapid development of network technology not only brings serious impact to the mental health of college students (such as mobile phone dependence, game addiction is a huge hidden danger of mental health, network social interaction increases loneliness and reduces happiness, the adverse impact of network information, etc.), but also brings new to college students' mental health education.

Opportunities, such as the use of we media to carry out publicity and educational activities, expand educational channels and channels. Therefore, taking the Internet and we-media technology as the carrier, to actively carry out a series of affinity and targeted online education activities is an effective expansion and active extension of offline mental health education. How to give full play to the construction of mental health education network platform [2], through the advantages of large information, high openness, strong influence, and the limitation of time and space, has become a new subject of mental health education in medical colleges in the new era [3].

## **2 Related Concepts of Mental Health**

### **2.1 Definition of Mental Health**

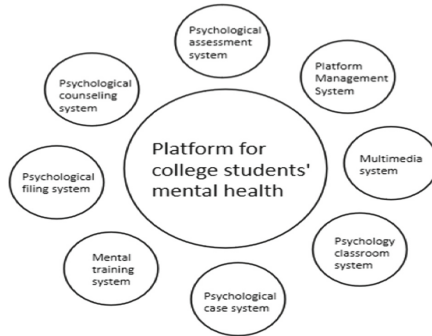
There are more than 300 definitions of "health" that define health: a state of complete physical, mental and social well-being, not just free of disease or physical defects; a set of physical and mental abilities (feasibility) as physical and personality, and a multidimensional dynamic state as a whole, allowing one to perform their biological and social functions in the process of achieving genetic potential in a particular social and economic environment. Therefore, the understanding of health is different, but each definition mentions that an individual's mental (mental) health is an important part of the overall understanding of health. The mental health of students has long been an unpopular topic.

### **2.2 Common Mental Health Problems Among College Students**

Depression, stress, insomnia, eating disorders, lack of sleep, and suicide are all common mental health problems among students. The epidemic has also left a mark on students. The loss of knowledge and time, the inability to resume full-time study and forced isolation have led to the development of various diseases. Eighty percent noted that their mental state had deteriorated during the spread of the coronavirus [4].

### **2.3 Current Situation of Mental Health Teaching Among College Students**

This situation is sad, but a natural question arises: whether universities should take good care of students' mental health. Given that mental and emotional state is everyone's personal responsibility, the answer is quite "no" — University has no obligation to do anything. However, more and more universities understand how valuable students' mental health is. Reason for how valuable mental health is: reputation. Modern university rankings include a "student satisfaction" clause. Therefore, student comfort is extremely important to the university. Academic performance. Another important indicator of academic performance in a university. Students with mental disorders are more likely to drop out and fail their exams, which has a negative impact on universities.



**Fig. 1.** “Internet” college mental health education cloud platform of the core module

### 3 Construction Plan of “Internet + ”University Mental Health Education Cloud Platform

Based on the analysis of the current situation of mental health education and psychological problems of college students, the mental health education cloud platform based on mobile Internet, big data and cloud computing [5], and analyzed from the core module and system framework. The specific construction plan is as follows.

#### 3.1 Analysis of the Core Modules

Order to meet the needs of different levels, the mental health education cloud platform sets up 8 core modules, including psychological evaluation system, psychological counseling system, psychological file system, psychological training system, psychological case system, psychological classroom system, multimedia system and platform management system (Fig. 1). The platform design is flexible and easy to expand, and it can provide personalized and integrated mental health services for college teachers and students by carrying the above core service modules [6].

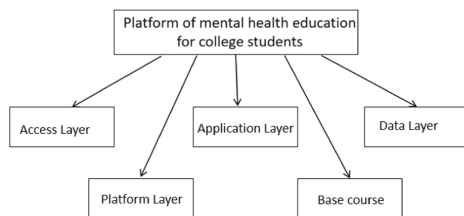
#### 3.2 Platform Architecture

The “Internet + ” university mental health education cloud platform basically serves students. With the help of cloud computing technology, it adopts a service-oriented architecture, which is divided into five layers from the bottom up, namely, the basic layer, platform layer, data layer, application layer and access layer ( Fig. 2).

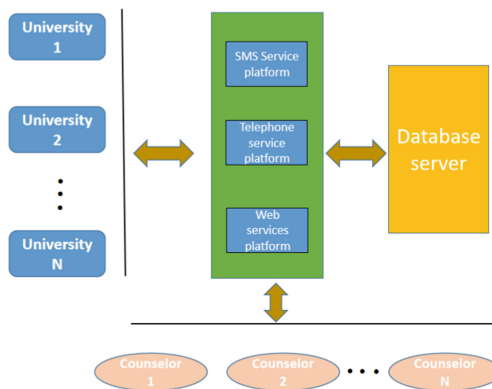
#### 3.3 Regional Shared Platform Construction

In this platform, universities in the region can share services through three service platforms, and counselors can also provide psychological counseling services for students through three service platforms (Fig. 3).

The short message service platform is the service platform which carries on the psychological communication through the wireless network short message. The SMS



**Fig. 2.** The architecture of “Internet” college mental health education cloud platform

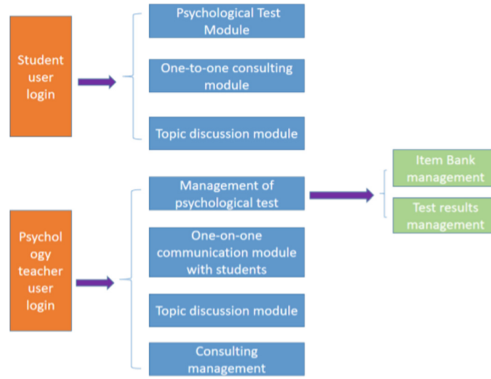


**Fig. 3.** Integrated communication platform

platform supports both Unicom’s SMS and mobile SMS. The application service program provides an application for sending and receiving short messages, and can perform statistical analysis of the sent and received short messages.

Telephone service platform is a service platform that communicates through fixed telephone network or wireless network, and the implementation of telephone service module includes voice data processing system and consulting management system. Voice data processing is actually a small call center, the system mainly to achieve extension transfer (for the case of more than one psychological counseling teacher at the same time), the entire call process recording, display the calling number and time, etc. The counseling management system classifies the types of counseling, analyzes their symptoms, and predicts their future development (if necessary, for students with more severe psychological disorders). In addition, the management system also includes the ability to perform various combined queries on all record communications.

Web service is to solve the problem that students communicate with psychology teachers through the network. It needs to realize the same function as the telephone service module, and it has more flexibility than the telephone service module. The telephone service module can only realize one-to-one consultation, in the same period of time, a psychology teacher can only answer the psychological problems for a classmate, while in the web service mode, the forms are more flexible and diverse. After the psychology teacher logs in, he can enter various management modules: psychological test management, topic discussion management, Consultation Management and one-on-one



**Fig. 4.** Web Service Module

Communication Module with students. The management of psychological test includes item bank management and test result management. Topic discussion management on the one hand requires the discussion of the subject management, such as the addition of topics, delete topics, etc., but also includes the content of the management of the speech, such as for the speech does not meet the requirements of the content filter. The content of consulting management is similar to the telephone service module. One-on-one communication module with students is mainly used to communicate with students, for the psychological teacher end, you can do a view of more than one student's content, and one by one reply. The implementation of the Web Services module is shown in Fig. 4:

## 4 Key Technology Research

### 4.1 Data Types in Cluster Analysis

Data types that often occur in clustering analysis. Suppose the data set to be clustered contains  $N$  objects. In the system, the objects to be clustered are students. Clustering algorithms usually take the following two Data structures as processing objects:

- ① Data matrix, also known as object-variable structure, which uses  $p$  variables (also known as measures or attributes) to represent  $n$  objects, the results of several scales of students' psychological test are taken as the attribute variables of students. This kind of data structure is similar to the form of relational table, or  $n \times P$  ( $N$  objects  $\times$   $P$  variables) order matrix:
- ② Dissimilarity matrix is also called object-object structure, it stores the proximity of all pairs of  $N$  objects, in this system, that is, the similarity of two students, typically represented by an  $n \times n$ -order matrix (Fig. 5):

Where  $d(I, J)$  is the measure difference or dissimilarity between object  $I$  and Object  $J$ . In general,  $D(I, J)$  is a non-negative number. The more similar or "Near" objects  $I$  and  $J$  are, the closer they are to 0; conversely, the more different the two objects, the greater their value. Since  $D(I, J) = d(J, I)$ , and  $D(I, I) = 0$ , we have a tangible matrix (see Fig. 6).

$$\begin{pmatrix} S_{li} & L & S_{lf} & L & S_{lp} \\ L & L & L & L & L \\ S_{li} & L & S_{lf} & L & S_{lp} \\ L & L & L & L & L \\ S_{ni} & L & S_{nf} & L & S_{np} \end{pmatrix}$$

Fig. 5. N-order matrix representation

$$\begin{pmatrix} 0 \\ d(2,1) & 0 \\ d(3,2) & d(3,2) & 0 \\ M & M & M \\ d(n,1) & d(n,1) & L & L & 0 \end{pmatrix}$$

Fig. 6. Tangible matrix

### 4.2 Interval Scalar Variables and Their Standardization

This section first discusses interval scalar variables and their normalization. Then, we introduce the related knowledge of distance measure, which is usually used to calculate the dissimilarity degree of the objects described by this kind of variable. Distance measures typically include the following: Euclidean distance, Manhattan distance.

The interval scaling variable is a continuous variable of rough linear scaling. Typically these include weight, longitude and latitude coordinates, and temperature.

The selected measurement unit will directly affect the result of clustering algorithm analysis. For example, changing weight units from meters to centimeters may result in very different clustering structures. In general, the smaller the units representing variables, the larger the possible result value of variables, and the greater the impact on the result clustering structure. To reduce reliance on the choice of units of measure, data should be standardized. Standardized metrics attempt to give equal weight to all variables. This is useful when there is no prior knowledge of the data. Because the impact of each scale on students' psychological problems is unknown, and there is no prior knowledge, therefore, when clustering students, the results of the scale must be standardized, perhaps, after accumulating a certain amount of data, we can analyze the impact of the results of various scales on students' psychological problems, and we can give different scales different test weights, you can only give the same weight to test results on different scales.

One option for standardization is to convert the original measure to a unit-less measure. Given a measure of a variable F, you can do the following:

① calculate the mean absolute deviation sf:

$$S_f = \frac{1}{n} (|\chi_{1f} - m_f| + |\chi_{2f} - m_f| + L + |\chi_{nf} - m_f|)$$

where  $\chi_{1f}$ ,  $L$ ,  $\chi_{nf}$  are the measures of  $f$ , and  $m_f$  is the mean of  $f$ , that is:

$$m_f = \frac{1}{n} (\chi_{1f} + \chi_{2f} + L + \chi_{nf})$$

② calculate the standard measure or z-score:

$$Z_{if} = \frac{\chi_{if} - m_f}{s_f}$$

The mean absolute deviation  $s_f$  is more robust to outliers than the standard deviation  $\chi_f$ . When calculating the absolute deviation of the mean value, the square of the deviation between the measure value and the mean value is not taken ( $|\chi_{if} - m_f|$ ), so the influence of outliers is reduced to some extent. Although there are Shandong rod deviation measures, such as median absolute deviation, the advantage of using mean absolute deviation is that the z-score of outliers is not too small, so outliers can still be detected.

After standardization, the dissimilarity degree between objects described by interval scaling variables is usually calculated based on the distance between each pair of objects. The most commonly used measure of distance is Euclidean distance, which is defined as follows:

$$d(i, j) = \sqrt{(\chi_{i1} - \chi_{j1})^2 + (\chi_{i2} - \chi_{j2})^2 + L + (\chi_{in} - \chi_{jn})^2}$$

$i = (\chi_{i1}, \chi_{i2}, L, \chi_{in})$ ,  $j = (\chi_{j1}, \chi_{j2}, L, \chi_{jn})$  are two  $N$ -dimensional data objects.

Another measure is the Manhattan distance, which is defined as follows:

$$d(i, j) = |\chi_{i1} - \chi_{j1}| + |\chi_{i2} - \chi_{j2}| + L + |\chi_{in} - \chi_{jn}|$$

If each variable is given a weight based on its importance, the weighted Euclidean distance can be calculated using the following formula:

$$d(i, j) = \sqrt{[(\chi_{i1} - \chi_{j1})w_1 + (\chi_{i2} - \chi_{j2})w_2 + L + (\chi_{in} - \chi_{jn})w_n]^2}$$

The weighting can also be applied to Manhattan distance and Minkowski distance.

This chapter mainly introduced the data mining algorithm K-means algorithm, this algorithm is the core algorithm which this system uses, it also introduces the data structure of its processing, the interval measure variable used in its implementation and the execution process of the algorithm. The contents also include the algorithm in the system of the specific role and specific implementation steps.

## 5 Conclusion

Health psychology is a science of health mental causes, the methods and means of preserving, strengthening, and developing health. The goal of health psychology cannot be finalized because it is more than just protecting health. Health itself can be seen as a condition for a person to successfully achieve their goals in life. Therefore, “the main principle of healthy development is not only to maintain health, but also to achieve your mission with the help of health,” all universities should pay attention to the mental health education for college students.

Relying on the Internet and we-media technology, it is of great significance to establish a mental health education network platform. Network platform is an effective supplement to the first class and second classroom, integrating the resources inside and outside the school, education coverage from students to students, parents and teachers, establish students psychological files and big data, improve targeted education and service, realize student problem screening, intervention, prevention education, personality growth, time, convenient, free, convenient characteristics and advantages, improve school mental health education ability and level, improve medical students; professional competence, the platform needs to be further improved, regional medical in the future.

Treatment resources and professional structure are incorporated into the platform to facilitate the referral work; expand the application scope of the platform, establish a regional integrated service platform of mental health education network, provide data basis for education policy formulation while serving students, and train more medical talents for the country.

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