



## **With the Rapid Development of Society and Big Data Technology from the Perspective of Education Administrators, Students' Mental Health**

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## Abstract

The current advancements in society and big data technologies have led to many stresses on students, including academic, employment, emotional, and economic difficulties. These pressures have significantly disrupted the equilibrium of mental health. Based on a study conducted by a reputable organization, it has been determined that a significant proportion, ranging from around 10% to 25.4%, of college students in several locations have mental health disorders due to a variety of factors, with a higher prevalence seen among first-year students. The prominence of psychological issues among first-year students has been more evident in light of detrimental occurrences such as separation, expulsion, school withdrawal, and instances of suicide stemming from psychological distress. Hence, the timely identification and intervention of psychological issues among first-year students have emerged as a pressing concern that need immediate attention and resolution. Despite students often demonstrating rationality and intellectual maturity, their comprehension of reality and life experiences may be limited, leaving them psychologically vulnerable and susceptible to mental health issues. The prevalence of mental health concerns among college students has become a significant problem due to the accelerating pace of life and the demands for academic achievement. Consequently, an increasing number of colleges and universities have integrated mental health education into their curricula, aiming to enhance students' capacity to analyze and address psychological issues among both incoming and graduating students, employing specialized and expert mental health strategies. Nonetheless, the wide range of mental states among students and the limited resources available to instructors for mental health education provide challenges in successfully addressing the individualized mental health education requirements of students. Consequently, mental health education frequently becomes marginalized and is relegated to a secondary status akin to a folklore course. In light of these conditions, it is essential to enhance the capacity of college educators to assess, identify, and evaluate the mental well-being of students inside educational institutions, using technological resources. This would enable instructors to allocate a greater amount of their efforts and resources towards assisting students in resolving psychological challenges.



***Keywords:*** Educational Sciences, Educational Administration, Students' Mental Health, Data Technology and Students, Educational Sciences and Educational Administration

## Introduction

Artificial intelligence and big data, as burgeoning technologies, has the capability to adequately fulfill the aforementioned requirements. The idea of psychological crisis, first presented by Caplan in 1954, has since garnered significant attention from scholars who have performed extensive study in this area. The primary focus of the study discussed in this article pertains to the variables that influence the psychological crisis experienced by university students. Additionally, the article delves into the development of an early warning index system and an early warning model for psychological crises. Furthermore, it explores the establishment of an early warning mechanism system and the management of early warning interventions. According to Weist et al., the etiology of psychological crises among university students is multifaceted, with individual variables, familial influence, and social environment exerting substantial effect on students' psychological well-being. Perfect et al. used the superiority relationship classification methodology to identify the components contributing to the psychological crises experienced by university students. Reavley et al. and their colleagues conducted a study to examine the impact of stress on an individual's suicidal thoughts and depression. Swisher (year) delineated three distinct components that comprise the early warning indicator system for psychological crises: the external event indicator, the individual knowledge indicator, and the social connection indicator.

The advent of big data technology has introduced a novel instrument for examining the psychological challenges faced by university students, garnering significant interest from scholars in the field. The study primarily focuses on examining the essentiality and suitability of big data technology in psychological research conducted on university students. Additionally, it explores various approaches for its implementation, as well as the development of models and design of application systems. According to Talbott et al., the existing psychological crisis early warning



system in higher education institutions is deemed insufficient and too reliant on clinical scales. Hence, the incorporation of big data thinking is essential for the integration of psychological crisis early warning research in higher education institutions. Chen et al. introduced a novel approach to mental health education for college students within the framework of big data. The study conducted by Guedes et al. The individual in question applied the notion of big data to the realm of mental health education inside higher education institutions. They conducted a comprehensive analysis of mental health data pertaining to university students and then developed a model for a feedback system based on this data. In conclusion, the exploration of early indicators of psychological crises among university students within the context of big data is poised to emerge as a novel and significant research direction in the next years. The use of big data technologies and integration of diverse data systems within the campus setting are important for the development of a psychological crisis early warning system. Previous studies have examined the conceptual model and mechanism of psychological crisis management using big data, but the level of practical implementation remains limited.

This article proposes recommendations for enhancing the utilization of technology among university students, by examining the concepts and characteristics of psychological crises experienced by university students, as well as the challenges and requirements of psychological health education for this population. Psychological health education aims to establish a comprehensive early warning system for psychological crises among university students, utilizing big data. This system is intended to offer theoretical and methodological support, as well as scientific, targeted, and effective countermeasures and reference methods for addressing the psychological challenges faced by university students.

## Healthcare Management

Academic circles have different views on the concept of psychological crisis. Currently, the definition of the psychological crisis connotation basically meets the following conditions:



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① *psychological crisis is the manifestation of the conflict between ideal and reality in people's daily life,*

② *psychological crisis is a variety of negative emotions that individuals cannot find their way to. coping with or resolving sudden events, and*

③ *psychological crisis is a psychological and physiological imbalance caused by the inability of individuals to cope with external interventions.*

To summarize, the psychological crisis of college students refers to the psychological instability caused by college students not reacting in a timely manner after facing emergency situations and then displaying high tension, anxiety, confusion, and other negative emotions.

## Findings

The pursuit of higher education at a university is a significant and transformative phase in an individual's life. University students have a range of challenges and opportunities as they navigate their academic journey, including vocational training, socializing, work, and preparing for postgraduate studies. These individuals must confront many issues and adapt to a communal and autonomous lifestyle while being removed from their parents' guidance and support. Hence, this paper posits that psychological crises experienced by university students have distinct features when compared to other demographic groups. Concealment: The administration of the institution exhibits a notable degree of autonomy. Educators, including teachers, counselors, and classroom instructors, may have challenges in accurately discerning the genuine psychological condition of pupils due to their restricted interactions inside the classroom setting. Nevertheless, a significant proportion of peers who engage in communication lack the necessary abilities to identify psychological issues. When unresolved psychological issues persist, they have a tendency to collect and escalate, ultimately leading to a significant psychological crisis. The Challenge: College students often face challenges in addressing psychological crises, since they typically struggle to achieve psychological healing independently. In the absence of external support,



individuals may be susceptible to succumbing to a cycle of self-negation, potentially leading to harm towards others and engaging in self-destructive behaviors, including suicide. Sudden crises often arise without prior warning and are typically beyond human control. The SARS pandemic that occurred during the spring season elicited significant distress among university students in Beijing at that period. During that period, the established routine of work and personal life was interrupted, resulting in significant psychological crises among university students. These crises were mostly caused by the disturbance of order, the separation from classmates and friends, and the loneliness experienced on campus. University students often experience a sense of helplessness and vulnerability as a result of their past coping mechanisms becoming inadequate in dealing with crises, compounded by an inefficient social support structure.

## Insufficient Attention to Technology Application

In recent years, the use of artificial intelligence and big data in the corporate sector has progressively enhanced the understanding and acknowledgment of the tangible significance of these emerging technologies among educational institutions and educators. However, the implementation of these technologies in real practice remains limited among colleges and universities. The present study aims to examine the role of technology in several connected disciplines and its impact on psychological education for young learners. One aspect to consider is the outdated and ineffective nature of the young learner's mental health guidance mode due to the problem of poor attention. This limitation hinders the successful implementation of scientific research advancements, such as those in big data, within the practice of guiding young learners' mental health. However, it also hinders the research and practical investigation of university professors in the field of artificial intelligence and mental health education for young students. This lack of support limits their ability to effectively promote this kind of teaching.

### 3.2. Challenging Technological Advancement

The use of big data is pervasive across several domains and industries. Empirical evidence indicates that the use of these technologies has potential for the implementation in the cognitive development of university students. The absence of comprehensive and sophisticated guidelines for the practical implementation of content in the context of artificial intelligence and big data poses challenges in using these technologies for the purpose of mental training among young children. The use of big data in the health education of



young kids entails the amalgamation of advanced technologies like big data with specialized disciplines such as psychology. This approach necessitates a comprehensive understanding of not only the educational system or platform but also the proficient knowledge of psychology. Evidently, the presence of such exceptional abilities is infrequent among recently enrolled university students, hence posing significant technological obstacles to the use of big data in the realm of mental health education for college students.

## Data Sharing

The integration of challenging technologies such as 5G network, artificial intelligence, cloud computing, big data, and the "Internet of Things+" has led to the enhancement and revitalization of education management methods, models, and systems. Consequently, the significance and worth of managing data in daily education management have been elevated. Simultaneously, educational institutions and schools progressively enhanced the interchange and collaboration among schools, emphasizing the significance of exchanging and disseminating education administration data. Nevertheless, the successful compatibility and sharing of big data in education administration pose significant challenges owing to the extensive variety and voluminous nature of the data. In the context of software and hardware development, notable disparities exist across various cities, regions, and educational institutions, leading to several challenges in the realm of data transmission and exchange.

## The Impact of University Students' Participation

The relevance and precision of the psychological education that university students get may be improved with the help of artificial intelligence and big data; nevertheless, the prerequisite for accomplishing this impact is to have adequate data knowledge to enable a variety of models and systems to function properly. To put it another way, the engagement of university students in psychological education activities serves as both the premise and the basis for the use of big data in your sector. At the moment, only a small number of students are capable of taking the initiative and participating in activities that are connected to this sector. Some students are unwilling to engage in this kind of mental health training because they are frightened that their private information will be shared without their permission. This low level of participation has a



substantial influence on both AI and big data applications, which in turn leads to a limited role for technology in the teaching of college students' mental health.

## Establishment of an Early Warning System for Psychological Emergencies Based on Big Data Technology

There are a significant number of students enrolled in universities. The huge data collected by students come from a variety of dispersed information sources, and the information value of these data is highly restricted. Deep mining and widespread implementation of big data technologies, on the other hand, have the potential to transform this dispersed information into useful information and, in the long run, generate the knowledge impact that is beneficial to educational institutions and their respective student bodies.

It is a process in which we transfer from the status of student to that of professional gradually. During this time, we will unavoidably face a variety of challenges, and there will be pressure exerted on us in every aspect of our lives. College students have a lower capacity for resilience and digestion than adults, which makes them more likely to experience psychological instability.

### Literature research

This article provides an analysis of the following psychological stimulation data sources after reviewing the relevant study literature and doing in-depth investigation. Attendance and test scores from each individual semester: Take for example the vocational course that a university student takes, which consists of 10 sessions each week. Using a random sample survey of 8000 students in the school, the number of students participating in the sampling survey is 100, and the findings of the survey are summed and averaged.



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However, in some exceptional circumstances, there are certain children who continue to have good scores despite there being fewer teaching hours; it is vital to determine if these students are attending school part-time or whether they have an improper learning weariness as a result of economic challenges. In most cases, the institution has an attendance policy that is rather stringent and mandates that the class work committee must come before each class, count the list of students who were late or missing, and then report it to the institution's study department on the weekends. Following that, the department of learning will transfer responsibility for it to the consultants.

Figure 2 displays the survey results for the data collected by the dormitory access control system. Using the time that guys arrive before going to bed as an example yields two primary pieces of information about the population. The first one is the time of day when you may read your cards the earliest, and the second one is the time you should be back at home. If the check-out time from the dorm is always after 11:00 in the morning, the students who live there are more prone to develop the unhealthy habit of sleeping in, staying up late, and waking up late. Students who have this mindset often report feeling bewildered about aspects of college life that need attention. Returning home late but before the deadline for access control, the demands of higher education, the stress of part-time employment, etc. In addition, the data on the students' use of the school campus card and the amount they pay into the education management system both have the potential to provide information on the students' mental health.

Many students who have had outstanding debts for a significant amount of time are now struggling financially, and the school is applying pressure to compel them to pay their tuition and fees. However, we can't overlook the fact that some students spend their tuition money on other things, which then leads to them having to make payments on their debt. In any event, they are required to be resilient in the face of psychological strain. Students shared the information on some of the most popular social networking sites. The Internet has become the primary medium via which college students convey their feelings to one another. We mostly make use of the social networking applications QQ, WeChat, and Weibo. We often get useful information about the students' mental health via the use of big data technologies, and this only happens with their permission. provides



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an interpretation of student psychology from a psychological point of view. At each distinct level of the institution, there will be its own unique set of challenges. In general, it is not difficult to be away from home during one's first year of college, to have no friends, to have feelings of loneliness, to despise one's department and school, and to need some time to adjust to the way of life on a college campus. Emotional issues, such as those involving interpersonal relationships or romantic relationships, are more likely to surface in the second and third years of college. Students who are in their third or fourth year at the university are getting close to completing their degrees.

The burdensome amount of studying that is required of students who are preparing for postgraduate or civil service examinations is the primary source of anxiety for these individuals. Students who are directly employed often struggle with self-confidence and worry about how their careers will go in the future. In general, various students should have distinct issue preferences. Additionally, schools should make full use of the information included in students' files upon enrollment and ensure that the data is kept up to date in every four years. At the same time, all of the data should be converted to an electronic format and then given to the mental health education center so that the study of the psychological crisis early warning system may go more smoothly.



## Establishment of Psychological Crisis Early Warning System Based on BP Neural Network

**Principle of the BP Neural Network** The fundamental idea behind neural networks is that they should first be used to imitate the way neurons in the human brain carry out their functions. This is deduced from the neural network principle. These perceived signals are transferred to the internal perception unit through a neuron referred to as the entry gate, and they propagate in the forward direction after being detected by a succession of neurons in the network that have been programmed to recognize either external signals or certain actions that are stimulating. At the same time, during the process of propagation, feedback the propagation error to correct the model in order to construct a network through which the skill is communicated together with the propagation signal, and the error may be transmitted back in order to form a BP neural network. Figure 3 provides an illustration of the structure of the network. In this illustration,  $n$  and  $k$  stand for the number of input signals and output results, respectively;  $w_{ij}$  stands for the link weights between the layers, which include the weights between the input layer and the hidden layer, the weights between the hidden layer and the output layer, and the weights between the hidden layer and the output layer; and  $a_j(i)$  stands for the excitation value, where  $i$  stands for the network layer. As a consequence of this, the BP neural network may be seen as a nonlinear function. It can alter the connection weights between several neurons using a process called iterative learning, and it can find complicated rules hidden in the data. Additionally, it has a high level of resilience and fault tolerance.

### BP Neural Network Transaction Process

This chapter introduces the working process of the BP neural network with the learning algorithm and takes the three-layer BP neural network as an example.

We have completed the construction of the psychological crisis early warning system based on the BP neural network model and the campus psychological database on students' academic performance each semester, entry and exit times, campus card consumption (average daily



consumption expenditure) and whether the tuition fee is paid on time, the situation is reflected in the dormitory.

## Class Psychological Committee

The dataset includes measurements of the six aspects of the mental health diagnostic scale, denoted as a, b, c, d, e, and f, representing the number of diagnoses throughout a year. These data, together with the aforementioned outcomes, are used to train a BP neural network model for the purpose of predicting the psychological states of pupils. Simultaneously, in order to assess the dependability of the model presented in this paper, the data used in this study are employed for comparison analysis with the conventional grey prediction model. The evaluation indices for the two models were determined based on their prediction accuracy and model prediction error.

## Argument

The estimate results of the two models are shown in Figures 6.6 and 7.7, correspondingly. As seen in Figure 6, the estimate error of two distinct models exhibits a decreasing trend as the number of iterations grows. Furthermore, it is observed that both models have the potential to attain a minimum test error.

## A Little Value

Nevertheless, it should be noted that the BP neural network prediction model developed in this study exhibits superior performance compared to the gray prediction model used in the comparative analysis, specifically in terms of prediction error and the number of iterations required by the model. One notable observation is that the error of the BP neural network has a tendency to stabilize quickly, typically after around 60 iterations. Moreover, the ultimate error of the model converges to a value near to  $10^{-4}$ , which represents the least achievable error. It might be argued



that the impact of the test error of the model on the outcomes is minimal. On the other hand, the predictive efficacy of the gray forecasting model is limited. The test error of the model is not only much bigger compared to the BP neural network model, but the number of iterations is also more in comparison to the BP model. The model error requires a minimum of 150 iterations to reach a state of stability. Hence, in comparison to the gray prediction model, the students' psychological change prediction model developed in this study, which is based on the BP neural network model, exhibits superior training time and error control capability. Figure 6 illustrates the fluctuation in prediction accuracy for two distinct models as a function of the number of repetitions. It is observed that the predictive accuracy of both models exhibits a progressive improvement as the number of model iterations rises. However, it should be noted that the BP neural network prediction model developed in this study exhibits superior performance compared to the gray prediction model in terms of both prediction accuracy and the number of iterations required for convergence. One notable observation is that the error of the BP neural network may rapidly exceed 0.95 after 100 iterations, with a maximum accuracy of 0.976. On the other hand, the gray scale prediction model has a low level of accuracy in its predictions. The model's prediction accuracy is much worse compared to the BP neural network model, and it also requires a greater number of iterations than the BP model. After undergoing over 150 iterations, the model's prediction accuracy may achieve its highest possible value, which does not surpass 0.8. The paper demonstrates that the BP neural network model developed in this study exhibits superior training speed and prediction accuracy compared to the gray prediction model in the context of the student's psychological change prediction. In conclusion, the present study demonstrates that the student psychological prediction model developed in this article, using a BP neural network, has superior performance in terms of training time and training error compared to other models. Moreover, it demonstrates enhanced accuracy in forecasting students' psychological states. The model developed in this article has a high accuracy rate approaching 1, which signifies its effectiveness and superiority.

The efficacy of higher education institutions in addressing the mental health challenges faced by college students has been significantly compromised. Based on extensive study, this article presents a set of suggestions and actions that are aligned with the prevailing circumstances.



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It is essential for mental health education centers, educational institutions such as schools and universities, parents, as well as the environments of classrooms and dormitories, to collectively establish a comprehensive six-step early warning system designed to identify and address psychological crises. By fostering collaboration across all levels, these stakeholders may effectively support students in overcoming psychological challenges. The responsibility for overall planning is with the school. The primary responsibility of the mental health education center is to provide expert psychological support and help. In the context of education, college often denotes an educational institution where students are guided by instructors and counselors in order to facilitate the exploration and understanding of their psychological development. The familial obligation extends beyond the provision of financial resources for the student, including the task of facilitating psychological development and training. It is recommended that students inside the class, particularly those who are part of the psychological board, provide assistance to students who exhibit poor psychological well-being. Additionally, it is advised that they consistently communicate the psychological status of these students to the counselors and instructors. The image depicts six systems that include both our acquired knowledge and a very efficient approach for addressing the psychological vulnerabilities of young pupils, making it a valuable tool for counseling and treatment. Numerous elements may have influence on this system, including familial, educational, and societal dimensions. Hence, in order to address the physical and mental challenges faced by young kids, it is essential for all three stakeholders to collaborate synergistically to ensure the efficacy of this system.

Discussing psychological concerns may provide challenges for individuals, as they often exhibit adverse emotions or indifference towards psychological assessments and other related issues. Nevertheless, the prevalence of mobile phone use among university students contributes to the reduction of psychological barriers since it eliminates the need for face-to-face contact. The application aims to promote active engagement of college students in the psychological crisis early warning system and encourages their active participation in the six app functions, which include index data inquiry, mental health testing, forum mutual aid, daily mood recording, and psychological status assessment.



## Conclusion

The implementation of a scoring system and the provision of counseling appointments aim to assist students in expressing their psychological concerns without experiencing feelings of disgust or repulsion. The evident susceptibility of university students towards their own psychological issues over an extended period, along with their reticence in discussing them extensively, poses challenges for young students in freely and publicly engaging in their physical and mental well-being education. The use of many platforms, including artificial intelligence and big data, in conjunction with neural network models, enables colleges, institutions, and educators to create a tailored network-based platform for the physical and mental health education of young children. In order to comprehend the material and actively engage in the event, students possess the ability to access the platform at their convenience, regardless of time and location. This feature effectively addresses the apprehensions surrounding the physical and mental well-being of young learners. In the practical implementation of these technologies, institutions of higher education have the potential to establish a comprehensive physical and cognitive educational framework for young learners. Additionally, they can create a tailored mental health education platform that takes into account various factors such as age, gender, socioeconomic status, academic discipline, and other relevant conditions of the students. In the meanwhile, it is crucial to provide an enhanced educational setting and provide conducive circumstances for students to engage in the use of technology. In the meantime, it is imperative to prioritize the prompt and unbiased evaluation of the outcomes of mental health education. This will enable young students to genuinely perceive the benefits and significance of artificial intelligence and big data in the realm of mental health education. Consequently, this approach will gradually eradicate any instances of exclusion and resistance that may exist within the domain of mental health education.

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