Analysis of Modular Management Effect of Practical Teaching Course in the Application-oriented Universities

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Keywords: applied colleges and universities; practical teaching; curriculum; modular management; effect analysis

Abstract: The modularization management of practical teaching courses in applied colleges and universities is the key to improve the quality of practical teaching in colleges and universities. It is different from the traditional teaching mode. In the new media era, the modularization management optimization evaluation of practical teaching courses in applied colleges and universities is carried out, the evaluation model of modularization management effect of practical teaching courses in applied colleges and universities is constructed, and a new method of modularization management of practical teaching courses in applied colleges and universities is explored. This paper puts forward an analysis model of modularization management effect of practical teaching courses in applied colleges and universities based on big data analysis. The quantitative recurrent analysis method is used to evaluate the modularization management effect of practical teaching courses in applied colleges and universities, and the statistical regression analysis model of effect evaluation is constructed. taking the hysteretic degree and rough set evaluation feature set as the constraint index, the quantitative regression analysis model of modular management evaluation of practical teaching courses in applied colleges and universities is established, and the nonlinear prediction algorithm is used to carry out the statistical analysis of the effectiveness of curriculum modularization management. The results of empirical test show that the model can effectively realize the modularization management and reliability test of practical teaching courses in applied colleges and universities. The evaluation results of practical teaching in applied colleges and universities are accurate and reliable, and the convergence of regression analysis is good, which improves the management ability of practical teaching courses in applied colleges and universities.

1. Introduction

At present, the way of cultivating talents in our country is still based on schools, and higher education is to cultivate innovative talents in line with the development trend of modern society, not just nerds who can only move hard. Practical teaching in colleges and universities plays a very important role in cultivating talents with innovative ability[1]. Practical teaching is to integrate knowledge into practice, so that students can acquire knowledge and improve their comprehensive quality in the process of hands-on operation and exploration practice. With the continuous promotion of quality education in colleges and universities, colleges and universities have gradually realized the importance of cultivating high-quality talents to adapt to the development of modern society. Colleges and universities are also actively strengthening the management of their own practical teaching and seeking practical teaching methods suitable for the development of their own specialties. It is of great significance to study the analysis model of modularization management effect of practical teaching courses in applied colleges and universities[2].

By analyzing the difference between the modularization management of practical teaching courses in applied colleges and universities and the traditional classroom, this paper understands the basic connotation of modularization management of practical teaching courses in applied colleges

  DOI: 10.25236/issec.2019.128

and universities, and probes into the construction methods and school angles of modularization management of practical teaching courses in applied colleges and universities. Practical teaching in colleges and universities should not be carried out blindly, but should be organized according to the characteristics of its own major. Practical teaching must be open and influential. We should not only do superficial articles, but also carry out them in depth, and change the teaching mode which is limited to classroom theoretical learning in the process of traditional teaching in colleges and universities. Through practical teaching, students' enthusiasm for learning can be fully aroused, so that students can gain knowledge in the process of practice and improve their practical ability and innovative ability. In this paper, the evaluation model of modularization management of practical teaching courses in applied colleges and universities is constructed, and a new method of modularization management of practical teaching courses in applied colleges and universities is explored. This paper puts forward an analysis model of modularization management effect of practical teaching courses in applied colleges and universities based on big data analysis. The quantitative recurrent analysis method is used to evaluate the modularization management effect of practical teaching courses in applied colleges and universities, and the statistical regression analysis model of effect evaluation is constructed. Taking the hysteretic degree and rough set evaluation feature set as the constraint index, the quantitative regression analysis model of modularization management evaluation of practical teaching courses in applied colleges and universities is established, and the analysis and optimization evaluation of modularization management effect of practical teaching courses in applied colleges and universities is realized.

2. Method to strengthen the modular management of the practical teaching course in colleges and universities.

The main significance of strengthening the practical teaching management of the university lies in the guarantee of the teaching quality of practice teaching. The method of strengthening the practical teaching in colleges and universities mainly includes the following aspects. Develop a detailed teaching plan for practical teaching. The practice teaching plan is the main basis for instructing the experimental teachers to successfully complete the teaching task. The students should develop different practice teaching plans according to the different characteristics of their own specialty, so that the students can make clear the purpose of the experiment in the course of the operation, and understand the main contents of the experiment. And the experiment process is ensured to be carried out smoothly. And a practical teaching management mechanism is established. The practice teaching management in colleges and universities needs to be planned, organized and orderly, so it is necessary to establish a special institution to manage the practical teaching. the main task of the institution is to manage and monitor the practical teaching, and to plan the related matters and operation specifications of various departments in the course of practical teaching, which is composed of a professional teacher and a teaching leading group, to ensure the smooth progress of practice teaching through communication with various departments[3].

Pay attention to the quality management of practice teaching. The practice of many courses in colleges and universities is strong, and only through the process of practice, the students can understand the knowledge deeply, so as to truly train the students' innovation ability and improve the students' comprehensive quality. It is necessary to pay attention to the quality management of the practice teaching, to develop the relevant management and assessment system, to ensure that the practice teaching is standardized in the course of the operation, and the experimental teachers are in charge and improve the importance of the teachers and the students[4].

The cultivation of high-quality applied talents adapted to the development of the modern social economy is the ultimate goal of the development of the educational cause of the higher education in our country. From the present point of view, the society pays more attention to the students with strong innovation ability and practical experience, which is the direction of the current university reform. The practice teaching in colleges and universities is the main way to train the students' practical ability, and the practical teaching management is the means to carry out the teaching process smoothly and efficiently. Only by strengthening the management of the practical teaching

of the university can the students' practical ability be improved.

3. Quantitative analysis model of modular management effect of practical teaching course in applied colleges and universities.

3.1. Evaluation constraint parameter analysis

In combination with the systematic feature modeling and hierarchical analysis of modular management effect of practical teaching courses in applied colleges and universities, the reliability and quantitative characteristics of modular management effects of practical teaching courses in applied colleges and universities are analyzed[5]. The fuzzy constraint index analysis method is used, the effectiveness constraint parameter analysis of modular management of practical teaching courses in applied colleges and universities is obtained as follows:

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

Wherein, $MSD_{a\to b}$ is the consistency function of distributed evaluation of teaching reform practice under the pattern of multi-tier evaluation. The distribution level $\mathrm{x}^{(0)}$ of modularization management effect of practical teaching courses in applied colleges and universities is divided into N grades. The linear programming model is adopted as $\mathrm{x}^{(1)},\mathrm{x}^{(2)},\cdots,\mathrm{x}^{(N)}$, that is $\mathbf{x}^{(0)}=\bigcup_{i=1}^{N}\mathbf{x}^{(i)}$, and the related mapping relationship of modularization management effect distribution of practical teaching courses in applied colleges and universities is obtained as:

$$p\left(R^N=r_i\right)=p\begin{pmatrix}X^N=x_i\,\big|\,|x_i|=|r_i|,angle\left(x_i\right)\\=\left(angle\left(r_i\right)-\varphi_g\right)\bmod\left(2\pi\right)\end{pmatrix} \tag{2}$$

The empirical mode decomposition method is used to decompose the modularization management effect of practical teaching courses in applied colleges and universities. Combined with the reformed state analysis method, the characteristics of modularization management effect of practical teaching courses in applied colleges and universities are analyzed[6]. The fuzzy set function is constructed to get the constraint parameter index analysis of the modularization management effect of practical teaching courses in applied colleges and universities to obtain the characteristic quantity of the modularization management effect of practical teaching courses in applied colleges and universities. The characteristic quantity satisfies the above formula of $I\left(R^N;\varphi_g\,|\,Z^N\right)=0$, substitution.

$$H\left(X^N\,|\,Z^N\right)=H\left(R^N\,|\,Z^N\right)+H\left(\varphi_g\,|\,Z^N\right) \tag{3}$$

The state parameter set of the modular management effect factor of the practical teaching course of the applied university is expressed as:

$$F=\{f_1,f_2,\cdots,f_n\} \tag{4}$$

in that quantitative evaluation of the modular management effect of the practical teaching course of the applied university, the dispatch set of the modular management effect distribution fuzzy set of the practical teaching course of the applied university in the linear programming mode is expressed as follows:

$$f(t)=\frac{1}{2\pi}\frac{d}{dt}[\arg z(t)] \tag{5}$$

The decision-making feature of the modular management effect of the practical teaching course for the construction of application-oriented universities is expressed as follows:

$$S_x = E\left[x^3(t)\right] + \sqrt{s}bu[s(t-\tau_0)] \tag{6}$$

$$K_x = E\left[x^4(t)\right] - 3E^2\left[x^2(t)\right]b \tag{7}$$

In which, $E\left[x^3(t)\right]$ is the expected value of the modular management effect of the practical teaching course of the applied university, and b represents the decision-making coefficient, and the fuzzy dispatching set of the modular management effect planning and scheduling of the practical teaching course of the applied university is expressed as follows:

$$\begin{cases} H_0 : x'(t) = w(t) \\ H_1 : \sqrt{E}s'(t) + w(t) \end{cases} \quad 0 \le t \le T \tag{8}$$

Based on the analysis, the characteristics of association rules of modularization management effect of practical teaching courses in applied colleges and universities are extracted, and the index structure of constraint parameters is constructed[7].

3.2. Analysis on the quantitative characteristics of modular management of practical teaching courses in applied colleges and universities

The multi-order eigenmode function analysis model for building the modular management effect of the practical teaching course of the applied university can be described by the following formula:

$$\begin{pmatrix} x_1(t) \\ \vdots \\ x_m(t) \end{pmatrix} = \begin{pmatrix} a_{1i} \\ \vdots \\ a_{mi} \end{pmatrix} s_1(t) \Rightarrow \frac{x_1(t)}{a_{1i}} = \cdots = \frac{x_m(t)}{a_{mi}} = s_i(t) \tag{9}$$

According to the association rule mining method, the statistical regression analysis model of the modular management effect of the practical teaching course of the applied university is expressed as follows:

$$\hat{w}_j^k = \begin{cases} sign(w_j^k)\left(|w_j^k| - \beta \cdot T_j\right), \text{if } |w_j^k| \ge T_j \\ 0, \qquad \text{else} \end{cases} \quad j=1,2,...,J+1 \tag{10}$$

The multi-order eigenmode function analysis model for building the modular management effect of the practical teaching course of the applied university is represented as a two-dimensional planning problem, which is described as:

$$T_j = \begin{cases} \sigma\sqrt{2\ln(N)}\left(1 - \frac{J}{2} \times \frac{E_j}{\sum_{j=1}^{J+1} E_j}\right), \quad j=1,2,...,J \\ \sigma\sqrt{2\ln(N)} \times \frac{E_j}{\sum_{j=1}^{J+1} E_j}, \; j = J+1 \end{cases} \tag{11}$$

In which, N represents the exponential distribution length, and J is the order of hierarchical analysis of modular management effect of practical teaching courses in applied colleges and universities[8].

4. Evaluation and optimization of modular management effect of practical teaching course in applied colleges and universities

4.1. Quantitative recurrent analysis

The reliability evaluation of modularization management of practical teaching courses in applied colleges and universities is carried out by using quantitative recurrent analysis method, and the game correlation analysis model of reliability evaluation is constructed[9]. The set of quantitative

recurrent analysis association rules for reliability evaluation of modular management of practical teaching courses in applied colleges and universities is expressed as follows:

$$J_m(U,V)=\sum_{k=1}^{n}\sum_{i=1}^{c}\mu_{ik}{}^{m}(d_{ik})^2 \tag{12}$$

Wherein, m is the quantitative set of similarity evaluation index, $(d_{ik})^2$ is the feature set of association rules optimized by teaching strategy reform, combined with semantic ontology mapping method, the reliability quantitative index of modular management of practical teaching curriculum in applied colleges and universities is analyzed and reconstructed[10], and the information transmission model of modularization management and effectiveness evaluation of practical teaching curriculum in applied colleges and universities is obtained by using big data fusion scheduling method:

$$\max\ T$$

$$s.t.\sum_{(i,j)\in E}\hat{g}_{ij}^{c}-\sum_{j\in V}\sum_{(j,i)\in E}\hat{g}_{ji}^{c}=T\sigma_i^c,\ \forall i,c \tag{13}$$

$$\left(\sum_{c\in\mathcal{C}}\sum_{(i,j)\in E}e_i^t\hat{g}_{ij}^{c}+\sum_{c\in\mathcal{C}}\sum_{j\in V}\sum_{(j,i)\in E}e_i^r\hat{g}_{ji}^{c}\right)T\le E_i,\ \forall i \tag{14}$$

According to the above analysis, the decision tree model and quantitative recurrent analysis model are used to evaluate the reliability of modular management of practical teaching courses in applied colleges and universities. the decision tree model is shown in Fig. 1.

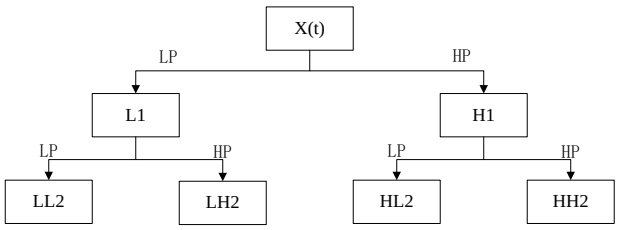

Fig. 1 Decision tree model of modular management effect evaluation of practical teaching courses in applied colleges.

By using the fuzzy rough set scheduling method, the characteristic distribution set of the quantitative evaluation of the reliability of modular management of practical teaching courses in applied colleges and universities is obtained as follows:

$$HV=volume\left(\bigcup_{i=1}^{|Q|}v_i\right) \tag{15}$$

Wherein, Q is the characteristic distribution set of fuzzy correlation, and the game relationship model of reliability evaluation for modular management of practical teaching courses in applied colleges and universities is as follows:

$$f_{Env}(s)=\begin{cases}\sqrt{\dfrac{2}{\pi}}e^{-s^2/2}, s\ge 0\\ 0, y<0\end{cases} \tag{16}$$

$$f_{power}(p)=\begin{cases}\dfrac{1}{\sqrt{2\pi}}p^{-1/2}e^{-p/2}, p\ge 0\\ 0, p<0\end{cases} \tag{17}$$

Wherein, S represents the statistical average sequence, p is the decision functional of modularization management reliability evaluation of practical teaching courses in applied colleges and universities. According to the above analysis, the quantitative recurrent analysis of modular management reliability evaluation of practical teaching courses in applied colleges and universities

is carried out[11].

4.2. Validity test

Taking hysteretic degree and rough set evaluation feature set as constraint indexes, the quantitative regression analysis model of modular management evaluation of practical teaching courses in applied colleges and universities is established[12]. The fuzzy related features of modularization management evaluation of practical teaching courses in applied colleges and universities are obtained by using fuzzy fusion cluster analysis method:

$$C_{T'}(f)=\sum_{k=-K}^{K} c_k e^{-j2\pi fkT'} \tag{18}$$

In which, c_k is a sample fuzzy dispatching set, $T'=MT/N$ is the modular management evaluation of the practical teaching course of the applied university, and the random sampling method is adopted, the sampling frequency, $f=N/MT$ is taken as the sampling frequency, and the statistical characteristic quantity of the relevance statistical characteristic of the modular management evaluation of the practical teaching course of the applied university is distributed as follows:

$$\overline{C}_{ij}=\sum_{\tau}(x_{i\tau}-\overline{x}_{i\tau})(x_{j\tau}-\overline{x}_{j\tau}) \tag{19}$$

$$\widetilde{C}_{ij}=\sum_{\tau}(x_{i\tau}-\widetilde{x}_{i\tau})(x_{j\tau}-\widetilde{x}_{j\tau}) \tag{20}$$

Statistical score of effectiveness of implementation strategy with nonlinear prediction algorithm[13]. The prediction results of modular management and implementation strategy evaluation of practical teaching courses in applied colleges and universities are expressed as follows:

$$\begin{cases} x_{i,t+1}=(x_{i,t}+x'_{i,t+1})/2 \\ y_{i,t+1}=(y_{i,t}+y'_{i,t+1})/2 \end{cases} \tag{21}$$

By adopting the self-adaptive grouping test method, the modularization management reliability evaluation of the practical teaching course of the applied university is realized, and the statistical decision is made according to the evaluation result[14,15].

5. Empirical analysis and test.

In order to quantify the application performance of the improvement method in the realization of the modular management of the practical teaching course of the applied university and the effectiveness of the implementation strategy, the empirical analysis is carried out, and the experimental test is carried out by using the SPSS 19.0 statistical analysis software and the Matlab, and the descriptive statistical analysis results are shown in Table 1.

Table 1 Results of descriptive statistical analysis

Database set	Statistics group 1		Statistics group 2	
	Test set	Training set	测试集	训练集
D1	2643	4533	1564	2535
D2	1453	4644	1577	1565
D3	3432	4443	6665	4544
D4	4345	5766	3467	3565
D5	5543	6565	6534	3533
D6	6456	3554	8467	2355

According to the results of the statistical analysis in Table 1, a quantitative regression analysis

model for the modular management of the practical teaching course of the applied university and the evaluation of the effectiveness of the implementation strategy is established, and the result of the quantitative regression analysis is shown in Fig.2.

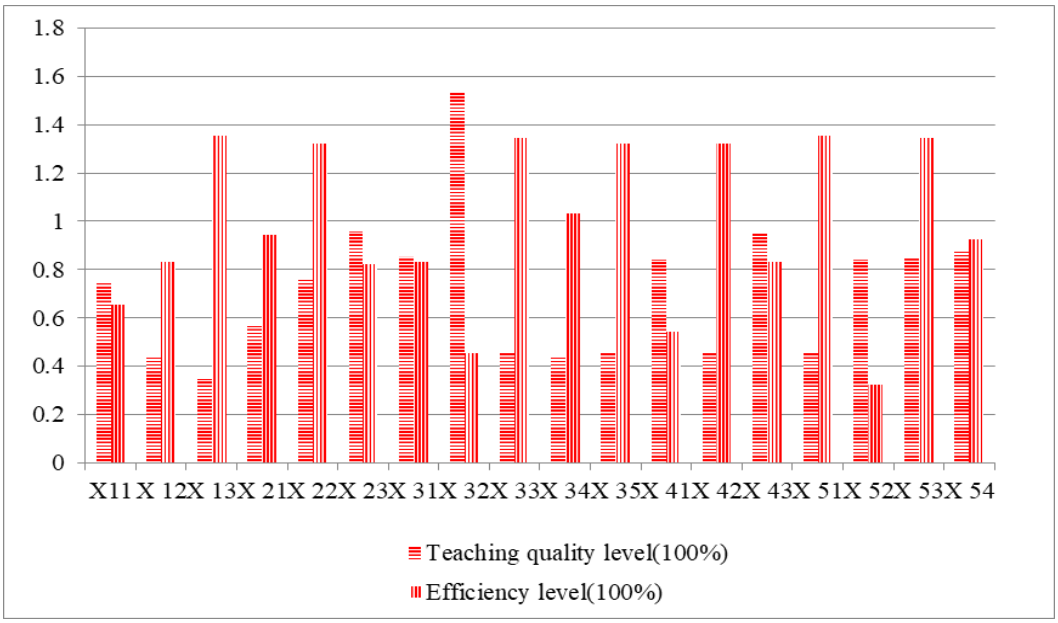

Fig.2 Results of quantitative regression analysis

The analysis of Fig. 2 shows that this method can effectively realize the reliability evaluation of modularization management and implementation strategy of practical teaching courses in applied colleges and universities, and the convergence curve is tested. The results are shown in Fig. 3. Figure 3 shows that the model has good convergence and high evaluation reliability.

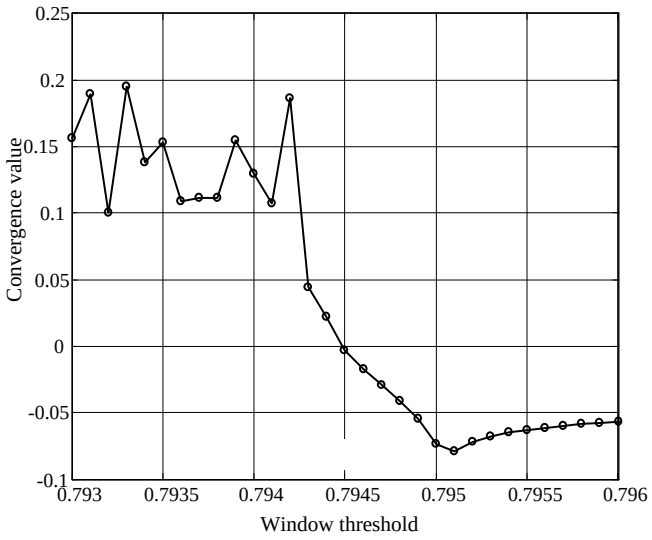

Fig. 3 Convergence test

6. Conclusions

Practical teaching is an important teaching link to cultivate practical talents and improve students' practical ability in colleges and universities in China, and it is an indispensable part of the teaching plan of colleges and universities. It is an important direction of the development of higher education to strengthen practical teaching, improve the quality of practical teaching and cultivate students' practical ability and innovative consciousness. In college education, practical teaching and theoretical teaching are the unified system of mutual support for the whole teaching, which is indispensable. From the fundamental purpose of talent training, practical teaching is more important

and requires more emphasis on practical teaching. In this paper, an analysis model of modularization management effect of practical teaching courses in applied colleges and universities based on big data analysis is put forward. The quantitative recurrent analysis method is used to evaluate the modularization management effect of practical teaching courses in applied colleges and universities, and the statistical regression analysis model of effect evaluation is constructed to realize the quantitative evaluation of modularization management effect of practical teaching courses in colleges and universities, and the evaluation results are accurate and reliable.

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