Hindawi
Mobile Information Systems
Volume 2022, Article ID 8695575, 8 pages
https://doi.org/10.1155/2022/8695575

Research Article

Construction of the Mathematical Model for Teaching Classroom Evaluation in Colleges and Universities Using an Optimized Apriori Algorithm

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Received 28 June 2022; Revised 6 August 2022; Accepted 9 August 2022; Published 1 September 2022

Academic Editor: Muhammad Zakarya

In order to increase the effectiveness and teaching quality of numerous classroom activities in colleges and universities, this paper puts forward the effectiveness assessment technique of teaching activities in colleges, universities, and institutions of higher education based on the optimized Apriori algorithm. A mathematical model for assessing the efficacy and usefulness of classroom activities in colleges and universities is constructed. Teaching contents, teaching attitudes, teaching methods, teaching effects, test results, and students' performance are introduced as comprehensive evaluation factors, and a decision-making model for assessing the success and efficiency of classroom activities in colleges and universities is established by adopting scientific, reasonable, and systematic teaching methods. Through the grey correlation analysis of classroom teaching quality, the delay characteristic analysis and the adaptive parameter adjustment method are adopted. This paper constructs the optimal Apriori algorithm model of college teaching classroom activities, constructs the optimal evaluation function model of college teaching classroom activities effectiveness evaluation by the method of support-confidence joint estimation, extracts the optimal quality parameter set of college teaching classroom activities by the optimization detection method and association rule mining, and realizes the effectiveness evaluation and multi-dimensional parameter estimation of college teaching classroom activities by the optimized Apriori algorithm. The test outcomes confirm that this technique is reliable in evaluating the effectiveness of classroom activities in colleges and universities, and the directional distribution of association rules of classroom quality in colleges and universities is significant, which meaningfully advances the classroom teaching levels and quantitative evaluation abilities.

1. Introduction

The effectiveness evaluation of teaching activities in colleges and institutions of higher education is the key to improve the quality of teaching activities. By adopting the quantitative index analysis method, this paper puts forward an effective assessment model of teaching accomplishments in colleges, universities, and institutions of higher education, analyzes the functional parameters of the effectiveness in evaluation of teaching accomplishments, and realizes the effectiveness evaluation and model parameter identification from different angles through different index parameter analysis [1]. In fact, this is of prodigious importance to increase the reliability and effectiveness of the effectiveness evaluation of teaching activities in colleges, universities, and institutions of higher education and to study the effectiveness evaluation methods of teaching activities in colleges and academies, so as to enhance the management of teaching activities and encourage the teaching reform in colleges and academia [2].

From the selection purpose of effectiveness assessment of teaching classroom activities in colleges and academies, the function of effectiveness evaluation of teaching classroom undertakings in colleges and academies can be expressed as follows: (i) the function of qualification appraisal, that is, the qualification standard is an important starting point to distinguish between qualified and unqualified ones; (ii) the evaluation of the effectiveness of teaching events in colleges and institutions of higher education also has the function of advanced selection, that is, the evaluation of the usefulness of teaching events in colleges and academies can distinguish

the advanced from the backward and encourage the advanced and spur the backward; and (iii) the third is the evaluation of the effectiveness of teaching undertakings in colleges and academies, which has the function of checking and accepting teaching results, that is, the evaluation of the usefulness of teaching happenings in colleges and academies can realize the acceptance, development, and promotion of teaching results. From the viewpoint of the influence of teaching assessment on the teaching practice, the functions of effectiveness evaluation of teaching classroom activities in colleges and academies can be expressed as follows: (i) to realize the functions of teaching judgment, that is, measurement evaluation, fact judgment, value judgment, problem diagnosis, discrimination, and selection; (ii) through evaluating the effectiveness of college classroom activities, improving teachers' teaching quality, adopting the evaluation model of college classroom activities, fully understanding students' starting point behavior, improving college classroom activities and teaching ability, providing reference for the effectiveness evaluation of college classroom activities, remedying the basis of teaching defects, and ensuring the achievement of teaching objectives, it can be seen and well-understood that the effectiveness evaluation of college classroom activities is a scientific and systematic project [3].

The effectiveness evaluation of classroom activities in colleges and academies is the basic work to promote the optimization of classroom teaching quality. In fact, it is not only an imperative part of teaching quality monitoring in colleges and academies but also a complex systematic project. Due to the complexity, fuzziness, and multi-factors of the teaching phenomenon in the effectiveness evaluation of teaching accomplishments in colleges and academies, there is a problem with qualitative analysis and accuracy in the effectiveness evaluation of teaching undertakings. By constructing an optimized assessment model of teaching actions in colleges and academies, combining with the teaching quality evaluation of the classroom, the scientific, reasonable, and fair index parameter analysis technique are implemented to comprehend the effectiveness analysis and dynamic assessment of teaching events in colleges and academies, thus ensuring and steadily improving the teaching quality [4]. Generally, the evaluation index system for the effectiveness evaluation of classroom actions in institutions of higher learning should include two factors: (i) one is the index that can fully reflect the effectiveness and teaching quality of classroom accomplishments in institutions of higher learning; and (ii) the other is the weight of each index on the effectiveness and importance of classroom happenings in institutions of higher learning.

Many domestic experts and instructors have made in-depth research on the production of the evaluation index system of the effectiveness of teaching happenings in institutions of higher learning, which can be divided into two approaches: (i) the first approach is the traditional technique, through the expert system analysis of the effectiveness evaluation of teaching accomplishments in colleges and academies, through which the experts of teaching activities in institutions of higher learning and educational management institutions formulate questionnaires containing evaluation indexes and weights, that is, learners are the chief body. With the aim of students' satisfaction, the scoring table of college teaching classroom activities is compiled, the mathematical statistics method of college teaching classroom activities is realized according to the optimized scoring method, and the preliminary survey data is processed to obtain the index system items and weights that cannot be obtained intuitively. Through the evaluation and detection of the effectiveness of college teaching classroom activities, the integration and database construction of the quality constraint parameters of college teaching classroom activities are carried out. Among the traditional methods, the evaluation of the quality constraint parameters of college teaching classroom activities mainly includes the fuzzy PID evaluation method and the evaluation method of college teaching classroom activities based on fuzzy parameter detection. By analyzing the quality parameters of college teaching classroom activities, the effectiveness of college teaching classroom activities are performed. In [4], a design approach for the effectiveness of intelligent control of college teaching classroom activities is proposed, which combines the distribution characteristics of mobile Internet and data analysis technology in college teaching classroom activities and improves the effectiveness of college teaching classroom activities through big data fusion. However, this method is ambiguous and has poor detection performance [5].

Aiming at the above problems, in this paper, we suggest an evaluation method of the effectiveness of college teaching classroom activities based on the optimized Apriori algorithm. Firstly, a mathematical model for assessing the usefulness of classroom activities in institutions of higher learning is constructed, and the teaching content, teaching attitude, teaching methods, teaching effect, test results, and students' performance are introduced as comprehensive evaluation factors. Secondly, a decision-making model for estimating the efficiency of classroom activities in colleges and universities is established by adopting scientific, reasonable, and systematic teaching methods. Through the grey correlation analysis of classroom teaching quality, the delay characteristic analysis and the adaptive parameter adjustment method are adopted. This paper constructs the optimal Apriori algorithm model of college teaching classroom activities, constructs the optimal evaluation function model of college teaching classroom activities effectiveness evaluation by the method of support-confidence joint estimation, extracts the optimal quality parameter set of college teaching classroom activities by the optimization detection method and association rule mining, and realizes the effectiveness evaluation and multi-dimensional parameter estimation of college teaching classroom activities by the optimized Apriori algorithm. To end with, the simulation-based experiments and test analysis demonstrations confirm the greater performance of this approach in increasing the effectiveness evaluation aptitude of college teaching classroom activities. The fundamental ideas presented in this article are as follows:

(i) A mathematical model for appraising the effectiveness of classroom activities in institutions of higher learning is constructed.

(ii) A decision-making model for appraising the usefulness of classroom accomplishments in institutions of higher learning is established.

(iii) This paper constructs the optimal Apriori algorithm model of college teaching classroom activities and constructs the optimal evaluation function model of college teaching classroom activities.

(iv) The attained outcomes indicate that this approach is reliable in evaluating the effectiveness of classroom accomplishments in colleges and institutions of higher learning.

The rest of the paper contents are organized in the following way. The numerical investigation and feature extraction of effective indicators of classroom accomplishments in institutions of higher learning are elaborated in Section 2. Optimization of the effectiveness evaluation algorithm of teaching classroom actions in institutions of higher learning are discussed in Section 3. This section also talks over the proposed methods and algorithms in detail. Simulation tests and outcomes are deliberated in Section 4. Lastly, Section 5 summarizes the article and puts forward numerous guidelines and suggestions for future research.

2. Statistical Analysis and Feature Extraction of Effective Indicators of Classroom Activities in Colleges and Universities

2.1. Statistical Analysis of Living Quality Indicators in College Teaching Classes. In order to realize and understand the construction and mathematical design of the effectiveness evaluation model for college teaching activities, the first approach is based on the Web Service platform. Furthermore, in order to realize the effectiveness evaluation of college teaching activities, the second approach is based on the optimized Apriori algorithm [6]. Firstly, an effectiveness characteristic analysis model of college teaching activities is built, and a distributed information perception model of college teaching activities is built by combining the analysis of index parameters of college teaching activities, and the characteristic sequence analysis of the time series of quality constraint parameters of college teaching activities is comprehended by conjoining the fuzzy correlation analysis approach [6, 7]. The overall realization structure of effectiveness evaluation of college teaching accomplishments is given away in Figure 1.

According to the general structure model of distributed effectiveness evaluation of college teaching classroom activities, as shown in Figure 1, the hierarchical weighted combination structure model of college teaching classroom activities quality constraint parameters is assembled. Moreover, the hierarchical feature information fusion coefficient of college teaching classroom activities quality constraint parameters is given by $W = \{u, w_1, w_2, \ldots, w_k\}$. Under the control of steady growth trend mode, the statistical feature quantity of feature parameter fusion of college teaching classroom activities quality constraint parameters is characterized by w_{tj}. Assuming that M university teaching classroom activity quality constraint parameters are transmitted to the link layer in layers, the principle of combining expert evaluation with mass evaluation is adopted. Through block regional integration, the hierarchical combination scheduling form of university teaching classroom activity quality constraint parameters is given by $x(k-1), \ldots, x(k-M)$. Similarly, the configuration model of the university teaching classroom activity effectiveness differential integration parameters is given by $x_s = [x(\eta_1), \ldots, x(\eta_N)]^T$. In last, the estimated value of regional module characteristics of university teaching classroom activity quality constraint parameters stored in layers is obtained using the following equation:

$$\widehat{x}_s = W_s^T y, \tag{1}$$

where W_s^T is the joint decision-making parameter of the effectiveness of college classroom activities and y is the standard quantitative parameter of the quality constraint parameter of college classroom activities. A mathematical model of the effectiveness evaluation of college classroom activities is built, which takes teaching content, teaching attitude, teaching method, teaching effect, test results, and students' performance as comprehensive evaluation factors, adopts scientific, reasonable, and systematic teaching methods, establishes a decision-making model of the effectiveness evaluation of college classroom activities, and gets the effectiveness evaluation of college classroom activities based on the priority division method [7]. The index system of effectiveness evaluation of classroom activities in colleges, universities, and institutions of higher learning is given away in Figure 2.

The certain method is used to select the most critical factors as the evaluation indexes, and constructing the fusion characteristic parameter analysis model of the constraint parameters of teaching classroom accomplishments in colleges, academies, and institutions of higher learning is as follows in equations (2) and (3):

$$r(t) = \sum_i \sum_{j=0}^{N_f-1} \sum_{l=0}^{L-1} b_i \alpha_l p\left(t - iT_s - jT_f - c_j T_c - \tau_l\right) + \omega(t) = \sum_i \sum_{j=0}^{N_f-1} b_i p_h\left(t - iT_s - jT_f - c_j T_c - \tau_0\right) + \omega(t), \tag{2}$$

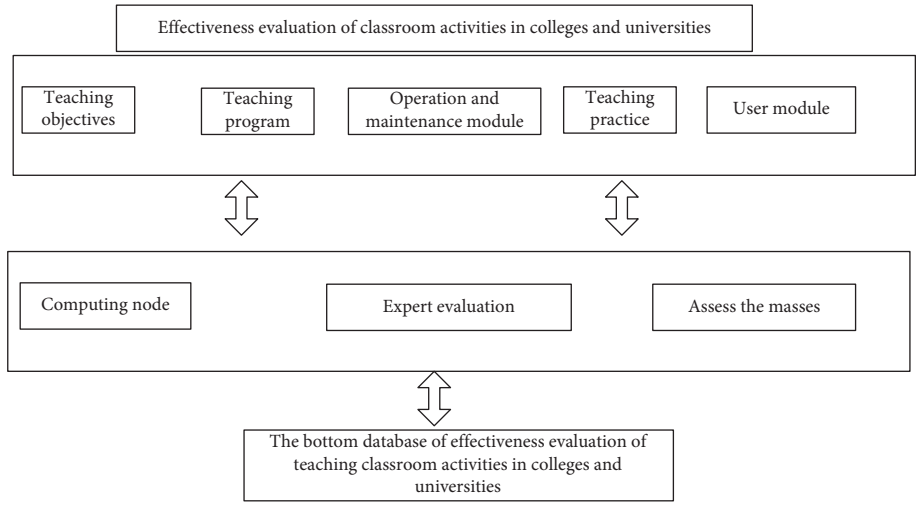

Figure 1: Overall implementation structure of effectiveness evaluation of distributed college teaching classroom activities.

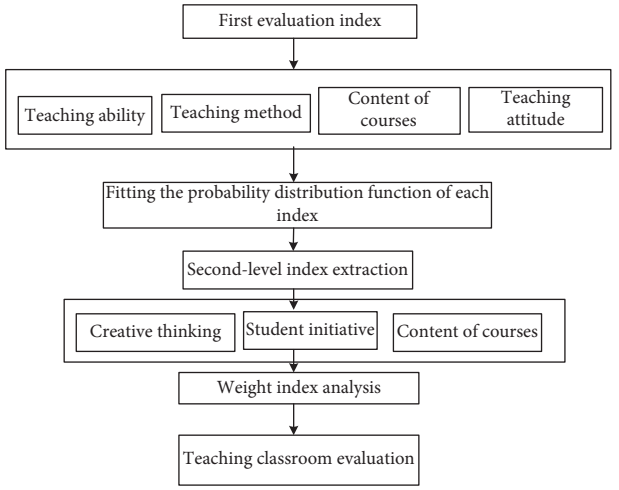

Figure 2: The Index system of effectiveness evaluation of classroom activities in colleges, universities, and institutions of higher learning.

where

$$p_h(t) = \sum_{l=0}^{L-1} \alpha_l p\left(t - \tau_{l,0}\right). \tag{3}$$

Furthermore, $\omega(t)$ is the dimension of hierarchical storage of quality constraint parameters of college teaching classroom activities and $p_h(t)$ is the joint feature distribution function of college teaching classroom activities. According to the above analysis, the weight of each index is determined and statistical analysis is performed to comprehend the effectiveness evaluation of teaching classroom activities in colleges and universities [8].

2.2. College Teaching Classroom Activity Quality Constraint Parameter Feature Extraction. Combining the fuzzy correlation analysis approach to comprehend the feature space structure reorganization of the time series of constraint parameters of college teaching classroom activities [9], and combining the analysis method of accumulating redundant parameters of college teaching classroom activities, a storage structure model of college teaching classroom activities quality distribution is created. Subsequently, the created model is improved through integrating the evaluation index system of college teaching quality and the fuzzy feature sampling information sample set of feature point i at t time is denoted as $(w_{1,j}, w_{2,j}, \ldots, w_{tj})$, whereas t represents the steady-state parameter of the characteristic distribution of the quality constraint parameters of college teaching classroom activities. Through spatial distributed grid matching, the block fusion judgment criterion of the quality constraint parameters, as given by two criteria denoted by equations (4) and (5), of college teaching classroom activities can be obtained:

Criterion (1):

$$\sqrt{\frac{R_{(m+1)n}^2 - R_{mn}^2}{R_{(m+1)n}^2}} = \frac{\left|x_{\eta(n)+m\tau} - x_{n+m\tau}\right|}{R_{(m+1)n}} \geq R_{tol}. \tag{4}$$

Criterion (2):

$$\frac{R_{(m+1)n}}{\sqrt{1/N \sum_{k=1}^{2} \left[x_k - 1/N \sum_{k=1}^{N} x_k\right]^2}} > A_{tol}, \tag{5}$$

wherein, x_k is the hierarchical combination sequence of effectiveness evaluation of college teaching activities, A_{tol} is the decision threshold of effectiveness evaluation of college teaching activities, and $x_{\eta(n)+m\tau}$ is the output delay of effectiveness evaluation of college teaching activities. Moreover, $x_{n+m\tau}$ is the spatial fusion parameter of effectiveness evaluation of college teaching activities, $R_{(m+1)n}$ is the N-order decision statistical variable of effectiveness evaluation data of college teaching activities, and R_{tol} is the convergence threshold, and the sparse and heterogeneous characteristic point set of the i^{th} constraint parameter of quality of college teaching activities is $P_i = (p_{i1}, p_{i2}, \ldots p_{iD})$. This should be noted that R_{mn} is the detection statistical distribution set of effectiveness evaluation of college teaching activities [10].

Combining the fuzzy correlation analysis approach to comprehend the feature space structure reorganization of the time series of the quality constraint parameters of college classroom activities [11] and combining the dynamic parameter analysis method, the hierarchical attribute feature quantity of the quality constraint parameters of college classroom activities is $\{u_1, \ldots u_N\}$. Based on the heterogeneous fusion of virtual spaces, the hierarchical fusion feature distribution set $\{v_1, \ldots, v_M\}$ of the effectiveness evaluation of college classroom activities is obtained, and through the semantic ontology fusion, the block detection feature quantity of the quality constraint parameters of college classroom activities is $R = [R_{u,v}]_{N\times M}$. According to the above analysis, the effectiveness evaluation and block detection of college classroom activities are realized [12].

3. Optimization of the Effectiveness Evaluation Algorithm of Teaching Classroom Activities in Colleges and Universities

3.1. Optimal Scheduling of Effectiveness Evaluation of Teaching Classroom Activities in Colleges and Universities. Through combining with the template feature matching approach, the weighting coefficients of the effectiveness evaluation of college teaching classroom activities are obtained [13]. Subsequently, the fuzzy similarity feature quantity of the effectiveness evaluation of college teaching classroom activities is established, and the statistical feature quantity of the distribution feature set of the effectiveness evaluation of college teaching classroom activities is calculated. Finally, the trust level of the effectiveness evaluation of college teaching classroom activities and actions is acquired as follows in the following equation:

$$I\text{Trust}_{a\longrightarrow c} = \frac{\sum_{b\in adj(a,c)} D\text{Trust}_{a\longrightarrow b} \times \left(D\text{Trust}_{b\longrightarrow c} \times \beta_d\right)}{\sum_{b\in adj(a,c)} D\text{Trust}_{a\longrightarrow b}}, \tag{6}$$

where β_d is the multi-port matching node of the effectiveness evaluation of college teaching classroom activities under the multi-dimensional feature distribution mode, D is the sample regression distribution set, and $\text{Trust}_{b\longrightarrow c}$ is the trust function of the effectiveness evaluation of college teaching classroom activities [14, 15]. According to the spectrum feature decomposition, calculate the parameter matching feature quantity of the quality constraint parameters of college teaching classroom activities and get the standard normal distribution of β_d. The analytical model of the joint autocorrelation constraint parameters for the effectiveness evaluation of college teaching classroom activities is as follows:

$$\beta_d = \frac{(MPDist - d + 1)}{MPDist, d \in [2, MPDist]}, \tag{7}$$

where $adj(a, c)$ represents the amount of output reconstruction feature vectors $a \longrightarrow c$ of the effectiveness evaluation of college teaching classroom activities. Considering a number of wide-ranging assessment indexes of the usefulness of teaching accomplishments in colleges and academies, the characteristic recombination model of the quality constraint parameters of teaching accomplishments in colleges and academies, the correlation mapping is expressed as $A \longrightarrow B$, $B \longrightarrow C$. This should be noted that the regression analysis model of the effectiveness assessment parameters of teaching activities in schools and institutions of higher education is as follows:

$$MSD_{a\longrightarrow b} = 1 - \frac{\sum_{i=1}^{|I_{a,b}|} \sqrt{\left(d_{a,i} - \overline{d}_a\right)^2 + \left(d_{b,i} - \overline{d}_b\right)^2}}{\left|I_{a,b}\right| \times \sum_{i=1}^{|I_{a,b}|} \left[\sqrt{\left(d_{a,i} - \overline{d}_a\right)^2} + \sqrt{\left(d_{b,i} - \overline{d}_b\right)^2}\right]}, \tag{8}$$

where $d_{a,i}$ is the adjustment parameter of the effectiveness evaluation of college teaching classroom activities, $\overline{d}_a$ is the supply chain parameter of the effectiveness evaluation of college teaching classroom activities, and $d_{a,i}$ is the characteristic quantity of block sample regression analysis of the effectiveness evaluation of college teaching classroom activities, using statistical analysis method [16, 17].

By using the analytical target cascading (ATC), the mutual information of hierarchical evaluation of the usefulness of teaching happenings in colleges and academies is as follows:

$$I(Q, S) = H(Q) - H(Q|S), \tag{9}$$

where

$$H(Q|s_i) = -\sum_j \left[\frac{p_{sq}(s_i, q_j)}{p_s(s_i)}\right] \log_2 \left[\frac{p_{sq}(s_i, q_j)}{p_s(s_i)}\right], \tag{10}$$

where $H(Q)$ is the cooperative probability magic parameter of the effectiveness evaluation of college teaching classroom activities and $H(Q|S)$ is the relevant probability density. Similarly, $p_{sq}(s_i, q_j)$ is the cooperative statistical parameter of the time series of the quality constraint parameters of college teaching classroom activities and $p_s(s_i)$ is the autocorrelation information component. Combined with the mutual information feature matching, the effectiveness evaluation of college teaching classroom activities is analyzed [18, 19].

Table 1: The descriptive statistical study outcomes of quality constraint parameters of college teaching classroom activities.

Sample set	Data size	Regression value	Quadratic fitting	Statistical value
Attendance rate	407	0.935	0.080	0.504
Classroom performance	408	0.963	0.689	0.303
Job completion	426	0.879	0.129	0.732
Teaching objectives and conditions	414	0.745	0.234	0.131
Evaluation scheme	413	0.786	0.638	0.904
Evaluator	423	0.528	0.523	0.478
Evaluation	411	0.460	0.642	0.990
Information materials	406	0.930	0.806	0.855
Synthetic judgment	427	0.236	0.914	0.346
Didactics	409	0.229	0.398	0.547
Classroom theory	408	0.387	0.174	0.703

3.2. Optimization of Effectiveness Evaluation of Classroom Activities in Colleges and Universities. The optimal Apriori algorithm model, in particular for college classroom activities, is created, and the optimal evaluation function model of the effectiveness assessment of college classroom activities is constructed by the method of joint estimation of support and confidence. The constraint parameter set of college classroom activities quality is obtained by the method of multiple evaluations $X = \{x_1, x_2, \ldots, x_n\}$; n is the amount of data set X, and the P-dimensional vector of fluctuation characteristics of each element table is in $\{x_{i1}, x_{i2}, \ldots, x_{im}\}$ D. The similarity characteristic variable of the time series of the quality constraint parameters of college classroom activities at the ith moment is SD, and the correlation distribution type of the corresponding time series of the quality constraint parameters of college classroom activities is y_i, with the value of 1 or −1, where 1 represents normal and −1 represents abnormal [20]. The optimal quality parameter set of college classroom activities is extracted by implementing the optimization detection approach and association rule mining, and the effectiveness evaluation and multi-dimensional parameters of college classroom activities are realized by using the optimized Apriori algorithm. Through applicability analysis and model measurement analysis, the results show that the following criteria is met:

$$p_i^* = \frac{1}{\sum_{j=i}^{N} 2m_j / \sum_{k=j+1}^{N+1} L_k p_k - \sum_{k=j}^{N} E_k} - 1, \quad i = 1, \ldots, N+1, \tag{11}$$

where $C\text{Intra}_i(n)$ is characterized to designate the optimal interval between visiting nodes for the effectiveness evaluation of classroom activities in colleges and universities and $C\text{Inter}_i(n)$ indicates the distribution time slot of quality constraint parameters of classroom activities in colleges and universities. Through applicability analysis and model measurement analysis, the scheduling and information fusion of quality constraint parameters of classroom activities in colleges and universities are comprehended, and the optimal scheduling model is achieved as follows using equations (12) and (13):

$$\operatorname{sgn}[x] = \begin{cases} 1, & x \geq 0, \\ -1, & x < 0, \end{cases} \tag{12}$$

$$w(n) = \begin{cases} \dfrac{1}{2N}, & 0 \leq n \leq N-1, \\ 0, & \text{else}, \end{cases} \tag{13}$$

where N represents the distribution node of the effectiveness evaluation data of college teaching classroom activities, thus obtaining the average membership degree of each kind of samples in the time series of the quality constraint parameters of college teaching classroom activities $E_j = \sum F_{ij} K_j (i \in K_j, \quad j = 1, 2, \ldots, N$, and K_j is the entire quantity of samples in the time series of the j^{th} class of college teaching classroom activities, and the distribution value of the test statistics of the effectiveness evaluation of college teaching classroom activities is $BL \times K_j (j = 1, 2, \ldots, N)$ [21–23]. In fact, through adopting the joint parameter analysis method, realize the scheduling and information fusion of the quality constraint parameters of college teaching activities, such as SDF, adopt the optimization detection method and association rule mining, extract the optimal quality parameter set of college teaching activities, and adopt the optimized Apriori algorithm to realize and comprehend the effectiveness evaluation and multi-dimensional parameter estimation of college teaching activities.

4. Simulation Tests and Results

On the foundation of the certain assumptions, simulation tests, and SPSS statistical exploration method, the application performance of the suggested approach for the assessment of the effectiveness of college teaching classroom activities is verified [24]. The descriptive statistical analysis and attained outcomes of the sampling of constraint parameters of college teaching classroom activities are shown in Table 1 below.

Based on the descriptive statistical investigation and the achieved outcomes, as shown in Table 1, the effectiveness evaluation and scheduling of teaching classroom activities in schools and institutions of higher education are realized. The distribution amplitude of data sampling is shown in Figure 3.

Taking the sample sequence of Figure 4 as the research object, the Apriori algorithm model for optimizing college teaching classroom activities is constructed, and the optimization evaluation function model for evaluating the effectiveness of college teaching classroom activities is constructed by the method of joint estimation of support and confidence, so as to realize the evaluation of teaching effect. The convergence curve distribution of the evaluation is shown in Figure 4.

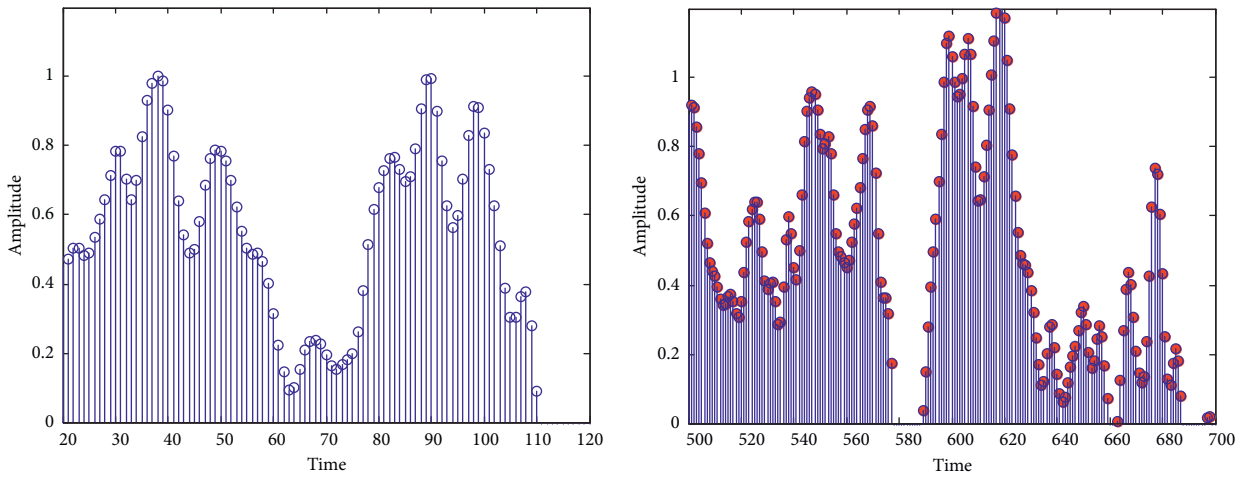

Figure 3: Sampling distribution amplitude of quality constraint parameters of college teaching classroom activities. (a) Test sequence. (b) Training sample sequence.

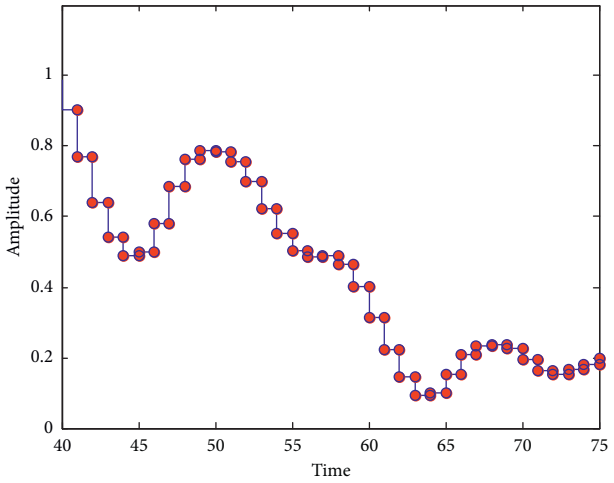

Figure 4: Convergence curve of teaching effect evaluation.

Table 2: Comparison of accuracy of quality evaluation of classroom activities in schools and institutions of higher education.

Test times	Method of this paper	[4]	[5]
10	0.931	0.623	0.613
20	0.940	0.619	0.597
30	0.929	0.617	0.589
40	0.943	0.620	0.602
50	0.925	0.626	0.625
60	0.927	0.625	0.619
70	0.919	0.627	0.628
80	0.923	0.621	0.606
90	0.928	0.623	0.613
100	0.919	0.621	0.606
110	0.916	0.624	0.616
120	0.912	0.627	0.631
130	0.917	0.620	0.599
140	0.906	0.621	0.604
150	0.938	0.626	0.625
160	0.937	0.613	0.570

According to the analysis of Figure 4, this method can effectively evaluate the quality constraint parameters of college classroom activities, improve the clustering level of data and test the fusion degree of different methods in evaluating the quality constraint parameters of college classroom activities. The assessment and comparative outcomes with the [4, 5], are given away in Table 2, which shows that the correctness of the suggested approach in evaluating the quality of college classroom activities is high.

5. Conclusions and Future Research

In this paper, the effectiveness assessment method of college teaching classroom activities grounded on the optimized Apriori algorithm is proposed. A mathematical model for assessing the usefulness of classroom activities in colleges and universities is constructed. Teaching contents, teaching attitudes, teaching methods, teaching effects, test results, and students' performance are introduced as comprehensive evaluation factors, and a decision-making model for assessing the usefulness of classroom activities in colleges and universities is established by adopting scientific, reasonable, and systematic teaching methods. Through the grey correlation analysis of classroom teaching quality, the delay characteristic analysis and the adaptive parameter adjustment method are adopted. This paper, firstly, constructs the optimal Apriori algorithm model of college teaching classroom activities. Secondly, it constructs the optimal evaluation function model of college teaching classroom activities effectiveness evaluation by the method of support-confidence joint estimation. Thirdly, it extracts the optimal quality parameter set of college teaching classroom activities by the optimization detection method and association rule mining and, finally, realizes the effectiveness evaluation and multi-dimensional parameter estimation of college teaching classroom activities by the optimized Apriori algorithm. The research demonstrates that the approach implemented in this work is trustworthy in evaluating the effectiveness of

classroom accomplishments in colleges and academies, and the directional distribution of association rules of classroom quality in colleges and academies is significant, which improves the classroom teaching level and quantitative evaluation aptitude in schools and institutions of higher education.

We believe that the suggested method has a good application value in classroom teaching assessment in schools and academies. Therefore, in the future we will continue suggesting more robust and effective algorithms so that the task can be optimized. In essence, we will consider particle swarm and other evolutionary methods because they have shown good results in similar optimization problems. Furthermore, we will increase the amount of objectives and transform the problem into many-objective optimization issues and then will suggest some swarm evolutionary methods to improve the optimization results.

Data Availability

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

Conflicts of Interest

The author declares that there are no conflicts of interest.

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