Research on the Construction of the Evaluation Index System of College Teachers and the Optimization Measures of Education Management under the Background of Big Data

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Abstract: Under the background of big data, the construction of the evaluation index system of college teachers is an important content of education management, a comprehensive, scientific, objective and fair evaluation of teachers' work, and a strong guarantee for improving the quality of education and promoting the development of education. The core problem of the development of higher education in the new era is the quality of personnel training. To achieve this goal, teacher development is the key. At present, the main problems in the evaluation system of teachers in colleges and universities are unscientific evaluation standards, unreasonable evaluation indicators, untimely evaluation results and inflexible evaluation methods. And these problems, in the final analysis, do not make full use of big data technology for teaching evaluation. In order to solve these problems, it is necessary to optimize the teaching evaluation index system, establish the "big data platform" of education management, improve the feedback mechanism of teacher development, and link the assessment results with performance pay. Based on the core content and basic principles of the construction of the evaluation index system of college teachers in the era of big data, this paper comprehensively expounds relevant theories, establishes the first-level index and second-level index of the evaluation index system of college teachers by Delphi method, constructs the evaluation system of college teachers by combining the analytic hierarchy process and fuzzy comprehensive evaluation method, and proposes to take the evaluation index as the basis. Measures to comprehensively optimize the educational management of college teachers.

Keywords: Big data; Evaluation index system; Colleges and universities

After more than 20 years of development, the evaluation system of teachers in colleges and universities has formed a relatively mature system, but there are still some problems: the evaluation standards are not scientific, the evaluation indexes are not reasonable, the evaluation results are not timely, the assessment ways are not flexible, etc. All these problems restrict the improvement of the quality of higher education in our country. With the development of the Internet and information technology, big data technology provides new ideas and directions for improving the evaluation of college teachers [1]. Big data technology is characterized by openness, unstructure and fast processing speed. It is widely used in the field of education. It can not only optimize the teaching evaluation index system, but also comprehensively monitor the teaching

quality of teachers and improve the accuracy of evaluation results. Therefore, applying big data technology to the evaluation of teachers in colleges and universities is an inevitable requirement for the development of higher education to a certain stage, but also the only way for the construction and teaching management of teachers in colleges and universities to become scientific and standardized.

1. Construction of evaluation index system for college teachers in the era of big data

Educational evaluation is an important content in school management, and the results of evaluation, as the basis for rewards and punishments, are the affirmation and recognition of teachers' work performance [2]. Educational evaluation is helpful to improve teachers' self-development ability and promote the virtuous circle of teachers' self-development. Therefore, educational evaluation can, to a large extent, determine whether teachers have the confidence to continue to engage in educational work and whether they have the courage to renew and improve themselves. At the same time, under the background of the new era, teachers should have a strong sense of responsibility and mission. Therefore, the construction of the evaluation index system of college teachers should be closely combined with the development needs of college teachers under the background of the new era. This is not only a comprehensive evaluation of the professional quality of college teachers, but also an objective evaluation of the teaching level and scientific research ability of teachers. It is also a positive response to the educational reform of colleges and universities in the new era. The wide application of big data technology and information technology in the field of education has brought a new experience to education and changed the traditional methods and management methods. Therefore, it is of great significance to construct a set of scientific, reasonable, innovative and applicable teacher evaluation index system under the background of the new era for the implementation of the national educational policy in the new era.

2. Theoretical basis

The concept of big data comes from the United States. There are four key words in the concept, namely "quantity", "correlation" and "flow", which together constitute the characteristics of big data. In the aspect of data collection, it is embodied in the collection and utilization of unstructured data, and in the aspect of data processing, it is embodied in the integration, processing and mining of structured data. At the same time, big data also includes two dimensions, namely value dimension and relevance dimension. In the value dimension of big data, it can be divided into three aspects: the first is unstructured data; The second is structured data; The third is data analysis. In the big data correlation dimension, it can be divided into six aspects: correlation data, causality, predictive function, correlation and time series. The emergence of big data technology has greatly changed the traditional computing technology. In the context of big data, basically everything should be included in the scope of "network" for analysis and processing, and all things are interconnected through "network". The application of big data technology changes the construction of the evaluation index system of college teachers. The evaluation index system of college teachers constructed based on big data technology has strong practicability and pertinence, which is conducive to the continuous optimization of college teachers' education management.

3. Data sources

Delphi Method (Delphi Method), also known as expert consultation method, is a kind of expert investigation method developed in the late 1960s, it is a famous American scholar, strategic research expert J.R. Professor Derrida. Delphi method is mainly used in multi-field, multi-level and multifaceted complex decision-making, which is a decision-making method that can best give play to the wisdom of experts and ensure the scientificity of decision-making [3]. It is also a multi-stage, multi-step and higher-level expert decision-making method, that is, experts determine indicators through anonymous filling and anonymous processing. Delphi method has been widely used in determining the evaluation index system of college teachers, which is mainly reflected in the following aspects: (1) Establish the investigation team and determine the investigators; (2) Sending questionnaires and retrieving questionnaires; (3) Analyze and process the investigation results and draw conclusions.

4. Index construction

Based on the above analysis, this paper divides the construction of the evaluation index system of college teachers into four stages. The first stage is to establish the first-level index of the evaluation index system of college teachers on the basis of fully collecting and reading the relevant literature, and clarify the meaning and evaluation criteria of each first-level index. In the second stage, each primary index is re-screened by Delphi method, and the secondary index is calculated. In the third stage, AHP and fuzzy comprehensive evaluation are used to evaluate the secondary indexes obtained in the second stage. In the fourth stage, the weights of each index are adjusted according to the scoring results. As can be seen from the

table above, after two rounds of expert consultation, opinions of experts gradually converge, and the first-level indicators of the evaluation index system of university teachers are finally determined, including four aspects: teacher ethics, teaching, scientific research ability, and service to society, while the second-level indicators include three aspects: teaching ability and social service ability.

5. Index weight

Index weight refers to the subjective judgment of experts on the importance of each index, which influences the construction of index system and evaluation results. When constructing the evaluation system of teachers in colleges and universities, various indicators are screened by means of expert investigation, and the importance of each indicator is given weight. Considering that there may be differences of expert opinions in the process of weight determination, the weight of indicators is determined by analytic hierarchy process (AHP), the importance of each indicator is judged according to the scale method of 1-9, and the weight of each indicator is calculated. In this paper, a combination of Delphi method and analytic hierarchy process is adopted in the construction of the evaluation system of college teachers. The first and second indexes established by Delphi method are collected and screened by expert investigation, and the weight of each index is determined by fuzzy comprehensive evaluation method and analytic hierarchy process. During the analytic hierarchy process, the expert opinions are assigned according to the 1-9 scale method, and their weights are determined according to the first-level index and second-level index. In this way, a complete evaluation system is formed, which makes the evaluation results of college teachers more scientific and fair.

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