Retraction

Retraction: Research on Teaching Ability Evaluation Model of University Teachers Based on Computer Big Data Theory (J. Phys.: Conf. Ser. 1992 032003)

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The authors of the article have been given opportunity to present evidence that they were the original and genuine creators of the work, however at the time of publication of this notice, IOP Publishing has not received any response. IOP Publishing has analysed the article and agrees there are enough indicators to cause serious doubts over the legitimacy of the work and agree this article should be retracted. The authors are encouraged to contact IOP Publishing Limited if they have any comments on this retraction.

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Research on Teaching Ability Evaluation Model of University Teachers Based on Computer Big Data Theory

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Abstract. As the backbone theory to guarantee the teaching level of universities, teachers are essential resources for the healthy development of universities. However, some universities are still lack of data support in the process of carrying out the evaluation of teachers' teaching ability, which leads to the evaluation process is not scientific and reasonable, and it is difficult to reflect teachers' real teaching ability objectively and fairly. Based on this, this paper first analyzes the comprehensive evaluation model of university teachers' teaching ability under the big data theory, and then studies the application effect of the teaching ability evaluation model based on the big data theory.

Keywords: Teaching Ability Evaluation, University Teachers, Computer, Big Data

1. Introduction

With the progress of modern information tech represented by computer big data, it has obtained extensive and in-depth research in many fields, and obtained more significant application results. As an important resource and supporting force to guarantee the teaching quality and effect of higher education, teachers are the backbone of implementing teaching reform and promoting educational innovation [1]. Computer big data statistics show that teachers have become the main undertakers of university teaching tasks. Therefore, how to evaluate teachers' teaching ability scientifically and reasonably is of great value to effectively cultivate and comprehensively improve the quality of talent cultivation in universities. Therefore, it is urgent to effectively evaluate the teaching ability of university teachers on account of the theory and platform of computer big data, and analyze the core factors of heroic teachers' ability by constructing evaluation model, so as to lay a scientific base for objective and scientific evaluation of teachers' ability.

On account of the computer big data theory, and study the teaching behavior of university teachers, so as to carry out the teaching effect evaluation and monitor analyze and collect the online learning data. At present, most universities have created digital teaching data platform and system, so that the data generated in the teaching process can be collected and analyzed more effectively, which greatly facilitates the evaluation and research of teaching effect [2]. The application of big data mining in Teachers' ability assessment can find valuable teaching data, so as to carry out quantitative data mining and analysis of teachers' teaching behavior.
With the improvement of teachers' teaching ability gradually becoming an important content and an organic part of the current university reform and innovation, the research on teachers' teaching and appraisal of teachers' teaching ability continues to heat up. The appraisal of teachers' ability is an essential link and step to improve teaching effect and teaching quality. Only by scientifically, comprehensively and dynamically evaluating teachers' teaching ability can it guarantee the continuous improvement of teaching quality and enhance the adaptability and matching between university education and social needs.

In addition, big data, as a relatively mature tech, can not be ignored in the application value and role of University Teachers' ability appraisal. At present, some universities are still lack of data support in the process of teachers' teaching ability appraisal, which leads to the appraisal process is not scientific and reasonable, and it is difficult to objectively and fairly reflect the teachers' real teaching ability. On account of the big data theory, the establishment of the appraisal model of teachers' teaching ability can reflect the real level and ability of teachers on account of the objective data, so as to lay the data support for the improvement of teaching quality, promote the university to make scientific decisions, and ensure the continuous improvement of teachers' level. Therefore, it is of great practical value to study the teaching ability appraisal model of university teachers on account of computer big data theory.

2. Comprehensive appraisal model of university teachers' teaching ability on account of big data theory

2.1. Teaching ability appraisal model on account of improved AHP

In the basic principle and step level of analytic hierarchy process, the use of analytic hierarchy process modeling, first of all, need to establish a hierarchical hierarchical structure model, and then construct all the judgment matrices in each level, and rank the hierarchy and check the consistency [3]. In addition, it is also urgent to rank the hierarchy and check the consistency. The hierarchical structure model of teaching quality appraisal is shown in Figure 1.

![Figure 1. The hierarchical structure model of teaching quality appraisal.](image)

Secondly, it is urgent to determine the index system of university teachers' teaching appraisal. On account of the current university teacher appraisal index, the teacher teaching index origination is established as shown in Table 1. In determining the weight level of the overall goal level, it is urgent to determine the importance of the three sub-objectives of students, peers and experts to the teaching appraisal of university teachers, and construct the judgment matrix of the sub-objective level for the overall goal.
Table 1. The index system of teachers' teaching appraisal.

| Index system       | Components                                                   |
|--------------------|--------------------------------------------------------------|
| Primary indicators | Student appraisal, peer review, expert appraisal             |
| Secondary indicators | Teaching attitude, teaching content, teaching method and teaching effect |
| Third level index   | Theory application, teaching means, teaching organization, teacher-student interaction |

2.2. Fuzzy comprehensive appraisal model of university teachers' teaching

The mathematical model of paste comprehensive appraisal involves three factors: factor set, appraisal set and fuzzy comprehensive appraisal matrix obtained by fuzzy appraisal of each single factor [4]. Among them, the expression of factor set \( U \), comment set \( V \) and comprehensive appraisal matrix \( R \) are as follows:

\[
U = \{u_1, u_2, \ldots, u_n\} \quad (1)
\]

\[
V = \{v_1, v_2, \ldots, v_m\} \quad (2)
\]

\[
R = \begin{pmatrix}
R_1 \\
R_2 \\
\vdots \\
R_o
\end{pmatrix} = \begin{pmatrix}
R_{11} & R_{12} & \cdots & R_{1n} \\
R_{21} & R_{22} & \cdots & R_{2n} \\
\vdots & \vdots & \ddots & \vdots \\
R_{o1} & R_{o2} & \cdots & R_{on}
\end{pmatrix} \quad (3)
\]

Where \( R_{ij} = (r_{i1}, r_{i2}, \ldots, r_{in}) \) is the single factor appraisal of the \( i \) factor \( u_i \), so \( r_{ij} \) represents the membership degree of the factor \( u_i \) on the \( j \) comment \( v_j \). In the compound operation of fuzzy relations, the comprehensive appraisal results can be obtained:

\[
B = A \circ R = (b_1, b_2, \ldots, b_n) \quad (4)
\]

Among them, \( B = A \circ R = (b_1, b_2, \ldots, b_n) \), \( b_j \) represents the degree to which the appraisal object belongs to comment \( V_j \). Weight vector \( A \in F^++(U) \), \( A = (a_1, a_2, \ldots, a_m) \), comprehensive appraisal \( B = A \circ R = (r_{ij})_{m \times n} \), \( B = (b_1, b_2, \ldots, b_n) \). Where \( b_j = \bigvee_{k=1}^m (a_k \wedge r_{jk}) \), in short, the comprehensive appraisal operator is \( M(\land^*, \lor^*) \). It is easy to see that the choice of operator for \( b_j \) to calculate \((\land^*, \lor^*)\) is very important. Different operators can be used to solve different problems in the appraisal of teachers' teaching ability. The purpose of comprehensive appraisal is to select the winning objects from the set of objects, and sort the comprehensive appraisal results of all objects according to the results of formula calculation.

2.3. Multi level fuzzy comprehensive appraisal model

In the construction of fuzzy membership function, the appraisal standard of teacher appraisal should be fair and objective. However, different classes are affected by a variety of internal and external factors, which makes it difficult for them to carry out the teacher appraisal according to the required appraisal standards [5]. Therefore, it is urgent to deal with the unreasonable difference data of appraisal standards. The construction level of fuzzy membership function includes excellent, good, pass and fail membership functions.
Let $x_i$, $y_i$, and $z_i$ represent the appraisal scores of a class, a peer and an expert on a certain indicator of the first teacher, respectively; $x, y, z$ represent the highest appraisal scores of a student, a peer and an expert on a certain indicator of the teacher; $x_i^*, y_i^*, z_i^*$ represent the processing and appraisal scores of a student, a peer and an expert on a certain indicator of the first teacher.

2.4. Fuzzy appraisal results of comment set

Using analytic hierarchy process to get the weight vector of several aspects of student appraisal as shown in Figure 2, and get the fuzzy comprehensive appraisal results of students to teachers. According to the principle of maximum subordination, the comprehensive appraisal results of students to the teacher's teaching are obtained. Similarly, according to the principle of maximum membership, it could get the fuzzy comprehensive appraisal results of peers and experts.

The mathematical model of teachers’ teaching comprehensive appraisal on account of the improved analytic hierarchy process can comprehensively consider the appraisal suggestions of students, peers and experts of teaching supervision group, so as to comprehensively reflect the advantages and disadvantages of teachers' teaching quality [6]. On the base of each objective matrix, the weight of each group is determined on account of the comparative analysis. There are consistency matrix and non consistency matrix in the appraisal model of teaching ability. In addition, the appraisal model of university teachers' teaching ability has passed the consistency test to ensure the rationality and scientificity of the appraisal results.

![Figure 2. The weight vector aspects of student appraisal.](image)

3. Application effect of teacher teaching ability appraisal model on account of big data theory

3.1. The components of university teachers' teaching ability

On account of the big data theory model, the appraisal questionnaire of university teachers' teaching ability is developed, and a relatively rich sample and participants are selected to participate in the questionnaire survey, from which the appraisal of university teachers' teaching ability is obtained. The results of the questionnaire survey are applied to the model, and the distribution of the components of university teachers' teaching ability is obtained. On account of the analysis results of the appraisal model, teachers' scores on each appraisal element can be obtained. In addition, in order to evaluate the current situation of teachers' teaching ability, the score rate of the core elements of teachers' teaching ability is counted, and the results are shown in Figure 3 below.
3.2. Analysis on the appraisal results of teachers' teaching ability

From the score rate data of the core elements of teachers' teaching ability, it can be seen that the current university teachers have a strong amount of strength in terms of professional ability and curriculum ability, but relatively speaking, there is still much room for improvement in their professionalism and teaching quality. It can be seen that by introducing the big data theory into the teaching ability appraisal model of university teachers, the teaching ability of teachers is comprehensively evaluated, and the differences among teachers are compared to generate clustering. However, the use of big data tech, mining its inherent hidden rules, so as to accurately and objectively dig out the characteristics of teachers, develop more effective training strategies, so as to promote the continuous improvement of University Teachers' comprehensive quality.

4. Conclusion

In summary, on account of the big data theory, the appraisal model of teachers' teaching ability is established, which can reflect the real level and ability of teachers on account of objective data. Computer big data statistics show that teachers have become the main undertakers of university teaching tasks. Therefore, how to evaluate teachers' teaching ability scientifically and reasonably is of great value to effectively cultivate and comprehensively improve the quality of talent cultivation in universities. On account of the research of the comprehensive appraisal model of university teachers' teaching ability under the big data theory, this paper analyzes the teaching ability appraisal model on account of the improved AHP, the fuzzy comprehensive appraisal model and the multi-level fuzzy comprehensive appraisal model of university teachers' teaching. Through the analysis of the application effect of the teaching ability appraisal model on account of big data theory, this paper studies the components of university teachers' teaching ability and its appraisal results.

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