Comprehensive Test and Evaluation Path of College Teachers' Professional Development Based on a Cloud Education Big Data Platform

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Abstract—Teachers serve as carriers who shoulder the important task of improving the quality of education, and their professional level affects the quality of vocational and technical personnel training. At present, the professional growth of teachers in vocational colleges has attracted more and more attention from the society. This article studies the comprehensive test and evaluation path of college teachers' professional development based on cloud education big data platform. This article constructs a "supply-demand relationship" model between cloud education big data platform and college teachers' professional development and expounds the comprehensive test and evaluation strategy of college teachers' professional development based on cloud education big data platform. This article constructs a comprehensive measure index system of influencing factors of college teachers' professional development and weights the evaluation indexes based on AHM attribute hierarchy model. By optimizing the super-efficiency SBM model, it proposes a comprehensive evaluation method considering the temporal and spatial features of college teachers' professional development level, which is suitable for different professional teachers' professional development features. The experimental results verify the effectiveness of the evaluation index system and evaluation model.

Keywords—cloud education platform, big data analysis, college teachers, evaluation of teachers' professional development

1 Introduction

Vocational education is an important part of the national education system and human resources development, and an important way to train diversified vocational and technical talents and promote employment and entrepreneurship [1–6]. Improving the quality of education is the key to training vocational and technical talents. Teachers, as carriers shouldering the important task of improving the quality of education, are irreplaceable and dynamic core factors in the process of realizing educational modernization [7–12]. Teachers' professional level directly affects the quality of educational activities and further affects the quality of vocational and technical personnel training,

so the professional growth of vocational college teachers has attracted more and more attention from the society [13, 14]. The key to promote the professional growth of teachers in vocational colleges lies in exploring the actual situation of teachers' professional development, giving accurate evaluation, and implementing scientific, reasonable and effective measures to intervene from the reality [15, 16]. Therefore, the research on the comprehensive test and evaluation path of teachers' professional development has become the top priority.

Digital transformation has an impact on teaching methods and contents. For the purpose of teacher professional development, Guggemos and Seufert [17] proposes a conceptual framework for predicting the use of technology as teaching means and content. It is informed by the TPACK framework and the "Willingness, Skills, Tools" model. A sample of 212 in-service teachers from German-speaking business schools in Switzerland are used for structural equation modeling, which provided support for the reliability of measurement tools and conceptual framework. Liu et al. [18] discusses the influence of Chinese college teachers' use of digital learning platform on their professional development through a successful information system model. The research object is full-time teachers who use digital learning platform in Chinese universities. A total of 432 college teachers are sampled and 379 questionnaires are collected. The results show that the user satisfaction of Chinese college faculty on system quality, information quality and willingness to use digital learning platform has a significant impact, and the willingness to use digital learning and user satisfaction have a significant impact on the professional development of college teachers. Wu et al. [19] proposes that with the help of a series of professional courses to support training, experiment, practical operation and design, and through the synchronous interaction between classroom theory and engineering practice application, it's possible to improve the practical teaching ability of young teachers from engineering task design and engineering practice operation to engineering problem. It provides teacher quality assurance for the delivery of high-quality engineering and scientific talents in high-end manufacturing fields. Nurhasanah et al. [20] is a report on the community service plan for mathematics teachers. The plan aims to develop the skills of math teachers to teach meaningfully through active learning using Google Classroom. The plan is carried out in Karangayar area of Surakata, Indonesia.

The impact of digital learning platform on college teachers' professional development has been discussed in previous studies. However, they have not tested and evaluated the effect of college teachers' professional development by using digital learning platform. Therefore, this article studies the comprehensive test and evaluation path of college teachers' professional development based on cloud education big data platform. In the second chapter, this article constructs a "supply-demand relationship" model between cloud education big data platform and college teachers' professional development, and expounds the comprehensive test and evaluation strategy of college teachers' professional development based on cloud education big data platform. In the third chapter, this article constructs a comprehensive measure index system of influencing factors of college teachers' professional development, and weights 14 evaluation indexes and 4 temporal and spatial feature refinement indexes based on AHM attribute hierarchy model. In the fourth chapter, by optimizing the super-efficiency SBM model,

it proposes a comprehensive evaluation method considering the temporal and spatial features of college teachers' professional development level, which is suitable for different professional teachers' professional development features. The experimental results verify the effectiveness of the evaluation index system and evaluation model, and the ANOVA test of learning cycle and professional type in the evaluation of college teachers' professional development is carried out.

2 Evaluation strategy of college teachers' professional development

The era of big data has brought great influence to the field of higher education. In order to achieve the goal of improving the professional development of college teachers, it is necessary to improve the application level of emerging fields such as big data technology and information platform. Cloud education includes education and training management information system, distance education and training system and training institution website in cloud training, and is the development of cloud technology platform and its application in the field of education and training. On this platform, education departments, schools, teachers, students, parents and other educators can share educational resources and educational achievements to complete the interaction between educators and educated people.

Cloud education big data platform is a platform that includes massive data, and different types of learning resources will be updated in real time. Vocational colleges apply big data technology to teachers' professional development, which makes teachers better adapt to the time-varying environmental features of vocational and technical talents and students' personalized and diversified learning needs. If college teachers want to improve their professional development ability, they must integrate social development, industry development, learning resources and training suitable for themselves into their future development, drive the formulation and implementation of teaching decisions with data, and provide students with vocational and technical education that better matches the needs of social posts.

Under the service environment of cloud education big data platform, the subjects of professional development evaluation of college teachers will be more diversified. The access of cloud education big data platform makes teachers' professional development needs more refined. It is necessary to abandon the original paradigm of professional development based on personal knowledge and experience, and learn and master more learning resources recommended by the platform. The "supply-demand relationship" model between cloud education big data platform and college teachers' professional development is given in Figure 1.

The comprehensive test and evaluation path of college teachers' professional development based on cloud education big data platform is shown in Figure 2. The selection of comprehensive measure indexes is the first step in the evaluation of college teachers' professional development, followed by expert consultation, scoring and data collection of teachers' operation behavior in cloud education big data platform, combined with the analysis of temporal and spatial features of college teachers' professional development level, the construction of judgment matrix and the weighting of indexes. By testing

the indexes of college teachers' professional development at all levels based on cloud education big data platform, it's possible to test the authority and applicability of the indexes. Finally, according to the evaluation results of college teachers' professional development, it's essential to find out the shortcomings and promotion paths of college teachers' professional development.

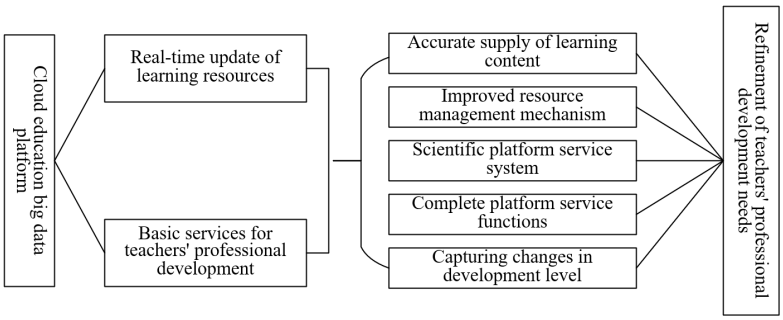

Fig. 1. "Supply-demand relationship" model of cloud education big data platform and professional development of college teachers

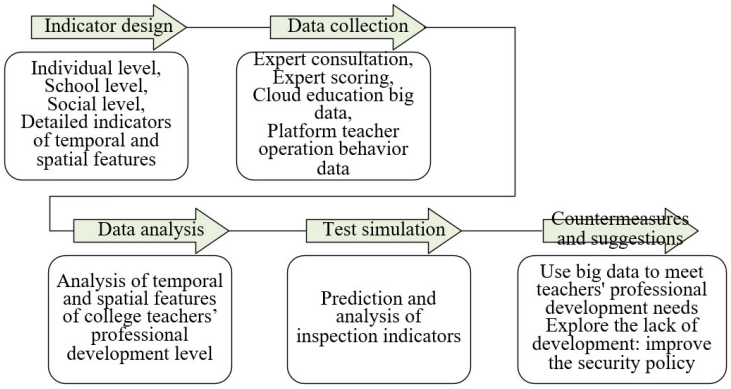

Fig. 2. Comprehensive test and evaluation path of college teachers' professional development based on cloud education big data platform

3 Index selection criteria and weighting

According to the above, this article determines the comprehensive measure index of the influencing factors of college teachers' professional development as three aspects: individual level, school level and social level. Individual level includes professional

development consciousness, professional development enthusiasm, professional goal orientation, self-awareness and professional values. The school level includes professional development training system, professional development requirements, professional and technical post promotion system and professional development incentive policy. The social level includes vocational education guarantee system and measures, investment in the construction of high-quality teachers, orientation of vocational education types, conditions for running vocational schools, and promotion of integration of production and education. There are 14 measure indexes in three aspects.

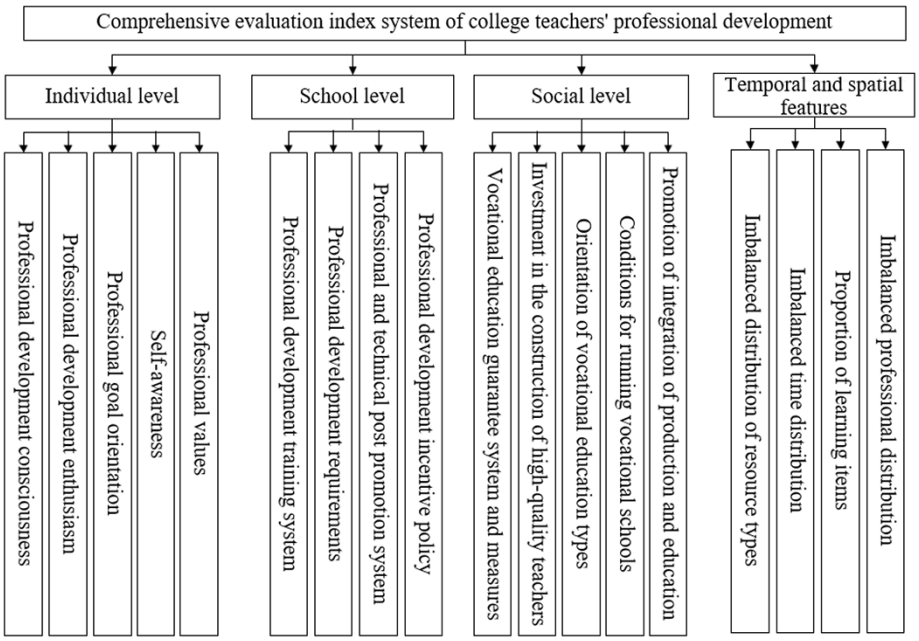

Fig. 3. Evaluation index system

The promotion of college teachers' professional development level is a dynamic process. In addition to the above indexes, in order to track the real-time changes of college teachers' professional development level, this article introduces the temporal and spatial features of college teachers' professional development level, and realizes the refinement of comprehensive test indexes of college teachers' professional development. Figure 3 shows the evaluation index system.

On the cloud education big data platform, the same type of learning resources may be selected by teachers with the same development direction, and the distribution of teachers in different types of learning resources is imbalanced. In order to quantify the imbalance in the number of teachers, the variable of imbalance shown in Formula 1 is introduced, assuming that the number of teachers participating in learning at the i-th period is represented by g_i, and the total number at that moment is represented by M.

The maximum number of teachers at this time on this type of learning resource is represented by g_{max}. The following formula gives the calculation method 1:

$$\sigma_i = \frac{g_{\max} * \sum_{i=1}^{M} g_i}{M} \tag{1}$$

Time imbalance is mainly designed to measure the imbalance of the distribution of teachers in different time periods during the operation time of cloud education big data platform. Cloud education big data platform will form a peak of service times based on teachers' working hours in the process of increasing the number of teachers during working hours. Assuming that the number of teachers at the *i*-th period is represented by g_i, and the total number of unit periods in the full-time operation period of the cloud education big data platform is represented by F, this article uses the time imbalance index shown in the following formula to characterize the imbalanced distribution of this service number in the time dimension:

$$E_i = \frac{g_i * F}{\sum_{t=1}^{F} g_i} \tag{2}$$

From the above formula, it can be seen that the closer E_i is to 0, the more uniform the distribution of teachers' professional development in time dimension.

The proportion of learning items of college teachers' professional development represents the comprehensive degree of college teachers' professional development, and is an important index to evaluate whether college teachers' professional development meets the needs of all items. Assuming that the fixed number of learning items is expressed by ω, the following formula gives the formula for calculating the proportion:

$$O_k = \frac{\sum_{i=1}^{M} g_i}{\omega * M} * 100\% \tag{3}$$

In the real operation scenario of cloud education big data platform, the same type of learning resources may be selected by teachers of different majors at the same time, and the number of teachers of different majors who choose the learning resources is usually quite different. Assuming that the professional imbalance index is represented by C_i and the maximum number of teachers in a certain major selected by teachers at this time of the same type of learning resources is represented by g'_{max}, this article quantifies the degree of uniform distribution of teachers in different majors through the calculation of the following formula:

$$C_i = \frac{\max\left(g_{\max}, g'_{\max}\right)}{\left(g_{\max} + g'_{\max}\right)/2} \tag{4}$$

From the above formula, it can be seen that the greater the C_i value is, the greater the difference between the learning resources selected by teachers of different majors at the same time is.

In order to facilitate the comprehensive evaluation and comparison of college teachers' professional development, before the comprehensive evaluation, it is necessary to normalize and converge 14 measure indexes and 4 temporal and spatial feature refinement indexes. Assuming that the normalized result of the evaluation index is represented by A_i, the initial calculation result of the evaluation index is represented by a, and the maximum and minimum values of the series in which the index is located are represented by a_{max} and a_{min} respectively, the normalization method is given by the following formula:

$$A_i = \frac{a_i - a_{ave}}{a_{\max} - a_{\min}} \tag{5}$$

The index A_j after converging can be calculated by the following formula:

$$A_j = 1 - A_i \tag{6}$$

In order to highlight the importance of some indexes, this article weights 14 measure indexes and 4 temporal and spatial feature refinement indexes based on AHM attribute hierarchy model.

Firstly, the relative attribute judgment matrix of each comprehensive measure index of influencing factors of college teachers' professional development is constructed, and m comprehensive measure indexes v_1, v_2 … v_m are set to compare the relative importance λ_{ij} and λ_{ji} of v_i and $v_j(i \neq j)$ to the criterion of college teachers' professional development D. Because the comparison between the comprehensive measure index and itself is meaningless, it needs to meet the following formula:

$$\lambda_{ij} = 0, 1 \le i \le m \tag{7}$$

Set

$$h(a) = \begin{cases} 1, a > 0.5 \\ 0, a \le 0.5 \end{cases} \tag{8}$$

$$W_i = \{ j : h(\lambda) = 1, 1 \le j \le m \} \tag{9}$$

The constructed relative attribute judgment matrix needs to meet the consistency requirement, That's, for any i, when W_i is not empty, it needs to meet the following formula:

$$h(\lambda_{ij}) - h\left[\sum_{j \in I_i} h(\lambda_{jl}) \right] \ge 0, 1 \le l \le m_0 \tag{10}$$

The following formula gives the formula for calculating the weight $\theta_d(i)$ of the i-th element:

$$\theta_d(i) = \frac{2}{m(m-1)} \sum_{j=1}^{m} \lambda_{ij} \tag{11}$$

The relative attribute of the comprehensive measure index under the criterion D of college teachers' professional development is represented by the attribute judgment matrix $(\lambda_{ij})_{m*m}$.

4 Construction of comprehensive evaluation model

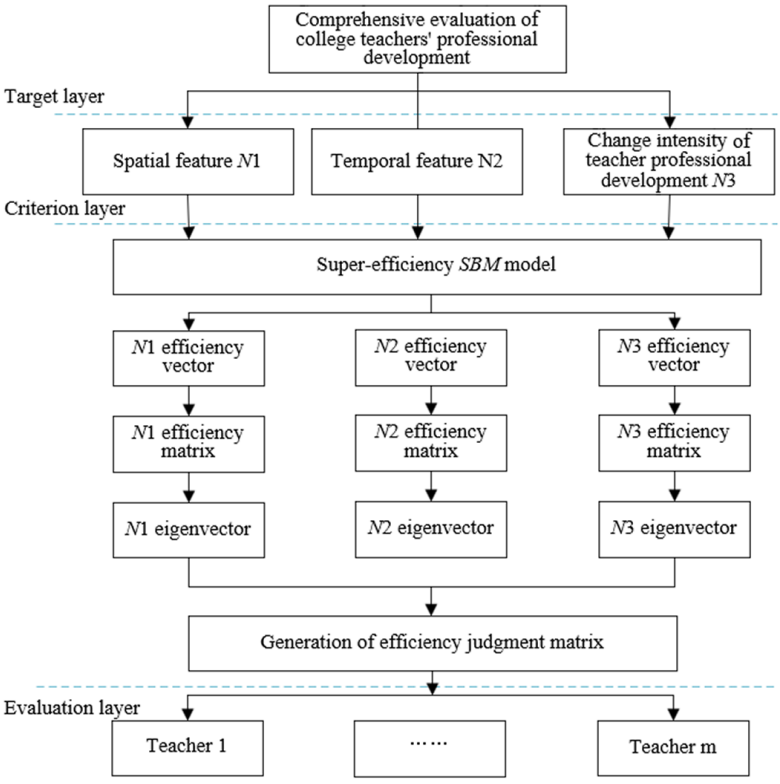

Fig. 4. Construction steps of comprehensive evaluation model for college teachers' professional development

At present, the popular evaluation of college teachers' professional development only focuses on the advantages and disadvantages of one aspect of comprehensive measure index. Moreover, it ignores the coordination of the influence of real-time changes of individual level, school level and social level on college teachers' professional development, and the performance of different professional development evaluation indexes of the same teacher is inconsistent or even contradictory. Therefore, this article introduces SBM model considering input and output relaxation. That's, based on the comprehensive evaluation index system of college teachers' professional development, the super-efficiency SBM model is optimized, and a comprehensive evaluation method considering the temporal and spatial features of college teachers' professional development level and suitable for different professional teachers' professional development features is put forward.

The constructed model uses SBM model to evaluate the efficiency of teachers' participation features under the overall operation state of cloud education big data platform. Based on the results of efficiency evaluation, different criteria are constructed to further refine the comprehensive test indexes of college teachers' professional development and weight the key indexes related to teachers' development level, so as to generate the optimal solution to college teachers' professional development under multiple constraints.

This article selects super-efficiency SBM non-angle model, which greatly weakens the deficiency that the traditional evaluation model relies too much on the subjectivity of evaluators, so that the comprehensive evaluation of college teachers' professional development can not only reflect the importance of four spatial and temporal feature refinement indexes relative to 14 measure indexes, but also avoid the overlapping degree of index system caused by simply increasing the number of indexes in pursuit of the comprehensiveness of the evaluation direction of college teachers' professional development, and objectively measure the differences of teachers' professional development in different majors.

Figure 4 shows the steps of building a comprehensive evaluation model for college teachers' professional development. The construction ideas of the established comprehensive evaluation model are described in detail as follows:

STEP1: The comprehensive evaluation index features are divided into three aspects: spatial feature $N1$, temporal feature $N2$ and change intensity of teachers' professional development $N3$, which are used as the judgment criterion N of college teachers' professional development. The weight of the i-th N_i index in the criterion layer N is expressed by μ_i, and the final weight vector (μ_1,μ_2,μ_3) is obtained.

STEP2: Using super-efficiency *SBM* model, the efficiency value τ_{ij} of each decision-making unit based on each comprehensive evaluation index is obtained from spatial feature $N1$, temporal feature $N2$ and change intensity of teacher professional development $N3$. τ_{ij} is the efficiency value of the j-th decision unit based on N_i in the criterion layer.

Assuming that the scale efficiency of input-oriented SBM model is expressed by σ^*_{im}, compared with CCR model, which decomposes technical efficiency into the product of

pure technical efficiency and scale efficiency, the scale efficiency *RT* of SBM model considering relaxation measure has the following relationship with the scale efficiency of CCR model and BCC model:

$$\omega_{CCR}^{*} = \omega_{BCC}^{*} * RT \tag{12}$$

$$\sigma_{im}^{*} \le \omega_{DDS}^{*} \tag{13}$$

Different from CCR model and BCC model, SBM model is not a radial measurement method, but a non-radial measurement method. The following formula gives the definition of mixing efficiency:

$$\Gamma = \frac{\sigma_{in}^{*}}{\omega_{CCR}^{*}} \tag{14}$$

If pure technical efficiency is expressed by Ω, the efficiency decomposition formula of the constructed super-efficiency SBM model can be obtained:

$$\sigma_{im}^{*} = [\Gamma] * [\Omega] * [RT] \tag{15}$$

STEP3: The efficiency of each decision-making unit solved by the model in STEP2 is compared in pairs, and after the ratio is normalized, the judgment matrix of the *i*-th index N_i of each decision-making unit under the criterion layer *N* can be generated:

$$\begin{pmatrix} 1 & \cdots & \tau_{i1} / \tau_{im} \\ \vdots & \ddots & \vdots \\ \tau_{im} / \tau_{i1} & \cdots & 1 \end{pmatrix} \tag{16}$$

Then the temporal feature *N*1, the spatial feature *N*2, the change intensity of teachers' professional development *N*3, the weight coefficients $\mu_{i1},\mu_{i2},\mu_{im}$ of each index, and the weight coefficient μ_{ij} of the *j*-th index relative to the *i*-th index N_i in the criterion layer *N* are calculated.

STEP4: Based on the weight vectors (μ_1,μ_2,μ_3) and $(\mu_{i1},\mu_{i2},\mu_{im})$ obtained from STEP1 and STEP3, the comprehensive weight efficiency vector $(\mu_{i1},\mu_{i2},\mu_{im})^T * (\mu_1,\mu_2,\mu_3)^T$ of each decision-making unit can be obtained. By sorting the comprehensive weight efficiency of each decision-making unit, we can get the comprehensive score of college teachers' professional development evaluation, and then judge the advantages and disadvantages of college teachers' professional development.

5 Experimental results and analysis

Firstly, taking interior design teachers as an example, this article makes a descriptive analysis of 14 measure indexes in the evaluation of college teachers' professional development before accessing the cloud education big data platform from three aspects, i.e., individual level, school level and social level, and finds that the minimum value is 1.5, the maximum value is 4.5, and the average value is 3.146. The higher the score of the index is, the higher the professional development degree of college teachers is. From Table 1, we can see that college teachers' professional development level needs to be further improved, and the standard deviation is 0.995, which shows that there is a small difference in the professional development level of teachers participating in the experiment.

Table 1. Descriptive analysis of college teachers' professional development evaluation

Index	Average	Standard Deviation	Minimum	Maximum
Individual level	3.295	1.104	1.5	4.5
School level	2.514	1.192	1.5	4.5
Social level	3.628	1.174	1.5	4.5

Table 2. Descriptive analysis of temporal and spatial features of college teachers' professional development

Index	Average	Standard Deviation	Minimum	Maximum
Imbalanced distribution of resource types	2.417	1.105	0.7	3.9
Imbalanced time distribution	2.958	1.197	0.7	3.9
Proportion of learning items	2.061	1.142	0.7	3.9
Imbalanced professional distribution	2.541	1.128	0.7	3.9

Table 2 makes a descriptive analysis of the temporal and spatial features of college teachers' professional development from four aspects: imbalanced distribution of resource types, imbalanced time distribution, proportion of learning items and imbalanced professional distribution. It is found that the minimum value is 0.7, the maximum value is 3.9, and the average value is 2.49. The lower the score of three imbalanced indexes in the four temporal and spatial feature refinement indexes is, the higher the professional development degree of college teachers is, and the lower the proportion of learning items is, the higher the professional development degree of college teachers is. It can be seen that the average value of the temporal and spatial features refinement index of college teachers' professional development is slightly lower than other evaluation indexes, which represents that the professional development of college teachers is gradually facing a better direction. The standard deviation is 1.159, which shows that there is a small difference in the temporal and spatial features of teachers' professional development level.

Tables 3–5 give the regression analysis results of individual factors, school factors and social factors and the temporal and spatial features of college teachers' professional development. As can be seen from Table 3, the explanations of professional development awareness, professional development enthusiasm, professional goal orientation, self-awareness and professional values on the changes of college teachers' professional development level in sample sets 1 and 2 are 21.4% and 32.5%, respectively. Independent variables explain that dependent variables are significant level, standardized regression coefficients are greater than 0, indicating the positive impact of professional development awareness, professional development enthusiasm, professional goal orientation, self-awareness, and professional values on college teachers' professional development level.

Table 3. Regression analysis between personal factors and temporal and spatial features of college teachers' professional development

Variable	Sample Set 1	Sample Set 2
Professional development awareness	0.225*	0.417**
Professional development enthusiasm	0.524**	0.362*
Professional goal orientation	0.246*	0.274*
Self-awareness	0.698***	0.559**
Professional values	0.326*	0.269*
R^2	0.263	0.341
Adjusted R^2	0.214	0.325
F value	215.174***	162.594**

Note: ***, ** and * respectively indicate that they passed the significance test at the level of 1%, 5% and 10%.

Table 4. Regression analysis of school factors and temporal and spatial features of college teachers' professional development

Variable	Sample Set 1	Sample Set 2
Professional development training system	0.748**	0.457*
Professional development requirements	0.556**	0.326**
Professional and technical post promotion system	0.298*	0.346*
Professional development incentive policy	0.632***	0.227*
R^2	0.314	0.314
Adjusted R^2	0.392	0.358
F value	251.473***	132.47**

Note: ***, ** and * respectively indicate that they passed the significance test at the level of 1%, 5% and 10%.

As can be seen from Table 4, the explanations of professional development training system, professional development requirements, professional and technical post promotion system and professional development incentive policy on the changes in college teachers' professional development level in sample sets 1 and 2 are 39.2% and 35.8%, respectively. Independent variables explain that dependent variables are significant. The standardized regression coefficients are all greater than 0, which indicates that the

professional development training system, professional development requirements, professional and technical post promotion system and professional development incentive policies have a positive impact on the change in college teachers' professional development level, and have a great promotion effect on the promotion of college teachers' professional development ability. Similarly, as can be seen from Table 5, in sample sets 1 and 2, the explanations of vocational education guarantee system and measures, investment in the construction of high-quality teachers, orientation of vocational education types, conditions for running vocational schools, and promotion of integration of production and education on the changes of college teachers' professional development level are 36.7% and 31.7%, respectively. The independent variables explain that the dependent variables all reach a significant level, and the standardized regression coefficients are all greater than 0, which indicates that the vocational education guarantee system and measures, the investment in the construction of high-quality teachers, the orientation of vocational education types, the conditions for running vocational schools, and the promotion of the integration of production and education also greatly promote college teachers' professional development level.

Table 5. Regression analysis of social factors and temporal and spatial features of college teachers' professional development

Variable	Sample Set 1	Sample Set 2
Vocational education guarantee system and measures	0.767**	0.457*
Investment in the construction of high-quality teachers	0.467*	0.326**
Orientation of vocational education types	0.331**	0.253*
Conditions for running vocational schools	0.397*	0.567**
Promotion of the integration of production and education	0.273*	0.286*
R^2	0.365	0.329
Adjusted R^2	0.367	0.317
F value	264.073***	115.67**

Note: ***, ** and * respectively indicate that they passed the significance test at the level of 1%, 5% and 10%.

Table 6. ANOVA test of learning cycle in the evaluation of college teachers' professional development

Learning Cycle	*CCR*		*BCC*		Improved *SBM*	
	Average	Standard Deviation	Average	Standard Deviation	Average	Standard Deviation
Less than 5 weeks	2.147	0.915	2.417	0.984	2.361	0.625
6–10 weeks	3.629	1.625	3.014	1.632	3.274	0.584
11–15 weeks	3.205	0.748	3.958	0.957	2.014	0.306
More than 15 weeks	3.574	0.839	3.044	0.825	3.692	0.458
F	7.415*		12.041***		15.284**	
P	3		5		2	
LSD	2<8<2<6		5<1<6<8		2<5<1<6	

Note: ***, ** and * respectively indicate that they passed the significance test at the level of 1%, 5% and 10%.

According to the evaluation results of different models on the evaluation of college teachers' professional development, this article carries out ANOVA test of learning cycle and professional type in the evaluation of college teachers' professional development, and the verification results are given in Tables 6 and 7. It can be seen from the tables that the SBM model constructed in this article can obtain lower errors than CCR model and BCC model for teachers with different learning cycles or different professional types. At the same time, it can be found that the professional development level *P* of college teachers in different learning cycles using cloud education big data platform is significant at 0.001 level, and that of college teachers in different majors is significant at 0.001 level. According to the least significant difference method, the average value of professional development level of college teachers whose learning cycle is less than 5 weeks is the smallest, which shows that college teachers whose learning cycle is more than 15 weeks have the highest professional development level. College teachers' professional development level in science and engineering is the highest, while that of college teachers in art is the lowest.

Table 7. ANOVA test of evaluation of college teachers' professional development

Major	*CCR*		*BCC*		Improved *SBM*	
	Average	Standard Deviation	Average	Standard Deviation	Average	Standard Deviation
Science and engineering	2.174	1.258	3.417	1.205	2.417	0.204
Humanities	3.062	0.914	3.265	0.958	2.629	0.306
Art	3.958	0.836	2.314	0.847	2.513	0.925
F	8.529**		8.256**		13.528*	
P	0.021		0.002		0.004	
LSD	2<5<1		5<2<8		3<1<6	

Note: ** and * respectively indicate that they passed the significance test at the level of 5% and 10%.

6 Conclusion

Taking interior design teachers as an example, this article studies the comprehensive test and evaluation path of college teachers' professional development based on cloud education big data platform and constructs a "supply-demand relationship" model between cloud education big data platform and college teachers' professional development, and expounds the comprehensive test and evaluation strategy of college teachers' professional development based on cloud education big data platform. This article constructs a comprehensive measure index system of influencing factors of college teachers' professional development, and weights the evaluation indexes based on AHM attribute hierarchy model. By optimizing the super-efficiency SBM model, it proposes a comprehensive evaluation method considering the temporal and spatial features of college teachers' professional development level, which is suitable for different professional teachers' professional development features. Combined with experiments, this article first makes a descriptive analysis of the evaluation of college teachers' professional development before accessing the cloud education big data platform, and gives

the analysis results. Furthermore, the regression analysis of individual factors, school factors and social factors with the temporal and spatial features of college teachers' professional development is given, and the corresponding analysis results are obtained. Finally, the ANOVA test of learning cycle and professional type in the evaluation of college teachers' professional development is carried out, with the verification results obtained.

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