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Research on the Application of Information Grain-based Affective Computing Model in College Students' Psychoeducation

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Abstract: Aiming at the problems of gradual curricularization of college students' psychological education and poor targeting of teaching content, this paper establishes an emotional calculation model to understand the key factors of college students' emotional needs, emotional type and intensity, and emotional classification. The definition and optimization method of information granularity are clarified to calculate the emotional factors. Meanwhile, the selection of emotional need variables and related assumptions are introduced, and the validity and applicability of the emotional factors are verified using multiple linear regression. The results showed that in terms of mental health teaching effectiveness, the emotion calculation model based on information granules improved by 19.5%, and the control group that did not use the emotion calculation model had a relatively weak teaching effectiveness in psychoeducation with a T-value less than 1. Three of the experimental groups' psychological test scores reached 10 points, and by deeply exploring the emotional factors they are expected to provide college students with more personalized and comprehensive psychoeducational support to promote their mental health and overall development.

Keywords: information granularity; affective computing model; multiple linear regression; psychoeducation; affective factors

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1. Introduction

Affective computing has become a subject with cutting-edge scientific characteristics in artificial intelligence, and its development direction is of great significance for realizing harmonious human-computer interaction and intelligent information processing [1]. More and more studies have proven that contemporary college students have psychological problems of varying degrees, and their mental health levels are worrying [2]. Due to the omission of psychological education, many college students seriously lack knowledge related to mental health. They are unable to use mental health skills to adjust after encountering difficulties and setbacks. When the pressures of students and life come together, various psychological problems occur [3]. Although traditional psychological education plays a

corresponding role in reducing the occurrence of mental diseases, improving students' psychological quality, and improving their mental health level, the overall level of mental health of college students has not generally improved [4]. The main reason can be attributed to the fact that psychological education in colleges and universities is mainly founded on negative psychology and ignores the development of positive factors in college students' psychological experience and psychological potential [5]. Carrying out positive psychological education and cultivating all-round talents are also necessary measures to promote the all-round development of college students [6].

This paper constructs a model of emotion calculation in college students' psychoeducation, followed by the use of information granulation for granulation calculation, which aggregates the basic grains in the domain of the theory into several either independent or intersecting sets for granulation. The conceptual axioms are a series of conditional attributes to obtain the emotional knowledge base model based on granular computing, which abstracts the relational database into an information system and classifies it according to rules. Finally, the significance of the model is tested by multiple linear regression, using the least squares method to find the partial regression coefficients, after which the importance of the affective computing model is tested as necessary. The algorithm can effectively model the nonlinear characteristics of emotion on the relevant variables, and the affective computational model can be constructed based on the decision-making process of emotional information granularity.

2. Literature review

Literature [7] applies case teaching method in mental health education. Based on the concept and application process of the case teaching method, it has been verified that the case teaching method can help students develop good thinking habits and relieve students' psychological pressure. Literature [8] proposed that mental health education has been a research hotspot in education, which is of great significance to students' physical and mental development. Through the study of common psychological problems of young children and the current situation of teachers' mental health education, it is found that early childhood mental health education exists in the lack of a perfect early childhood mental health teaching system, early childhood mental health education cognitive bias and other problems. Corresponding optimization paths are proposed to improve the professional level of early childhood teachers and promote the healthy development of young children. In the context of the rapid growth of the Internet, literature [9] shows that the application of network technology has a positive impact on student's mental health education and proposes specific measures to improve students' mental health, thereby improving students' mental health index. Literature [10] takes enhancing students' psychological quality as the research goal and proposes an educational model based on data mining technology. It indicates that schools should set up mental health education consultation institutions to encourage teachers and students to self-regulate their emotions to enhance their psychological quality. Literature [11] has proposed that strengthening the mental health education of college students in the network environment has become one of the critical issues in the current education reform. The research status of the topic was investigated, and relevant theories and technologies were analyzed. A program to improve the informatization level of psychological teaching in colleges and universities based on the network was designed and experimented with. The program's feasibility, advancement and effectiveness were illustrated through specific data. Literature [12] proposed a mental health education intervention model based on stress coping in the study, and found that students in different disciplines have different levels of stress. Teachers should pay attention to this phenomenon and guide students to solve psychological problems as soon as possible. When encountering stress, a confident and optimistic attitude will greatly relieve stress. Literature [13] proposes the construction of a computer-based platform for college students' mental health education. A test was conducted with students of a university to evaluate the

system's registration and use functions. The experimental results show that the system is effective and feasible. Literature [14] assessed and intervened in the mental health problems of students in vocational colleges and universities so as to develop appropriate intervention mechanisms. A combination of questionnaires and in-depth interviews were used to investigate and collect information on the mental health status of students in higher education institutions. Corresponding intervention mechanisms were developed based on the results obtained. The results found that 34.82% of the students' mental health status was relatively healthy, while 22.22% of the students had some problems. This study develops intervention programs to address students' mental health issues from three different perspectives.

3. Modeling emotional calculation

Affective computing models are considered to be a key component in achieving more effective human-computer interaction by engaging with the user's emotions, and are based on and fundamental to the understanding and representation of natural emotional substance. Affective computing models can be broadly categorized into two types, design-based models and task-based models. Design-based models seek to simulate the natural occurrence of emotions, focusing on the exploration of the internal underlying mechanisms that cause emotional behaviors to arise and change [15-16]. Such models tend to treat emotion as a component of human cognitive mechanisms, focusing on integration with cognitive appraisal, motivation, mindfulness, and other processes. The model consists of two components, the response layer, which generates low-level, immediate responses to stimuli and the planning layer, which mainly manages emotions and dispositions. The basic idea of this model is to reflect the interaction of emotion and cognition in the thinking process. Task-based models aim to achieve specific, concrete tasks, focusing on the simulation of emotional behaviors, performances, or decisions produced by natural emotions without focusing too much on the mechanisms of natural emotion occurrence, and such models are also very useful for solving specific problems in specific domains. Figure 1 shows the emotional computing model in college students' psychoeducation, with the bottom-up model being the perceptual information-emotion level, the conceptual knowledge-affection level, and the schema intelligence-will level, and the modules within the layers belong to the tight interaction self-organization completion.

Currently, the research on affective computing includes the directions of emotion recognition, emotion generation and emotion expression. The ultimate goal of affective computing is to establish an intelligent decision-making system with emotions so that computers can think more like people and realize harmonious human-computer interaction. Value needs represent the importance and meaning an individual attaches to certain information or activities, and their value needs are captured by analyzing college students’ behaviors, words, and interactions on online social media. By monitoring physiological indicators, behavioral patterns, and verbal expressions, the affective computing model can identify the instinctive needs of college students [17]. For example, the needs for safety, belonging, and self-actualization.

College students are in the critical period of growth, the outlook on life, worldview and values are prone to fluctuations, for this reason psychological problems can never be ignored [18-19]. At the same time, college students are eager to show themselves and want to be recognized by others. The use of emotional calculation model not only conforms to the characteristics of physical and mental development of college students, but also pays more attention to encouraging college students to participate in the whole process and diversified experience [20-21]. Psychological education for college students can effectively solve psychological problems, deal with psychological crisis events, and reduce injuries and other problems affecting normal study and life caused by negative psychological emotions of college students [22]. Not only that, through the application of the emotional computing model in college students' psychological education, it can effectively improve the psychological quality of college students,

emphasize and highlight the positive attributes of college students, solve psychological problems through the enhancement of the advantages of human nature, and shape the optimistic personality of college students at a higher level.

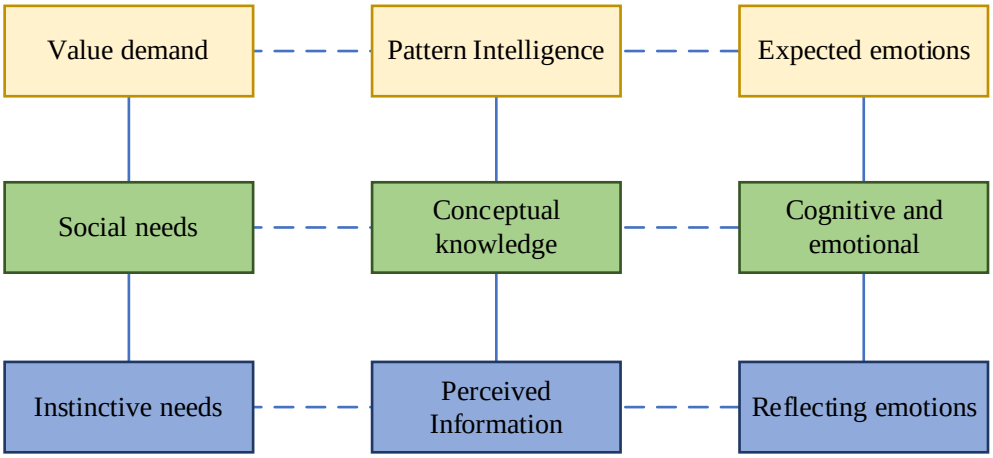

Figure 1 Emotional computing model

4. A Research Framework for College Students' Psychoeducation Based on Information Granularity

4.1 Infoparticles

4.1.1 Definition of Information Granules

Information grain is a view of the objective world worldview and methodology, it can be the original coarse information grain of the large object is divided into a number of fine information grain of small objects for research, can also be the original fine information grain of a number of small objects combined into a number of coarse information grain of large objects for research. That is, the domain is divided into the space with different granularity to take the information grain as the most basic unit of problem solving. Granular computing is a new information and knowledge processing method in the field of artificial intelligence, which has been applied to different fields by more and more researchers in recent years.

Given a domain U, the process of aggregating the elementary grains in the domain into several independent or intersecting sets based on relations or semantics $R_{ij}(i, j = 1, 2\ldots)$ is called granulation. The sets are called grains, and grains can continue to be granulated into the next level of grains. Grain, grain coarseness and fineness, relations between grains, and grain operations constitute the basic elements of granulation. The coarseness of a granule indicates the relationship between granules at the level of abstraction and refinement, which can be represented by the binary relations independence, closure, and coverage, etc. Granule operations can construct new granules. A set of objects can be regarded as a granule through closure, neighborhood space, etc. A granule is defined as:

$$G = \{X | X \quad isr \ R\} \tag{1}$$

where X is a variable in the domain U, R is a constraint relation, and isr is a variable relation operator. where r is a discrete variable, and the value of r defines the way in which R the constraint X is constrained, which can be equivalent, probabilistic, fuzzy, etc. For example, if we set the

constraint to be an equivalence constraint, $r = e$, X *ise a* means $X = a$.

4.1.2 Information granularity optimization

A problem is described by a triad (X, F, T), where X denotes the problem's thesis domain, and $F: X \to Y$, denotes the attributes of the thesis that can be single-valued or multi-valued[25-26]. T is the structure of the thesis domain, referring to the interrelationships of the elements in the domain.

Let X represent a simplification of the finest grain in the domain to produce a domain of a larger level of grains $[X]$. Turn the original problem (X, F, T) into a problem at a new level $([X], [F], [T])$. This simplification process is identical to the mathematical notion of quotient set, so that the worlds of different grains are united with the mathematical notion of quotient set, or the quotient set is used as the mathematical model for the worlds of different grains. Figure 2 shows the information granule optimization process. Information granules group complex data or information into smaller and more manageable units to improve the performance of the emotional computing model [23-24].

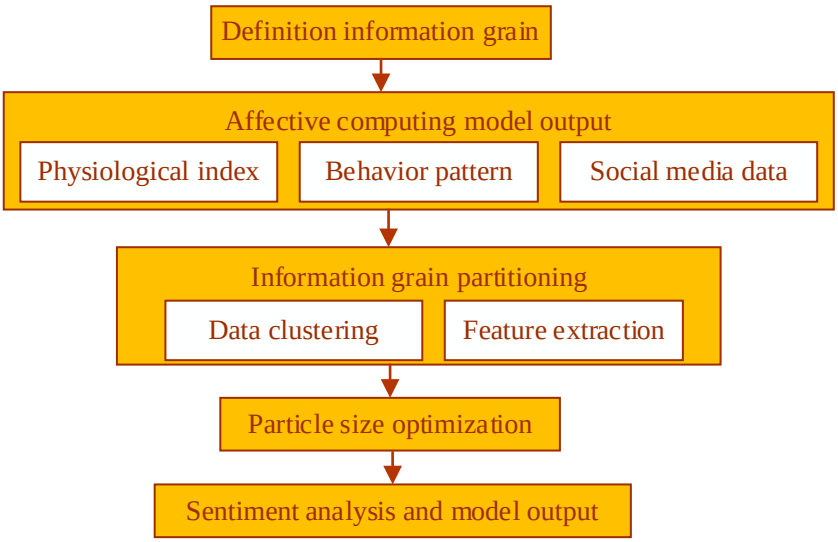

Figure 2 Information grain optimization process

4.2 Application of Information Granules in Affective Computing

4.2.1 Sentiment set solving

Basic emotion theory is used in calculations to classify students' emotion types into type N. Because the emotion intensity has fuzzy characteristics, discrete forms are used to express each emotion intensity, which is divided into M levels. In order to facilitate calculation, the five-level index system in fuzzy mathematics is selected to express a specific emotional intensity value V_i, as:

$$V_i = \begin{cases} 0, \\ 0.3, \\ 0.5, \\ 0.8, \\ 1, \end{cases} \quad (2)$$

Then the emotional intensity is discretized into E levels, and a specific emotional intensity value V is obtained:

$$\begin{pmatrix} E \\ V \end{pmatrix} = \begin{pmatrix} e_1 & e_2 & \cdots & e_n \\ v_1 & v_2 & \cdots & v_n \end{pmatrix} \quad (3)$$

Through equation (3), the emotion vector $E =< v_1, v_2, \ldots, v_n >$ is obtained.

4.2.2 Type and intensity of emotion

After solving the emotion set, establish a triplet $K =< T, S, B >$, T is the axiom of the emotion field, S is the causal relationship between students and emotion types, B is the dynamically changing emotion set of students, and $\forall x(C(x) \to D(x))$ is obtained.

C and D are emotions, and x is the student object. Omit $\forall x$ and simplify it to get $C(x) \to D(x)$, and the emotional causal constraint is $\forall x_1 \ldots \forall x_n(\varphi \to \psi)$.

Both φ and ψ are formulas with individual variables that contain individual variables in $x_1, \ldots, x_n$. The intuition is that for any individual $x_1, \ldots, x_n, \varphi(x_1, \ldots, x_n)$ implies $\psi(x_1, \ldots, x_n)$. The full measure $\forall x_1 \ldots \forall x_n$ is usually omitted. The full measure 6 is also usually omitted and abbreviated to $\varphi(x_1, \ldots, x_n) \to \psi(x_1, \ldots, x_n)$.

In emotion intensity recognition, the existing causal form is $A \to B$, and the emotion vector $E =< v_1, v_2, \ldots, v_n >$ is an assertion form that represents the student's current emotion and intensity.

4.2.3 Classification of emotions

On the basis of the above model of emotional knowledge base, if C in conceptual axiom $C \to D$ is defined as a series of conditional attributes, and D is defined as a decision attribute, the model of emotional knowledge base based on granular computing can be obtained [27].

The theory of granular computing mainly takes relational databases as the object of study, and usually abstracts a relational database as an information system. An information system S is a quaternion:

$$S = (U, R = C \cup D, V, f) \quad (4)$$

Where, $U=\{x_1,\ldots,x_n\}$, is a finite set of objects i.e., the argument domain, $C=\{a_1,\ldots,a_k\}$ is the set of conditional attributes, D is denoted as the set of decision attributes $V=\{v_1,\ldots,v_k\}$ is the set of value domains of the attributes, v_k is the value domain of the attribute a_k, f is the information function, and $f:U\times R-R$. Generally, only the case where there is only one decision attribute is considered, and for the multi-decision attribute problem it can be reduced to a single-decision attribute problem to deal with [28].

The rough set model of sentiment knowledge base is defined as follows:

An affective computing system is a quaternion $S=\{U,R=C\cup D,V,f\}$, where U is the set of objects, R is the set of attributes, C is the set of conditional attributes, D denotes the decision attributes, i.e., the categorization of the affects, V is the set of attribute values, and f is the information function denoting the attribute values of each object X on U.

Assuming attribute set $P\subseteq R$, object $X,Y\in U$, for each $a\in P$, if there is a $f(X,a)=f(Y,a)$, then X and Y are said to be indistinguishable, i.e., $\mathrm{IND}(P)=\{(X,Y)\in U$. $IND(P)$ is an equivalence relation such that attribute set P can be considered to be the name of a piece of knowledge expressed in terms of an equivalence relation. Thus, a sentiment computing system can be regarded as a knowledge base system that, when there is an object to be analyzed, determines the sentiment rule corresponding to that object according to $IND(P)$ and classifies it according to the rule.

5. Model Training and Fitting

5.1 Emotional Need Variables

The research dataset of this paper contains numerous influencing factors and affective qualities, and the role of different influencing factors on different affective qualities is different. In this paper, the role of influence of different factors is examined with the help of multiple linear regression analysis.

It is assumed that there is a total of n observation, p independent variables and one dependent variable as shown below:

$$Y=\begin{bmatrix}y_1\\y_2\\\vdots\\y_n\end{bmatrix}\quad X=\begin{bmatrix}x_{11}&x_{12}&\cdots&x_{1p}\\x_{21}&x_{22}&\cdots&x_{2p}\\\vdots&\vdots&\ddots&\vdots\\x_{n1}&x_{n2}&\cdots&x_{np}\end{bmatrix} \tag{5}$$

The independent variable is the variable that is used as an input or predictor in the study, denoted as X. The dependent variable Y is the variable that is used as an output or predicted in the study. The linear relationship between Y and $X_1,X_2,\cdots\cdots,X_p$ is:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p + \varepsilon \tag{6}$$

Among them, $\beta = \begin{bmatrix} \beta_1 \\ \beta_2 \\ \vdots \\ \beta_n \end{bmatrix}, \varepsilon = \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \vdots \\ \varepsilon_n \end{bmatrix}$ and $\beta_0, \beta_1, \beta_2, \cdots, \beta_p$ are the intercept and partial regression coefficient of the multiple linear regression model respectively, β represents the impact of each independent variable on the dependent variable.

5.2 Assumption of psycho-pedagogical practicality

In the context of psych educational utility, it is hypothesized that a certain model, for example, a computational model of emotion based on information granularity, is used to explain changes in the psychoeducational utility of college students. In this context, the significance test of the model is linked to the hypothesis of psychoeducational utility.

The least squares method is usually used to obtain the partial regression coefficients. The assumptions are:

$$H_0 : \beta_0 = \beta_1 = \cdots = \beta_p = 0 \tag{7}$$

Total sum of squared deviations $TSS = \sum_{i=1}^{n} \left(y_i - \overline{y} \right)^2$, regression sum of squared deviations $RSS = \sum_{i=1}^{n} (\hat{y} - \overline{y})^2$, and error sum of squared deviations $ESS = \sum_{i=1}^{n} \left(y_i - \hat{y} \right)^2$, which are constrained from each other, $TSS = RSS + ESS$. As follows:

$$F = \frac{RSS / p}{ESS / (n - p - 1)} \sim F(p, n - p - 1) \tag{8}$$

where p is the degree of freedom of RSS and $(n - p - 1)$ is the degree of freedom of ESS .

The test of significance helps to determine whether the model can explain the variation in psychoeducational utility and provide statistical support.

5.3 Validation of emotional factors

It is also necessary to conduct a significance test on the regression coefficient calculated by the emotional granule, as follows:

$$H_0 : \beta_j = 0 \ \ j = 0, 1, 2, \cdots, p \tag{9}$$

The choice of a significance level of 0.05 is an empirical decision, usually used to balance significance and credibility. Regarding the relevance of psycho-education practicality, this algorithm effectively simulates the nonlinear characteristics of emotion on relevant variables, and uses the emotional knowledge base to describe the decision-making process of emotional information particles, thus

providing practical statistical results.

Emotional factor s can be expressed as:

$$s = \frac{e - n}{a} \tag{10}$$

s represents the emotional tendency in the text, calculated based on the number of positive emotion words e minus the number of negative emotion words n, and then divided by the number of total emotion words for normalization. The result of this formula can be a value between 1 and 1, where positive values represent positive sentiment, negative values represent negative sentiment, and 0 represents neutral sentiment.

6. Analysis of the application of affective computing model in university psychoeducation

6. 1 T-value test

In this paper, 100 university students were divided into experimental and control groups. They were analyzed in practice using the emotion calculation model based on information grain and traditional psychoeducational methods, respectively. The selected survey objects include students of science and engineering, economic management and comprehensive classes, which are representative and can reflect the phenomenon of applying the emotion calculation model based on information grain in college students' psychoeducation to a certain extent. In terms of gender, the proportion of men and women is relatively balanced; in terms of grade distribution, there are slightly more first- and second-year students; in terms of discipline distribution, the distribution of disciplines is relatively balanced; in terms of political profile, the most members of the League, and in terms of whether they are student cadres, the distribution is relatively balanced. Overall, the sample distribution is reasonable, and the sampling has a certain degree of universality and representativeness. The data were statistically processed and analyzed using SPSS25.0, and the pre-test self-assessment scale test was administered to the two groups of students before the experiment began. Table 1 compares the pre-test results of the two groups of students in the concept of mental health on the index of the highest score value, the experimental group of 2.2002 and the control group of 2.1400. experimental group and the control group in the six factors, and the total score of no significant difference indicates no difference between the two groups regarding the psychological condition before the experiment.

Table 1 Comparison of Pre test Results

	Experimental group		Control group		T
	M	SD	M	SD	
Emotion control	1.60078	0.5122	1.5944	0.5108	0.070
Concept of mental health	2.2002	0.6055	2.1400	0.6421	0.288
Self-awareness	2.0621	0.5287	1.9298	0.5109	0.798
Interpersonal relationship	2.1089	0.6055	1.9799	0.6108	0.723
Personality psychology	1.8254	0.5834	1.9089	0.5821	0.406
Learning psychology	1.8921	0.6224	2.0211	0.6208	0.569

6.2 Positive impacts of the model

6.2.1 Transmission effects

Colleges and universities are gradually paying more and more attention to psychological education, and some colleges and universities have taken positive measures, such as setting up mental health education courses and providing corresponding assessments and credits. This trend has promoted the enrichment of educational activities to a certain extent. In particular, some colleges and universities have updated their educational concepts and incorporated the content of positive psychology, which has played a certain role in improving the psychological quality of college students. The content of psychological education should be richer, including but not limited to interpersonal relationships, emotion management, will cultivation, etc. surface

In actual teaching, most educators first lay out the psychological problems that students may have and then interpret psychological phenomena, analyze psychological issues, and solve psychological problems so that students can connect with their reality to solve the problems they encounter in the future. Psychological publicity activities also tend to guide college students to pay attention to their psychological problems and do not connect with the actual needs of college students. This relatively outdated educational content has not improved students' psychological quality, making mental health education fall into a passive situation. The positive psychological qualities of college students, such as self-confidence and optimism, are crucial to personal growth. Therefore, schools must carry out more active and innovative mental health education activities. In the subjective part, some students suggested that colleges and universities innovate the content of mental health education to meet the actual needs of college students better. This kind of innovation includes updating content. It needs to consider the innovation of teaching methods and means to more effectively guide students to improve their psychological quality and make mental health education more practical.

Table 2 Evaluation of Psychological Education Content

	Experimental group	Control group
Full compliance	13%	18%
More in line	34%	35%
Indeterminacy	5%	6%
Non Conformance	48%	41%

With the in-depth promotion of psychological education in colleges and universities, all aspects of work have been extensively developed and improved, and the atmosphere of psychological education has become more robust. Psychological education work permeates all aspects of student training, education, and teaching; students' direct contact and perception of mental health education opportunities increase when participating in the experience. Affective computing can also improve students' recognition of the work. The two groups of students in the experimental process were based on the influence of the teaching effect to enhance the impact of the test. Table 3 shows the impact of college students' psychological education on the improvement of teaching effect, compared with the traditional psychological education method, the experimental group using the emotional calculation model based on the information grain in the mental health of the index of teaching effect increased by 19.5%. The effects of interpersonal relationship, self-knowledge, emotion management, mental health, and environmental adaptation are all significant, with 17.5%, 15.5%, 10.8%, 19.5%, and 14.5% improvement, respectively. The university stage is a key period for the construction and improvement of college students' psychological quality, and the

age difference of different college students will affect their psychological needs, and based on the emotional calculation model, the establishment of a targeted, typed and hierarchical curriculum system can truly meet the needs of students' multi-level psychological and physiological development. For this reason, the curriculum design of college students' psychoeducation courses should generally be in line with the physiological and psychological characteristics of the university, i.e., the curriculum design should be targeted, life-oriented, flexible and operative in order to better realize the objectives of the courses.

Table 3 The impact of psychological education on improving teaching effectiveness

Index	Experimental group	Control group	Improvement rate%	Significance
Interpersonal relationship	18.5	15.4	17.5	Remarkable
Self-awareness	19.5	15.2	15.5	Remarkable
Emotional management	15.5	13.5	10.8	Remarkable
Learning psychology	12.8	9.8	6.9	Not significant
Mental Health	14.8	13.9	19.5	Remarkable
Career	8.8	6.3	5.5	Not significant
Environmental adaptation	10.5	8.5	14.5	Remarkable

6.2.2 Enhancing the mental health of university students

In order better play the role of the affective computing model in the psychological education of college students, this article uses the symptom self-rating scale, which contains multiple dimensions, such as anxiety, depression, self-esteem, etc. In the mid-term of the experiment, mid-term tests were conducted on students in the experimental group and the control group to test the teaching effect. Table 4 shows the comparison results between two groups. Compared with the pre-test results, the mid-test results have improved scores. The experimental group’s mental health concept index score reached 2.2405, and the index T value was 0.853. Six indicators significantly differed between the experimental class and the control class. The experimental class's factor scores were significantly lower than those of the control class. That is, the experimental class's mental health status was significantly improved compared with the control class's.

Table 4 Test results in the experimental and control groups

	EG		CG		T
	M	SD	M	SD	0.085
Emotion control	1.7849	0.6732	1.6578	0.5834	0.413
Concept of mental health	2.2405	0.7153	2.2045	0.5943	0.853
Self-awareness	2.1550	0.5585	1.9967	0.4971	0.875
Interpersonal relationship	2.1899	0.6784	1.9823	0.5867	0.574
Personality	1.9256	0.6233	1.7856	0.5545	0.643

psychology					
Learning psychology	1.9875	0.7105	1.7945	0.6043	0.664

6.3 Analysis of psychological test results

6.3.1 Evaluation of mood indicators

At the later stage of the experiment, for the indicators of the psychological state produced by the two groups throughout the experiment, the three indicators of significance, interpersonal relationships, self-knowledge, and emotion management, were selected and tested in 10 sessions.

This article selected emotional state, learning motivation, and self-efficacy as emotional indicators, and adopted a standard testing process to ensure the consistency of the testing environment and the standardization of students' acceptance of the test. The psychological test scores of the experimental group are shown in Table 5. The overall test scores of the experimental group are higher, with scores reaching 10 points in all three indicators, and the lowest score is 7 points. The overall scores are higher than those of the students in the control group. In order to improve the emotional state, it is recommended to implement regular emotional courses and use affective computing models to monitor and evaluate students' emotions in real time. This can be achieved through online platforms, mobile applications, etc. In order to promote learning motivation, it is recommended to implement personalized learning plans, use affective computing models to identify students' learning preferences and motivation factors, and provide corresponding support according to individual needs. Through regular monitoring of affective states and the implementation of affective courses, it is expected that students will experience more positive affective states, helping to improve academic performance and mental health. The implementation of personalized learning plans is expected to stimulate students' learning interest and motivation and improve their learning ability.

Table 5 Psychometric test scores of the experimental group

Course/Session	Interpersonal Relationships	Self-awareness	Emotion Management
1	8	7	7
2	7.5	7	8
3	7	8	7
4	7	6.5	9
5	9	7.5	10
6	8.5	8	8
7	8	10	10
8	9.5	9	9
9	10	8	10
10	9	8.5	10

The psychological test scores of the control group are shown in Table 6, and the overall scores of the control group are lower than those of the experimental group, with the highest score of 6.5 and the lowest score of 4. According to the survey research on the status of college students' psychological education, the overall psychological health of college students is good. The problem lies in the fact that college students are not able to positively face and solve psychological problems, they need too little help from the outside world, and they pay too much attention to their own negative aspects. Once psychological problems occur, they have an impact on themselves, and negative factors grow. How to make college students face

psychological problems positively, how to make college students cultivate their positive qualities and strength in daily life, and how to prevent the occurrence of psychological problems are the next problems to be solved in psychological education. Psychological education for college students includes many areas, such as self-knowledge, harmonious relationship, study life, stress management, emotion control, relationship psychology and employment guidance. Psychological education integrating the emotional computing model should first clarify the theme objectives, select a certain content or a cross-cutting theme in multiple fields, and at the same time, combine the subjective needs of the members, as well as the actual characteristics of the learning situation, and avoid generalization and abstraction. High-quality thematic objectives will not only play a real-time traction role, but also ensure that the activities will not be biased, promote the cohesion between members of the generation, so that college students can be brave and open to express themselves in the activities, the effect of counseling twice the result with half the effort. In conclusion, the application of the emotional computing model in the psychological education of college students is not only the inevitable trend of the times, but also a breakthrough in the psychological education reform to achieve the desired results. As an effective way and method of work, in the process of teaching practice, it should be combined with the characteristics of school and learning situation, centered on certain themes, and increase the amount of discourse of college students during the study period. By creating a safe, relaxed and pleasant atmosphere, college students are led into various situations so that they can find a sense of trust, responsibility and belonging in the group. In addition, the emotional calculation model is further promoted so that the cognitive power and willpower of the participants can be developed, helping college students learn to actively interact and regulate their emotions through observation, experience and exploration. Rapidly adapting to interpersonal relationships and promoting the development of their healthy behaviors in sincere and harmonious discussions and activities.

Table 6 Psychometric test scores of the experimental group

Course/Session	Interpersonal Relationships	Self-awareness	Emotion Management
1	5	4	4
2	5.5	5	4.5
3	6	4.5	5
4	5	4	4
5	4.5	6	5.5
6	6.5	5	6
7	5	6	6.5
8	4.5	5	6
9	6	5	5
10	4	4.5	5

6.3.2 Promoting psychological self-regulation

After the psychometric tests were conducted, paired sample t-tests were performed on the pre and post-test results of the control group. Table 7 shows the analysis of the pre and post-test results of the control group, the test results of the two indexes of self-perception and learning psychology were higher than the pre-test scores, which were 1.9479 and 2.1854, respectively. without teaching the control group based on the affective computing model in the pre and post-tests after experiencing 3 months, the scores of each factor of the post-test compared to each factor of the pre-test had declined but there was no difference in the paired samples t-test. Specifically, affective control showed a decrease after the experiment, with a pretest mean of 1.5944 and a posttest mean of 1.4859. Mental health concepts posttest

mean decreased to 2.1000 with a t-value of only 0.273, indicating that this change was less significant. Interpersonal Relationships had a pre-test mean of 1.9089 and the post-test mean decreased to 1.6995 with a T-value of 1.056, which is a significant change but a small T-value indicating that the change is not significant. In personality psychology, the post-test mean increased to 2.1854, indicating that there is still a need to further understand the reasons for this situation among college students. In Learning Psychology, the T-value increased significantly to 1.415, indicating that students' understanding and application of Learning Psychology has improved. Emotional control and other indicators showed different degrees of changes after the experiment, reflecting that there is still a need for further research on the reasons that may need to focus on these changes, and to understand the effectiveness of the application in the psychological education of college students through the model of emotional calculation based on information granularity.

Table 7 Analysis of pre - and post test results in the control group

	Pre-test		Post-test		T
	M	SD	M	SD	
Emotion control	1.5944	0.5108	1.4859	0.5366	0.683
Concept of mental health	2.1400	0.6421	2.1000	0.5988	0.273
Self-awareness	1.9298	0.5109	1.9479	0.4696	0.129
Iterpersonal relationship	1.9799	0.6108	1.8588	0.6744	0.621
Personality psychology	1.9089	0.5821	1.6995	0.5483	1.056
Learning psychology	2.0211	0.6208	2.1854	0.7532	1.415

Table 8 shows the pre- and post-test results of the experimental group. The experimental group's post-test mental health concept value was 2.4210, which was significantly higher than the control group's 2.1000. The mean values of the pre-test and post-test of emotional control are 1.60078 1.8942, which are significantly improved after the experiments, which shows that the psycho-educational program has a positive impact on the students' ability to manage their emotions. The post-test mean of mental health conceptualization increased to 2.4210, indicating that students had a more comprehensive understanding of mental health. The standard deviation of self-concept pre-test and post-test was 0.5287 and 0.5982, and self-concept improved significantly after the experiment, reflecting students' deepening and expanding of their own knowledge. The interpersonal relationship pre-test was 2.1089 and post-test was 2.3226, showing the positive effect of the psycho-educational program on improving students' social skills. The Personality Psychology T-value of 1.357 was due to students' deeper understanding of their personalities and behavioral patterns. The mean values of pre-test and post-test of student psychology were 1.8921 and 2.3267, reflecting students' deeper understanding of the learning process and psychological influences. The experimental group made significant progress in all indicators after the psychoeducational program, especially in promoting psychological self-regulation, which supports the potential application of the information-granule-based affective computing model in the psychoeducation of college students.

Table 8 Analysis of pre - and post test results in the experimental group

	Pre-test		Post-test		T
	M	SD	M	SD	
Emotion control	1.60078	0.5122	1.8942	0.6321	0.793
Concept of mental health	2.2002	0.6055	2.4210	0.6578	1.105
Self-awareness	2.0621	0.5287	2.3612	0.5982	0.874
Iterpersonal relationship	2.1089	0.6055	2.3226	0.7326	1.312
Personality psychology	1.8254	0.5834	2.0412	0.6398	1.357
Learning psychology	1.8921	0.6224	2.3267	0.8216	1.559

7. Conclusion

This paper analyzes the concept of information grain, explores the research, and implements an emotion calculation model based on information grain by using the theory of grain computing, constructs an emotion knowledge base, and tests the significance index of the model by using multivariate linear regression. The students were divided into the experimental group and the control group before the beginning of the experiment. The pre-test results of the two groups of students in the mental health concept of the index of the highest value, the experimental group is 2.2002, and the control group is 2.1400. The mid-test results scores have been improved, and the experimental group of the mental health concept scores an index of 2.2405 and an index T-value of 0.853. The results of the post-test results of the experimental group In the post-test results, the overall scores of the experimental group were improved, and the highest value of mental health concept was 2.4210, which was higher than that of the control group of 2.1000. Therefore, because of the problems found in college students' psychoeducation, practicable countermeasures and suggestions for college students' psychoeducation based on the model of affective computing are put forward. The relevant ideas of affective computing can be reflected in psychological education, which can also make psychological education better perform its function and realize the ultimate value goal.

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