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Research on the Application of Fuzzy Analytic Hierarchy Process under OBE Concept in the Assessment and Evaluation System of Tax Planning Course

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Abstract

Based on the theoretical framework of the fuzzy comprehensive analysis method of Analytic Hierarchy Process (AHP), the article establishes a course assessment and evaluation system under the OBE concept. The AHP method is used to determine the weight of indicators, and combined with the specific characteristics of the "Tax Planning" course, a fuzzy evaluation matrix and a further fuzzy comprehensive evaluation membership matrix are constructed. Through the fuzzy comprehensive evaluation method, the multi indicator fuzzy comprehensive evaluation of the "Tax Planning" course assessment and evaluation is carried out, Strengthen the comprehensive and comprehensive evaluation of professional teaching, ultimately promoting the improvement of the quality of professional talent cultivation.

Keywords

OBE concept; Tax planning; Course assessment and evaluation; Fuzzy comprehensive evaluation method.

1. INTRODUCTION

Outcome based education (OBE) is an educational philosophy that is student-centered, results oriented, and continuously improving. The OBE concept was first proposed by the American Spady in 1981. With the implementation and implementation of teacher training professional certification and engineering certification in ordinary higher education institutions under the Ministry of Education of China, the OBE concept has led a new round of transformation in China's higher education model. Putting students first, emphasizing student-centered allocation of educational resources, organizing courses, and implementing teaching; Result oriented, emphasizing student-centered learning outcomes and cultivating professional talents based on the core competencies and qualities of college graduates; Continuous improvement emphasizes the comprehensive and comprehensive evaluation of professional teaching and feedback on evaluation results, ultimately promoting the continuous improvement of the quality of professional talent cultivation.

From the existing curriculum evaluation system in Chinese universities, there are problems in the research of curriculum evaluation, such as single measurement methods, incomplete and subjective evaluation content, and incomplete evaluation indicators. Therefore, it is necessary to further improve the content of curriculum evaluation and assessment in universities, and improve performance evaluation methods, especially in the context of teacher training professional certification and engineering certification. How to construct a reasonable curriculum evaluation and assessment system, strengthen the comprehensive and full process evaluation of professional teaching, has become an urgent problem to be solved in promoting the quality of talent cultivation.

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Based on this, this article takes the course "Tax Planning" as the specific research object, reshapes the course assessment and evaluation system under the OBE concept, introduces the Analytic Hierarchy Process and Fuzzy Comprehensive Evaluation Method into the university course assessment to construct a course evaluation and evaluation model, which is conducive to determining the multi-level structure model of assessment and evaluation based on the nature and output oriented overall goals of different courses, and quantifying the factors that are not easy to quantify in course assessment and evaluation, Obtain fuzzy comprehensive evaluation results.

2. DESIGN OF EVALUATION AND ASSESSMENT INDICATORS FOR THE COURSE OF "TAX PLANNING"

The course "Tax Planning" is a undergraduate professional course in business majors such as taxation, accounting, and financial management in universities. It allows students to master the basic theories, methods, and techniques of tax planning. Due to the strong practicality and operability of the course, some teachers pay more attention to the teaching of theories and methods in the teaching process, and lack relevant teaching practice, The disconnect between theory and practice also leads to the inability of classroom teaching of "Tax Planning" to be reasonably applied to the actual tax planning of enterprises.

In order to better measure the results of education and teaching under the guidance of results, this article selects more simplified and scientific classroom assessment and evaluation indicators, and constructs a curriculum assessment and evaluation index system using two levels of indicators: process evaluation and outcome evaluation under the "Tax Planning" course. Based on the basic principle of problem orientation, we will continue to classify, classify, and accurately evaluate under the secondary indicators of evaluation, highlighting the achievement orientation. The design of the assessment index system for the "Tax Planning" course is shown in Table 1.

Table 1. Design of Assessment and Evaluation Indicators for the Course of Tax Planning

Primary indicators	Secondary indicators	Third level indicators
Assessment and Evaluation of the Course 'Tax Planning'	Process evaluation	Extracurricular Innovation Practice
		Participate in scientific research projects
		Students' moral education literacy
		Discipline competition
	Secondary indicators	After class exercise test
		Final exam

3. THE SETTING OF EVALUATION AND ASSESSMENT INDEX WEIGHTS FOR THE COURSE OF TAX PLANNING

Using Analytic Hierarchy Process (AHP) to study the weight of each secondary indicator on the course assessment and evaluation results. Based on the nature of the problem and the overall goal set in the early stage, the Analytic Hierarchy Process decomposes the problem into different constituent factors, and combines the indicator factors according to the mutual correlation and membership relationship between the factors, forming a multi-level analytical structure model. It is a good decision-making method for hierarchical weight analysis.

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Firstly, establish an Analytic Hierarchy Process (AHP) structural model, where the first, second, and third level evaluation indicators correspond to the target layer, criterion layer, and indicator layer, with the following characteristics:

① One indicator at the target level: Assessment and evaluation of the course "Tax Planning" There are two indicators in the criterion layer: process evaluation and summary evaluation There are 6 indicators in the indicator layer, and specific indicators are shown in Table 1.

In the pairwise comparison matrix constructed based on a hierarchical structure model (Table 2), A represents a certain level of indicators, and B1, B2... Bn in the next level represent indicators that have a membership relationship with A.

Table 2. Paired comparison matrix between layer A and layer B

A	B1	B2	…	Bn
B1	1	a_{12}	…	a_{1n}
B2	a_{21}	1	…	a_{2n}
…	…	…	…	…
Bn	a_{n1}	a_{n2}	…	1

The pairwise comparison matrix aij=Bi/Bj represents the importance of the i-th indicator relative to the jth indicator and is quantified, as shown in Table 3.

Table 3. Definition of Comparative Scale of Analytic Hierarchy Process in the Assessment and Evaluation of the Course "Tax Planning"

Scale	Meaning
1	Indicator i is equally important as indicator j
3	Indicator i is slightly more important than indicator j
5	Indicator i is more important than indicator j
7	Indicator i is more important than indicator j
9	Indicator i is absolutely more important than indicator j

The course 'Tax Planning' can obtain judgment data (1,3,5,7 or 9) for each teacher's comparison of pairwise indicators through a questionnaire conducted by the teaching and research department, and construct a paired comparison matrix. The diagonal element in the matrix is 1, indicating that each element is equally important as itself, and the pairwise comparison matrix satisfies aij=1/aji. After consistency testing, the eigenvector corresponding to the maximum eigenvalue of matrix A is obtained, and the final vector obtained through normalization is the corresponding weight of the indicator. The weight calculation of each third level indicator and its corresponding second level indicator in the indicator system can be obtained through the Analytic Hierarchy Process, and the weight judgment vector of each second level indicator can be obtained, represented by Wi:

Wi={Wi1, Wi2... Wij} (Equation 1)

I represents the i-th second level indicator, j represents the number of third level indicators included under the i-th second level indicator, and Wij represents the weight value of the jth

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third level indicator relative to the i-th second level indicator. Similarly, the weight values of each secondary indicator in the assessment and evaluation index system of the "Tax Planning" course relative to the primary indicator are obtained.

4. OPTIMIZATION OF ASSESSMENT AND EVALUATION METHODS FOR THE COURSE OF TAX PLANNING

After assigning weighting evaluation indicators, this article further optimizes the current qualitative analysis based curriculum assessment and evaluation method, and makes a more scientific, reasonable, and practical quantitative evaluation through the fuzzy comprehensive evaluation method.

The fuzzy comprehensive evaluation method mainly decomposes a comprehensive evaluation problem into several evaluation indicators, determines the weight vector and weight judgment matrix of each indicator, and then performs fuzzy operations on the matrix and indicator weight vector to obtain the comprehensive evaluation result.

The evaluation grade is set according to the specific situation of each university. Assuming that the above assessment and evaluation indicators of the course "Tax Planning" are divided into four grades - excellent, good, pass and fail, the Delphi method method is used to require relevant teachers in the teaching and research section to give an evaluation (excellent, good, pass or fail) on the specific situation of the three-level assessment and evaluation indicators, and further obtain the fuzzy evaluation matrix of the evaluation indicators:

Ri={V1, V2, V3, V4} (Equation 2)

V1 represents the proportion of teachers rated as "excellent" to the total number of teachers, V2, V3, V4, and so on. Among them, V1+V2+V3+V4=1. For example, if the total number of invited teachers is A, for a certain evaluation indicator, a1 teachers give a "pass" evaluation to their children. The calculation method for the "pass" membership is a1 divided by the total number of teachers A, and the pass membership is a1/A; Similarly, there are a2 teachers who are rated as "excellent", and the membership level of "excellent" is a2/A; In addition, all three teachers gave a "good" evaluation, with a "good" membership level of a3/A. After summarizing all the data, the fuzzy evaluation matrix for this indicator is obtained: Ri={a2/A, a3/A, a1/A, 0}

Combining equations 1 and 2, construct a membership matrix for fuzzy comprehensive evaluation:

Bi=Wi * Ri (Equation 3)

Among them, Bi represents the comprehensive fuzzy operation results of each third level indicator under the i-th second level indicator, and the "evaluation level" corresponding to the maximum membership degree is the comprehensive evaluation result. By knowing the weights of each secondary indicator and the fuzzy evaluation matrix of that indicator, the first level indicator can be obtained, which is the comprehensive fuzzy calculation result of the assessment and evaluation of the "Tax Planning" course.

5. CONCLUSION

This article embeds the Analytic Hierarchy Process (AHP) and Fuzzy Comprehensive Evaluation (FCE) into the assessment and evaluation system of the "Tax Planning" course, deeply implementing the educational concept of result oriented and continuous improvement, so that the practical application of AHP and FCE has more choice space and possibilities. The application of fuzzy analytic hierarchy process under the OBE concept in the assessment and evaluation system of the "Tax Planning" course is not only beneficial for motivating university teachers to invest more enthusiasm and energy in teaching, but also for promoting the

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continuous and in-depth development of the assessment and evaluation system in classroom teaching in universities.

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