Hindawi
Mathematical Problems in Engineering
Volume 2022, Article ID 6384369, 11 pages
https://doi.org/10.1155/2022/6384369

Research Article

Teaching Quality of College Students' Mental Health Based on Mathematical Programming Algorithm

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Received 25 April 2022; Revised 24 May 2022; Accepted 13 June 2022; Published 15 July 2022

Academic Editor: Sagheer Abbas

During the evolution of the twenty-first century, the increase in people's material life level has also brought an increase in mental stress. For college students, not only need to bear heavy academic pressure, but also face the market competition after entering the society. Therefore, the psychological fitness instruction for undergraduate students has become an inseparable part of college education. However, in the current stage of mental health education, the quality of teaching is often difficult to guarantee. For the purpose of promoting the in-depth implementation of mental health education in colleges and universities and improving teaching effectiveness, one needs to analyze the quality of teaching in great details and understand the factors affecting the quality of teaching. In this paper, the mathematical programming algorithm is used to analyze the quality of college students' Psychological Wellness Instruction. It deeply studies the development status of psychological wellness training and the basic composition and algorithm principle of mathematical programming algorithm. It integrates it into the practice of teaching quality analysis on the basis of linear regression algorithm theory. The experimental results show that the highest confidence interval of teachers' teaching organization, cognitive level, and students' participation level in the mental health course has reached more than 80.00%. This shows the importance of these three factors to the improvement of teaching quality. In order to enhance the quality of college students' psychological wellness training, it is necessary to innovate the form of classroom organization and the degree of interaction between students and the classroom.

1. Introduction

As the age of technology continues to advance, complex information and data are flooding the growth and study life of college students. Under such an environment, college students are under enormous hidden pressure, and their mental health development is not optimistic. To alleviate this situation, higher education organizations in various regions have launched psychological wellness training programs designed for undergraduate students. As a significant element of the university curriculum system, it is one of the most crucial tasks in the current pedagogical events to undertake focused psychological wellness training for undergraduates, improve their positive and healthy values, and facilitate their harmonious body and mind growth. Therefore, it is of great relevance to effectively analyze the current quality of teaching psychological wellness to undergraduates. However, in the current stage of teaching quality analysis, if teachers only evaluate students' learning effects and mental health status, it will be a huge task and cannot guarantee accuracy. It is necessary to extract effective information from these huge data for accurate quality analysis. Mental health teaching data tends to correlate a lot of complex information beyond just looking at scores. This is very urgent for the follow-up teaching plan and teaching content to provide more scientific value decision-making for colleges and universities to carry out effective college students' mental health education and teaching activities.

Mathematical programming is an important subject theory in modern mathematics. Its basic idea appeared in the

nineteenth century, and it was widely concerned and applied with the in-depth development of computer technology in the late 1940s. Now, its methods and theories have gradually penetrated into the solution of various scene problems in people's daily work and life. For example, it has played an important application value in the fields of digital communication, urban construction, financial management, and business applications. It can find effective information in complex data scenarios and analyze it. Applying it to the quality analysis of college students' psychological wellness training can effectively excavate the factors that affect the effect of psychological wellness training, which has practical significance for promoting college students' psychological wellness training.

This paper analyzes the factors that affect the quality of mental health teaching at this stage by combining mathematical programming algorithms. According to the experimental data, it can be found that teachers' mastery of teaching content is a relatively objective factor. Its performance is not outstanding in the analysis of support, confidence, and correlation, while the teaching organization and student participation have obvious effects on the quality of mental health teaching. The mean values of support levels are 11.27% and 17.34%, respectively, in the data analysis of confidence and correlation. We found that the level of teaching organization also has an intuitive and important impact on teaching quality. Its confidence level can reach 92.14%, and the mean correlation degree has also reached 0.738. This also shows that improving the teaching quality of college students' mental health can focus on these aspects.

2. Related Work

Numerous academics have conducted in-depth studies on the analysis of teaching quality over the years. Tho used a qualitative comparative analysis of signal frames and fuzzy sets to allocate the effect of satellite data on the system integration. He focused on the pedagogical inputs of signal uniformity, signal sharpness, and signal dependability on the instructional level of teaching experience of MBA faculty [1]. Mbise investigated the effect of professional accreditation in information technology on the quality of teacher teaching in higher education institutions in Tanzania. He used qualitative content analysis in his research to investigate this [2]. Tian et al. explored a new set of valid initiatives to enhance the laboratory class instruction quality, and strived to cultivate dentistry graduates' observation, thinking, interpretation, and resolution proficiency [3]. On the basis of traditional TOPSIS method and intuitionistic fuzzy set, Liu designed a novel IF-TOPSIS algorithm with intuitive distance based for analyzing and assessing the performance of physical education teaching and learning [4]. Li et al. provided an in-depth analysis of the existing trends and challenges in the issue of instructional excellence in elementary and high school in the Northeastern region of China. He also showed through research studies for remarkable variations by gender, first education, position, scholastic level, and district [5]. Zhao and Chen analyzed the instructional level of university mathematics according to the fuzzy integrated assessment approach. He believed that the integration of college physics teaching and information technology has solved many problems that cannot be solved by the traditional teaching models [6]. The analysis of teaching quality has been deeply researched by countless scholars, and it has developed relatively maturely in the field of education at this stage. However, with the continuous development of education and the continuous reform of educational goals, its requirements for teaching quality analysis are also constantly improving. In order to meet the development of the times, it has become a more intelligent choice to integrate mathematical programming algorithms into teaching quality analysis.

In order to gain an in-depth understanding of the mathematical programming algorithm, this paper investigates its related application research. Ceselli et al. solved the combinatorial optimization problem of spatial information hiding based on the mathematical programming algorithm. He also priced in a multi-branch version of the exact branch and price algorithm [7]. Strub et al. introduced the problem of data assimilation in two-dimensional shallow water flows using mathematical programming algorithms. He also studied the sensitivity of the algorithm to the number of drifters, low or high flow, and temporal sampling frequency [8]. Huguet et al. proposed an efficient mathematical programming algorithm for computing several invariant objects of Hamiltonian dynamics. The algorithm does not require the system to be represented in terms of action angle variables, nor does it require it to be close to integrable and supported by strict posterior bounds [9]. Frascaria and Olver proposed a mathematical programming algorithm for natural optimization problems to minimize the average total cost of all users. He also demonstrated the optimal setting of tolls on an algorithmic basis [10]. Cannelli et al. proposed a new asynchronous parallel block descent algorithm framework. It is used to minimize the sum of smooth nonconvex and non-smooth convex functions, subject to both convex and non-convex constraints [11]. Gao and Zhang explored a novel block-structure convex optimization model through a mathematical programming algorithm. The block variables in it are not separable in the target, and they are further coupled linearly in the constraints [12]. These studies provide a good analysis of mathematical programming algorithms. With the rapid development of the times, intelligent algorithms have expanded from relatively professional technical fields to educational and teaching activities. There are very few existing studies focusing on the analysis of teaching quality, so it is urgent to analyze the teaching quality of college students' mental health based on the mathematical programming algorithms.

3. Mental Health Teaching Quality and Mathematical Programming Algorithm

3.1. The Quality of Mental Health Teaching. Improving the quality of psychological wellness instruction has always been a critical factor in the nation's well-being. For enhancing the goal of psychological wellness instructional quality, it is necessary to first understand the elements that shape the

pedagogical process. Only then can we improve and strengthen pedagogy according to the current shortcomings and issues. At present, the most important problems exist in the aspects of educational thought and teaching concept, teachers' level, and teaching evaluation methods.

At present, the work of colleges and universities is largely focused on the scientific research and discipline construction. Faculty also strives for achievement in the research projects and publication of academic papers. There are some views that the strengthening of mental health education and teaching is a soft task, not challenging, and not as severe as the scientific research. The status and role of college students' mental health education and teaching in social development have not formed a high degree of understanding. Mental health education is an important manifestation of the teaching level in colleges and universities, and it is also the starting point for cultivating high-quality talents. The current undergraduate training model is not innovative enough. The test-oriented education model implemented is not conducive to innovation, and the one-way inheritance of education is fully exerted. The teaching method is single, and many colleges and universities are currently implementing the ancient tradition consciously and unconsciously. Students' sound psychological quality should be cultivated. In order to integrate with the society, the original training mode must be changed. Practical teaching can change this model. Through scientific experimental teaching management, we can truly understand the shortcomings and interests of students, and cultivate excellent students. This is conducive to the cultivation of students' comprehensive quality.

Teacher level is also one of the key factors affecting the quality of mental health teaching. There are many factors in the evaluation of teachers' level, both subjective and objective. Subjective aspects: teachers' sense of responsibility, professional ethics, and attitude issues. Objective aspects: teachers' educational level, teaching level, and self-ability issues, etc. These will cause factors that affect the quality of teachers. Therefore, it is necessary to evaluate the teacher's level through online teaching evaluation, and analyze the main factors affecting the teacher's level.

The evaluation of teachers' teaching quality is an important part of the construction of the school's mental health education system. It is also an important procedure to promote the in-depth development of mental health education. The current teaching evaluation is mostly teacher evaluation. Most of the traditional teacher evaluation is to evaluate and analyze teachers' previous teaching performance and teaching effectiveness, and to screen based on students' learning results and teachers' professional ability. It thus realizes the structured and systematic management and restriction of teachers. The previous teaching evaluation methods have some limitations in terms of evaluation content, evaluation concept, and so on. Its main performance is shown in Table 1:

Correct teaching evaluation methods can play an appropriate adjustment and promotion role in the whole teaching process. It can provide practical guidance and suggestions for teachers' teaching. It is not only a key way to evaluate the effectiveness of teaching work, but also an effective guarantee to assist the implementation of the educational management system in colleges and universities. With the continuous development of computer science and technology, the application of algorithm technology to the evaluation of mental health teaching is an inevitable trend of development. This has brought unprecedented revolutionary changes to teaching evaluation. Using scientific means to conduct effective teaching evaluation provides scientific basis and effective decision-making for teaching managers.

At present, students' mental health test scores are still a major indicator of teaching quality assessment. Students' experimental courses are of course no exception, which still need to be assessed on the basis of grades. Only through scientific performance management and analysis can the information useful to improve the quality of education and teaching be truly mined. It is necessary to use the existing data to convert these management data into useful knowledge to better improve the teaching level and quality of teachers. It uses mathematical programming algorithms to convert students' existing grade data into information needed for teaching. And it can process and analyze the teaching data accurately. It excavates hidden laws from massive information, discovers factors that are highly related to scene problems, and can grasp students' learning dynamics.

The experimental course grades are an important part of the college students' mental health course standards. It not only assesses the students' real knowledge of mental health, but also is a key test for colleges and universities in cultivating talents with sound psychological quality. It corrects the bad mental state of the students in time. It can overcome the injustice and non-objectivity of teachers' subjective evaluation and relieve teachers' work. Academic performance not only examines the learning effect of students, but also examines the teaching quality of tired teachers. It is conducive to urging students to improve their learning effects, and is more conducive to teachers' self-examination of teaching effects. It is a kind of information that can be reflected in the teaching process, provide information for educational research, and serve for educational and teaching decision-making. The average level of achievement represents the overall mastery of the students' theoretical knowledge of mental health education. Higher than the average value indicates that the student basically meets the requirements of the course standards, and lower than the average value indicates that the student needs to continue to work hard. It can provide scientific and oriented information and data for teaching, and provide objective support for improving the teaching management.

At present, most of the colleges and universities still use manual student evaluation in the quality analysis of mental health teaching. The grade analysis is just a simple statistics of the grades of each class. The calculation of the average score, the highest score, the lowest score, and the statistics of each score segment is shown in Table 2.

During the evaluation period of students' evaluation, those who participate in the evaluation should send the evaluation questionnaire to the students. Students score

Table 1: The main problems and performance of traditional teaching evaluation methods.

Score	Sequence	Main performance
Traditional teaching evaluation methods	1	The content of the evaluation is very simple and lacks extensiveness.
	2	The utilization rate of evaluation results is very low, usually only the quantitative evaluation results of teachers are queued for evaluation, and in-depth statistical analysis of quantitative results is rarely carried out.
	3	The evaluation method is relatively monotonous and lacks scientificity.

Table 2: Analysis of psychological health achievements in colleges and universities.

Score	Sequence	Project
Mental health performance analysis	1	Average score
	2	Highest score
	3	Lowest score
	4	Each fraction

according to the situation, and finally make manual statistics on the teaching evaluation questionnaire. The workload of statistics is very large, and printing the teaching evaluation questionnaire requires a lot of expenses and wastes a lot of resources. This not only takes up the time of teachers and students, but also affects the normal teaching order of the school. The traditional teaching evaluation only makes simple statistics on several limited indicators in the evaluation questionnaire, which is a one-sided statistics. Such statistical results often lack objectivity and impartiality, and sometimes the teaching evaluation results do not reflect the true teaching level of teachers.

In the analysis of students' performance, the substitute teacher counts the number of each subsection one by one in the score sheet, finds the highest and lowest scores, and finally calculates the average, excellent rate, and failure rate. These jobs are actually a waste of time and have no use value and meaning. These data cannot tell anything. It cannot tell the teacher why that student's grade is so high or why it is so low. There is no relationship between these data. The basic structure of a college mental health report card is shown in Figure 1:

Based on the emergence of the above problems, a set of effective and feasible solutions must be developed to solve the problems encountered in the analysis of teaching quality. It no longer uses the original analytical method. It designs an online teaching evaluation module in the teaching management information system. Students only need to log in to their own accounts during recess to evaluate and score teachers online. In this way, the normal class time of the students will not be affected, and the teachers who participate in the evaluation of the teaching will not have to work so hard. They just need to check the evaluation results online at a specific time. This not only saves resources but also does not affect the normal teaching order, and solves practical problems. It processes the result data of teaching evaluation, and obtains the relationship between each evaluation index. It uses mathematical programming algorithms to analyze the strength of the relationship between teaching effects and indicators, and find out the indicators that really affect the mental health teaching. Through these factors, it can guide teachers to play the advantages and correct the shortcomings in teaching, so as to achieve better teaching effect.

3.2. Concept and Classification of Mathematical Programming Algorithms. Mathematical programming is to find the best and scientific method from different schemes when solving difficult problems. At the beginning of the last century, the global industrial production process accelerated, and the rapid improvement of the economic level led to the introduction of many mathematical programming ideas and algorithms. Under the continuous research of many scholars, these ideas and algorithms have been formed into a systematic theoretical discipline, and have become an important branch theory in the application of algorithms today. It continuously integrates with all walks of life and promotes common development. Mathematical programming refers to the minimization or maximization of single-objective or multi-objective problems with n variables. And these variables may also be subject to some constraints, as shown in Figure 2:

Its basic mathematical expression is [13]:

$$\min f(x), \quad x \in R^n, \tag{1}$$

$$s.t.\ c_i(x) = 0, i = (1, 2, \ldots, l), \tag{2}$$

$$c_i(x) \le 0, i = (l+1, l+2, \ldots, l+n), \tag{3}$$

min means seeking the minimum value, and $s.t.$ = subject to means limited. x is an n-dimensional vector with $x_1, x_2, \ldots, x_n$ elements. In formula, $c_i(x) = 0, c_i(x) \le 0$ is the objective function, and $f(x)$ is called the constraint condition. If the maximum value is sought, then only $\min(-f(x))$ is required, and the inequality constraint is replaced by $c_i(x) \ge 0$, which is equivalently converted to $-c_i(x) \le 0$.

In formulas (1)–(3), if both $f(x)$ and $c_i(x)$ are linear, then the resulting program is a linear program. If the constraints are removed, we get [14]:

$$\begin{aligned} &\min f(x), \\ &x \in R^n. \end{aligned} \tag{4}$$

Formula (4) is called an unconstrained optimization problem. The relative formulas (1)–(3) are called constrained optimization problems. As shown in Figures 3 and 4:

The regression analysis is a new type of algorithm idea which is further generated in the basis of the correlation analysis algorithm. This method is often used to calculate quantitative representations of causality. It seeks to model

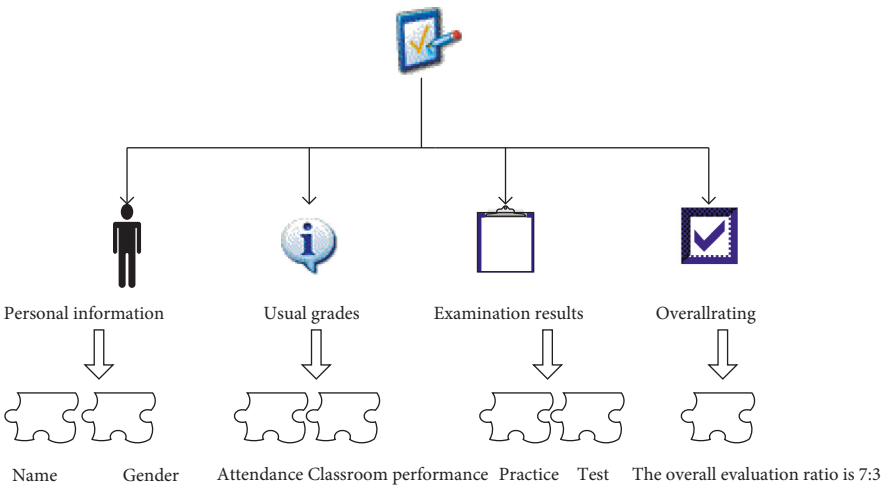

Figure 1: College mental health transcript basic structure.

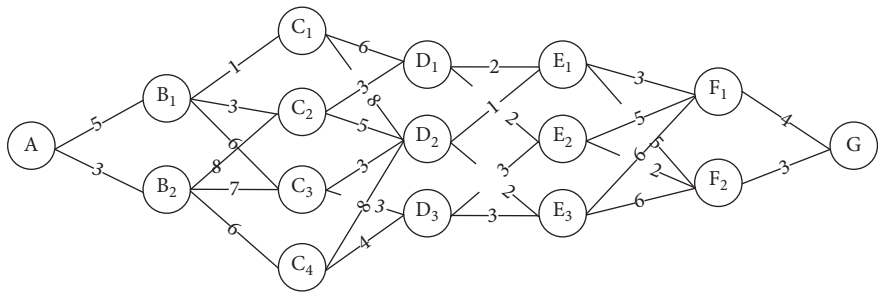

Figure 2: Mathematical programming theory legend.

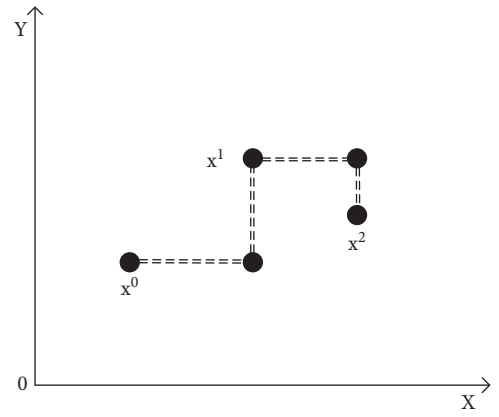

Figure 3: Unconstrained optimization problem.

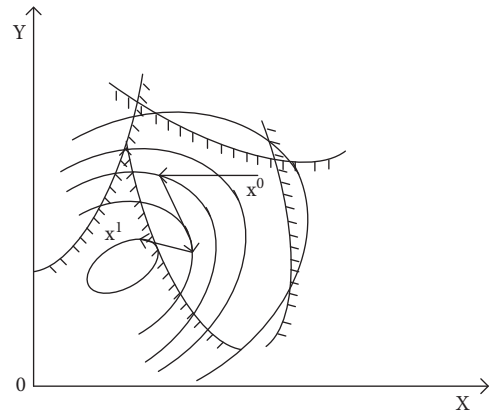

Figure 4: Constrained optimization problem.

the degree of association between variables and to form a certain calculation formula. That is, the functional relationship is used to express the changing relationship between variables, and estimates and predictions are made according to such a relationship. Through regression analysis, it is possible to standardize the generalization and a series of quantitative relationships that do not have a regular composition among the variables, and derive and estimate the dependent variable according to the quantitative relationship.

We set the formula to be a k-element linear formula, as shown in Figure 5, and design n independent variables. If independent variable x and dependent variable y have n sets of observation data series, the formula is expressed as:

$$x_{1t}, x_{2t}, \ldots, x_{kt}, y_t t = 1, 2, \ldots, nn > k. \quad (5)$$

Then, the determination of the k-element linear empirical regression formula can be attributed to the problem of determining the coefficient $b_0, b_1, \ldots, b_k$ of the parametric regression formula according to the observational data.

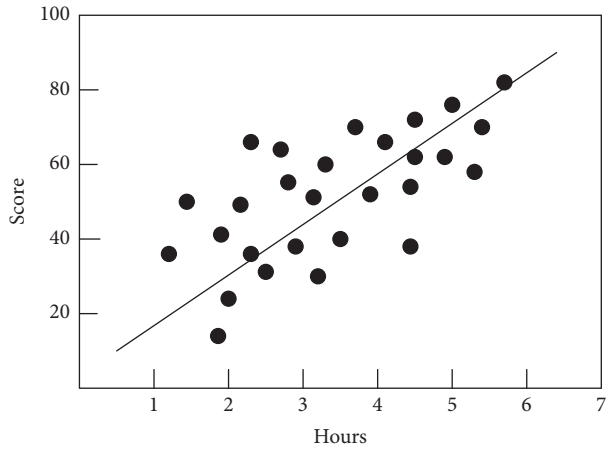

Figure 5: k-element linear regression formula legend.

It assumes that the estimated value of dependent variable y_t is

$$\widehat{y}_t = b_0 + \sum_{i=1}^{k} b_i x_{\mathrm{it}}. \tag{6}$$

In formula (6), if $\widehat{y}$ is used to represent x_{k+1}, according to the principle of least squares, the formula [15] can be obtained:

$$\begin{bmatrix} s_{11} & s_{12} & \cdots & s_{ik} \\ s_{21} & s_{22} & \cdots & s_{2k} \\ \cdots & \cdots & \cdots & \cdots \\ s_{k1} & s_{k2} & \cdots & s_{kk} \end{bmatrix} \begin{Bmatrix} b_1 \\ b_2 \\ \cdots \\ b_k \end{Bmatrix} = \begin{Bmatrix} s1_{(k+1)} \\ s2_{(k+1)} \\ \cdots \\ s_{k(k+1)} \end{Bmatrix}. \tag{7}$$

Formula (7) can be abbreviated as:

$$\left[s_{ij}\right]\{b_i\} = \left\{s_{i(k+1)}\right\}. \tag{8}$$

If $[s_{ij}]$ is invertible, the formula has only one solution:

$$\{b_i\} = \left[s_{ij}\right]^{-1}\left\{s_{i(k+1)}\right\}. \tag{9}$$

Then,

$$b_0 = \overline{y} - \sum_{i=1}^{k} b_i \overline{x}. \tag{10}$$

Therefore, according to the observation data $x_{1t}, x_{2t}, \ldots, x_{kt}, y_t t = 1, 2, \ldots, nn > k.$, the linear regression formula can be obtained:

$$\widehat{y} = x_{k+1} = b_0 + \sum_{i=1}^{k} b_i x_i. \tag{11}$$

On the basis of correlation analysis, it uses linear regression to find the best combination of indicators and obtains the influence coefficient. Here, the average grade of students' courses is used as the dependent variable, and the individual teaching evaluation indicators are used as the independent variable. It mainly includes serious and responsible teaching, rigorous teaching attitude, attention to communication with students, concise expression of interactive situations, vivid language, moderate speed of speech, clear demonstration and explanation, thorough analysis, easy to understand, reasonable use of various teaching methods, good classroom discipline, good atmosphere, attention to inspiration, promotion of thinking, ability to cultivate dignified manners, natural and generous.

When we want to solve a problem, we usually study the properties or conditions that the solution of the problem should have before solving it, so as to broaden the thinking for finding a solution method. So, we first discuss the problem of unconstrained optimization conditions.

For unconstrained optimization problems, we usually define it as any $x \in R^n$ (R^n means n-dimensional vector space) with:

$$f(x^*) \le f(x). \tag{12}$$

Then, x^* is called the global optimal solution of f, and it can also be called the global minimum. As shown in Figure 6, if both are strictly true for $x \in R^n$ and $x \ne x^*$, then x^* is called a strict global minimum of f.

If for any:

$$x \in N(c, \delta) = \left\{x \in R^n \middle| \left\|x - x^*\right\| < \delta\right\}. \tag{13}$$

There

$$f(x^*) \le f(x). \tag{14}$$

It is assumed that $f(x)$ is first-order continuous and differentiable on region D. If $x^* \in D$ is a local minimum of an unconstrained optimization problem, then there must be $g(x^*) = 0$.

Proof: It takes $x = x^* - \alpha g(x^*) \in D$, where $\alpha > 0$ is a constant, then:

$$\begin{aligned} f(x) &= f(x^*) + g(x^*)^T (x - x^*) + o(x - x^*) \\ &= f(x^*) - \alpha g(x^*)^2 + o(\alpha). \end{aligned} \tag{15}$$

It can be seen from formula (15) that $f(x^*) \le f(x)$, and because the assumed α is a number greater than 0, so:

$$0 \le g(x^*)^2 \le \frac{o(\alpha)}{\alpha}. \tag{16}$$

It makes $\alpha \longrightarrow 0$ available:

$$g(x^*) = 0. \tag{17}$$

It assumes that $f(x)$ is second-order continuously differentiable on region D. If $x^* \in D$ is a local minimum of unconstrained optimization problem, there must be $g(x^*) = 0$, and $G(x^*)$ is a positive semi-definite matrix.

Proof: It assumes that x^* is a local minimum, then $g(x^*) = 0$ can be known from the theorem. So, it only needs to prove whether it is a semi-positive definite matrix.

It takes $x = x^* + \alpha\, d \in D$ arbitrarily, where $\alpha > 0$ and $\mathrm{d} \in \mathrm{R^n}$ are obtained by Taylor expansion:

$$f(x) = f(x^*) + \frac{1}{2}\alpha^2 d^T G(x^*) + o\left(\alpha^2\right). \tag{18}$$

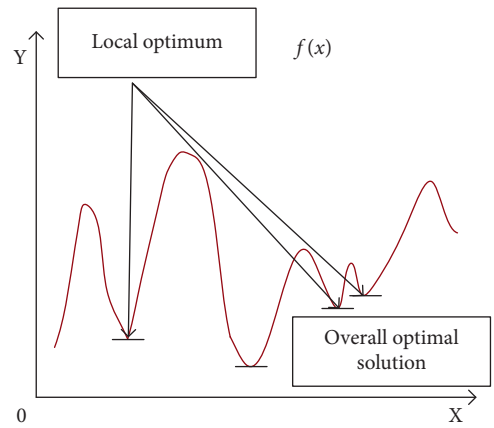

Figure 6: Global optimal solution and optimal solution problem.

Then,

$$0 \le f(x) - f(x^*) = \frac{1}{2}\alpha^2 d^T G(x^*) + o(\alpha^2),$$
$$d^T G(x^*)d + o\left(\frac{2\alpha^2}{\alpha^2}\right) \ge 0. \tag{19}$$

It makes $\alpha \longrightarrow 0$ get $d^T G(x^*)d \ge 0$, that is, $G(x^*)$ is a semi-positive definite matrix.

It is assumed that $f(x)$ is second-order continuously differentiable on region D. If $x^* \in D$ is satisfied $g(x^*) = 0$ and $G(x^*)$ is a positive semi-definite matrix, then x^* is a local minimum of the unconstrained optimization problem.

Prove: When $x = x^* + \alpha\ d \in D$, where $\alpha > 0$ and $d \in R^n$, it is obtained by Taylor expansion:

$$f(x^* + \alpha\ d) = f(x^*) + g(x^*)^T d + \frac{1}{2}\alpha^2 d^T G(x^* + \theta\alpha\ d)d. \tag{20}$$

Among them $\theta \in (0, 1)$, and $g(x^*) = 0$ is known from the condition. The latter item is greater than or equal to 0, that is:

$$f(x^* + \alpha\ d) \ge f(x^*). \tag{21}$$

4. Experimental Results and Analysis

This article analyzes the teaching quality of mental health courses of five teachers in a university. Before the experiment, the teacher's personal information and the students' mental health theoretical and practical course scores (The full score is 100 points) were collected, as shown in Tables 3 and 4:

It can be seen from Tables 3 and 4 that the five teachers have different teaching years and the course grades of the students in their classes, and there is no positive correlation. It can be seen that teaching age does not have much correlation with the level of teaching quality. Therefore, in order to carefully study the teaching quality of each teacher and analyze the factors that affect the quality, this paper uses the linear regression algorithm and understands the teaching

Table 3: Teacher's personal information.

Test object	Age	Teaching age
Teacher 1	26	2
Teacher 2	34	8
Teacher 3	29	5
Teacher 4	42	14
Teacher 5	56	23

implementation of the mental health course. It evaluates and analyzes from the teaching content, teaching organization, cognitive level, and student participation of the mental health course. The algorithm evaluation method is carried out using a score system. It evaluates the teachers' performance by comparing the various comprehensive factors. The full score is 10 points, and the higher the score, the better the teaching quality. Finally, the analysis results and the actual situation are investigated for support, confidence, and correlation. The survey results are shown in Figures 7–10:

4.1. Teacher Performance Level. As can be seen from Figure 7, according to the analysis of the linear regression algorithm, in terms of the understanding of the teaching content of the mental health course, each teacher has achieved a score of 8.2 or more. In terms of teachers' cognitive level, each teacher's level has reached 8.45 or more. There is little difference in the performance of the five teachers in teaching content and cognitive level, because teacher selection has a high demand for teachers' personal education and professional matching. Each teacher has a better understanding of the content of the mental health course, and their personal cognitive level belongs to a higher level. In the analysis of the two aspects of teaching organization and student parameters, there are obvious differences. We can see that the highest score of teacher organization is 8.74, the lowest is 7.93, and the highest score of student participation is 8.74, and the lowest is 7.27. This is related to the professional quality and teaching methods of teachers.

4.2. Support Analysis. It can be seen from Figure 8 that in the analysis of the support degree of teaching content and teaching organization, the support degree of teaching organization is significantly higher than that of the teaching organization content. The mean support for teaching content was 7.94%, while the mean support for organizations was 11.27%, with a difference of 3.33%. In the analysis of cognitive level and student participation support, the support level of student participation is significantly higher than the cognitive level. The support degree of student participation under linear programming analysis is 17.34%, while the average support degree of cognitive level is 6.18%, and the difference is 11.16%. This shows that the results of teaching content and cognitive level in the analysis of mental health teaching quality are relatively the same, which is not significant.

Table 4: Student mental health course grades.

Test object	Class size	Average score for theoretical courses	Practical course average
Class 1	42	82.32	81.21
Class 2	39	78.19	80.17
Class 3	46	76.57	79.22
Class 4	35	79.14	79.63
Class 5	40	81.36	83.51

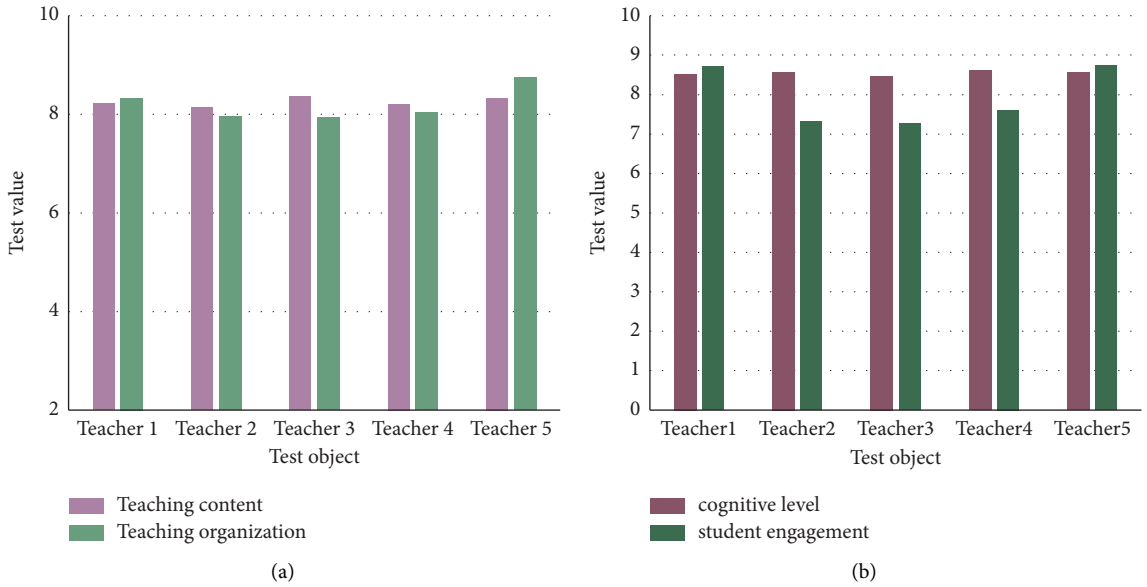

Figure 7: Mental health course teaching performance. (a) shows the teaching content and teaching organization performance. (b) shows cognitive level and student participation performance.

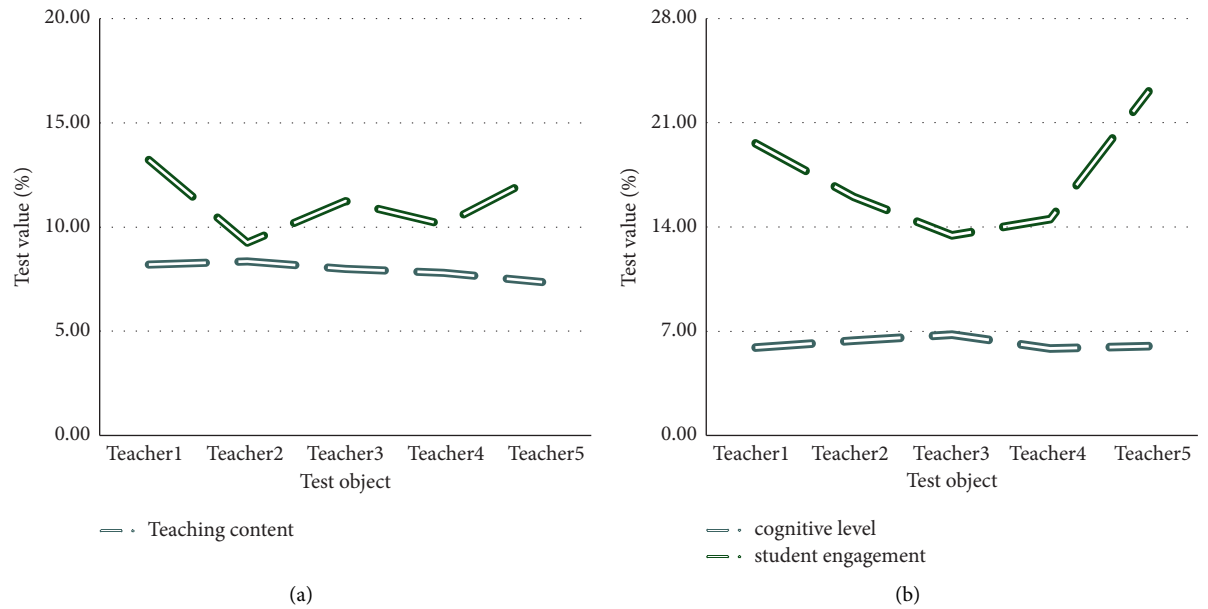

Figure 8: Teaching quality support calculation. (a) shows the teaching content and teaching organization support. (b) shows cognitive level and student participation support.

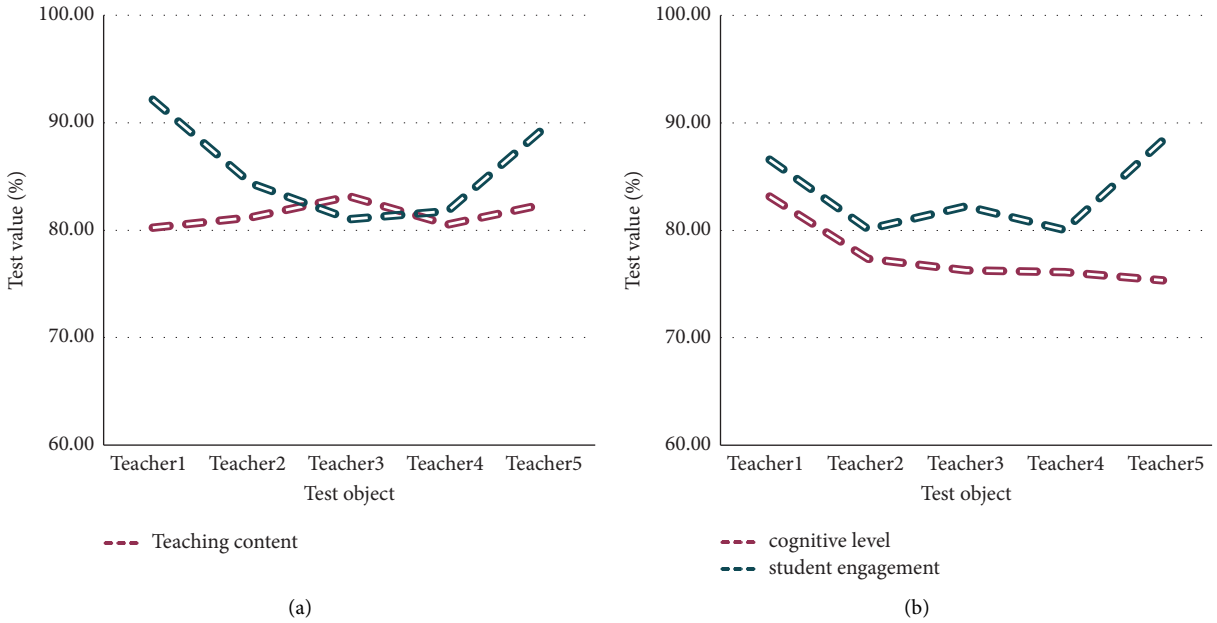

Figure 9: Teaching quality confidence calculation. (a) shows the teaching content and teaching organization confidence. (b) shows cognitive level and student participation confidence.

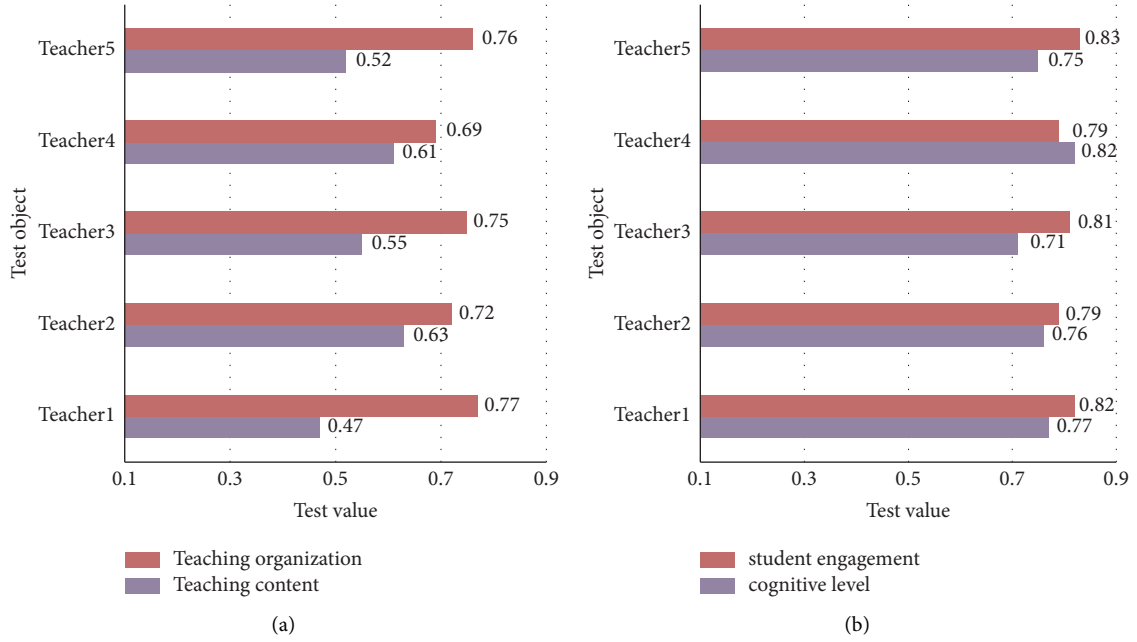

Figure 10: Teaching quality relevance calculation. (a) shows the correlation between teaching content and teaching organization. (b) shows the correlation between cognitive level and student participation.

4.3. Confidence Analysis. It can be seen from Figure 9 that the confidence interval of the teaching content is between 80.23% and 83.14%, with a difference of 2.91%. Confidence intervals for teaching organizations ranged from 81.02% to 92.14%, with a difference of 11.12%. The confidence level of the cognitive level is the highest at 83.14% and the lowest at 75.34%, and the difference level reaches 7.8%. The confidence level of the student participation level is the highest at 88.37% and the lowest at 80.03%, and the difference level reaches 8.34%. In addition to the insignificant differences in teaching content, each teacher's confidence in teaching organization, knowledge level, and student participation varies greatly. This is also due to the strong individual subjectivity occupied by these three factors.

When teaching mental health to college students, in addition to being familiar with the objective teaching content, the way teachers convey mental health education to students, teachers' personal opinions, and the degree of

interaction with students are also important factors that affect the entire teaching process. If the performance in these three aspects is relatively satisfactory, the learning effect received by the students will not be very bad. Combining with the student achievement information in Table 4, we can also observe that the first teacher and the second teacher have a relatively large difference in age and teaching experience, but the students in the classes in charge have performed relatively well. A large part of the reason is that teachers do a better job in teaching organization, cognitive level, and student participation.

4.4. Correlation Analysis. It can be seen from Figure 10 that in the analysis of the teaching quality of mental health, the three major aspects of each teacher's classroom organization, the degree of internalization of mental health knowledge, and the interaction and practice of students are the most relevant on average. The analysis values of the average correlation degree are 0.738, 0.762, and 0.808, respectively, while the teaching content is only 0.556. These data can show that the teaching organization, cognitive level, and student engagement are closely related to the quality of college students' mental health teaching. Teachers making innovations and changes at these three levels are of great help to improve the quality of teaching.

In terms of teaching organization, teachers can carry out targeted teaching according to students' personal psychological quality and psychological state, and provide corresponding suggestions and assistance for students' weaker knowledge. In terms of cognitive level, before teaching, teachers themselves also need to have good psychological quality and establish a positive attitude. Teachers need to participate in teaching while ensuring their full understanding of the theoretical knowledge. In terms of student participation, mental health teaching should not be limited to the theoretical classrooms. Moreover, because it is related to real life, the teaching methods should be diversified, and students should be encouraged to interact and participate more in order to have a good teaching effect.

5. Conclusion

The quality analysis of mental health teaching plays an essential role in promoting the development of psychological teaching in institutions of higher education. In order to deeply analyze the psychological wellness instruction quality of college students at this stage, this paper uses mathematical programming algorithm to conduct a profound study on various factors that affect the teaching quality. It also provides corresponding suggestions for education and teaching on the basis of analyzing data. This solves the problem that accurate and effective analysis conclusions cannot be obtained due to the complexity of the data. By implementing the latest development of algorithm design, we believe that the efficiency of teaching quality analysis will be gradually improved. Although this paper has made a profound study on the quality of mental health teaching based on the mathematical programming algorithm, many inadequacies remain here. In the process of this research, the selection and acquisition of experimental data are carried out under absolutely ideal conditions, and the completeness and validity are not enough. It does not take into account some of the interference factors involved in the testing process. The scope and extent of this study is not deep enough. The scholarly standard of the author's studies is as well restricted, and the research on the application of algorithms in teaching quality analysis is still in the initial phase. Therefore, the author aims to make the study more in-depth and extensive. In the future, the author will continue to improve the quality of the research work by analyzing from additional points of view according to the foundation of available skill and capability.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflicts of interest.

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