Construction of Micro-class Evaluation Index System Based on Hierarchical Analysis

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Abstract: The evaluation index of micro-courses, multimedia courseware evaluation indicators and evaluation criteria of network video course resources are screened, classified and summarized, combined with the characteristics of micro-courses, the evaluation index of micro-courses is constructed. Finally, the author uses the hierarchical analysis method to process the relevant data on the basis of taking full account of the relationship between the various factors of micro-course, and gets the weight of the indicators. Finally, a system of evaluation indicators of micro-courses consisting of 3 first-level indicators and 10 secondary indicators was constructed.

1. Introduction

Micro-class is still in the construction stage, the quality of micro-class is also good and bad, then a unified set of evaluation standards for learners to screen really high-quality suitable micro-class learning resources, for teachers to provide micro-class quality norms, for the construction of micro-class resource library is particularly important. However, at present, the research on micro-courses is still limited to the theory, design development and application of the research, the study of micro-class evaluation is still relatively scarce [1].

2. The Meaning of Micro-Classes

At present, there is still no unified definition of micro-courses in the whole academic circle and education industry. Through the analysis and comparison of the definition of micro-classes by various scholars in China, combined with the author's application and understanding of micro-classes, the author believes that micro-classes are based on short and concise micro-teaching videoas as the core, is for a teaching knowledge point (focus, difficulty, doubt, test points, etc.) or teaching links (learning activities, themes, experiments, tasks, etc.) and carefully designed and developed, supporting a variety of learning methods of a learning resource package [2].

3. The Status Quo and Characteristics of the Development of Micro-Courses in Colleges and Universities

At present, the definition of micro-class in the domestic academic circles has not been unified, because of the different emphasis, the definition of micro-class is not the same, but the characteristics of micro-classes are the same. One is clear objectives. The content of micro-class teaching is generally the content of the difficult point of teaching. Second, the content is short. The total capacity of micro-classes is small, teachers and students can watch the video smoothly, suitable for the needs of mobile learning. Third, the time is short. Micro-class video length should not be more than 10 minutes, 5 to 8 minutes is most suitable, according to different disciplines, different learning objects slightly different. MIT researchers analyzed 6. 9 million video viewing records and concluded that less than six minutes of video was more appealing [3].

3.1. From a Cognitive Point of View, the Awareness of the Importance of Micro-Classes Has Been Further Enhanced

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The training of talents in higher vocational colleges is based on the vocational position, which is based on the goal of adapting to the needs of society and training the ability of technology application as the main line of training. Faced with the problems of lack of self-confidence, lack of learning motivation and lack of sustainable learning among vocational students, more and more teachers in higher vocational colleges realize that micro-class as an effective means can help the teaching and learning subjects in the classroom to better achieve their teaching goals [4].

3.2. From the Perspective of Development, Although the Micro-Course Has Made Progress, There is Still a Great Room for Improvement

With the promotion of different levels of micro-course events and the impact of various types of micro-course development technology training, in recent years, the quality of micro-course development of teachers in vocational colleges has gradually improved [5]. From the national university micro-course teaching competition official website of higher vocational works display, most of them are clear theme, compact content, careful teaching design, animation effect, video production is well-made, those to the classroom record, pure PPT recording screen as the representative of the micro-class type has disappeared. Taking Nanjing City Vocational College as an example, as of July 2017, from the two rounds of school-level multimedia teaching resources construction, micro-course construction accounted for 88% and 87% of the total number of items, respectively, micro-courses have become the most important development projects in the field of digitalization of school teaching resources. At present, the school's multimedia teaching resource library has accumulated 194 micro-class video, most of the video can meet the requirements of micro-class independent learning [6].

4. Principles of the Construction of the Micro-Class Evaluation Index System

The evaluation of micro-class should first consider its practicality, and the research of this paper also focuses on evaluating micro-class from the practical aspects of micro-class. The practical evaluation index system of open university micro-courseshould should objectively reflect the production level of micro-course producers, the grasp and explanation of knowledge points by teaching staff and the actual acceptance effect of learners, and we cannot select some indicators that are not related to the practical effect of micro-courses, and the indicators that cannot be accurately measured should be removed. In order to evaluate the practical effect of open university micro-courses scientifically, effectively and truthfully, this paper mainly follows the following basic principles when designing the system of practical evaluation index of open university micro-courses [7].

4.1 Pointing Principle

The evaluation system must make an accurate and effective determination of the evaluation object. Because of the practicality of micro-class as the evaluation object, the selected indicators need to make an objective and true description of the practicality of micro-classes, the selected indicators should be pointed, only in this way can we ensure the effectiveness of the evaluation system. The evaluation index selected in this paper is closely related to the goal of the practical evaluation of micro-course, and is very targeted. The principle of pointing is the basic principle of design ingesting evaluation system, and it is also an important basis to consider whether the setting of various indicators in the evaluation system meets the practical goal of evaluating the micro-course spree of open university [8].

4.2 The Principle of Combining Dynamics With Static

The practicality of micro-courses in open universities is in the process of dynamic development, so the evaluation index system constructed in this paper must also be dynamic and reflect the dynamic improvement of the practicality of micro-courses. At the same time, the value of the indicatorselected in the empirical evaluation is the cross-sectional data for certain micro-courses at some point in time, which is used to reflect the actual situation of the practicality of the open

university micro-courses at that time [9].

5. Establish a System of Micro-Course Evaluation Indicators Based on Layer-Level Analysis

In the 1970s, the American scholar Sadie founded the Hierarchical Analysis Method (AHP) and applied it to the field of educational evaluation. Based on subjective judgment, the hierarchical analysis method uses standardized and quantitative methods to compare the indicators of each dimension in the indicator system, to draw an important one, and then determine the important level according to the different values, and then use the matrix algorithm to calculate the weight allocation values of the indicators at each level. Under the calculation process of hierarchical analysis, it is described in detail:

5.1 The Basic Principles of Hierarchical Analysis

The hierarchical analysis method is the first to introduce the field of educational evaluation by T. S. Saty, an American scholar, to determine the weight coefficient of the evaluation index. This method is a systematic analysis method, which first requires the hierarchy of problems, according to the nature of the evaluation object to break down the evaluation target into different categories of systems and different levels of indicators, and then the same level of indicators two comparison, to judge the relative importance of the results of the comparison according to the given scale of quantification, and finally through statistical calculation, to obtain the weight of the indicators of the layer. This is a method of normalizing and quantitativeizing people's judgment and comparison, which can reduce many uncertainties to a great extent, so it is a scientific method for determining weights.

5.2 Construction of the Step Hierarchy

According to the principle of hierarchical analysis, on the basis of the author's systematic analysis of the micro-lesson, it is broken down into elements, and these elements are divided into several groups according to the different attributes, forming different levels. Elements at the same level dominate certain factors of the next level as criterion, and they are dominated by the elements of the previous layer. This top-down dominant relationship forms a class. To this end, the author has a micro-course evaluation index, multimedia courseware evaluation index and network video curriculum resources evaluation criteria for a deep study, summarized a large number of evaluation indicators, and the indicators are summarized, and combined with the characteristics of micro-courses, initially formed a micro-course evaluation index system composed of three first-level indicators, 10 secondary indicators of the initial framework such as table 1.

Table 1 Evaluation indicators for micro-courses in Table 1

Topic design	The choice is concise.	Teach for a small knowledge point or a specific problem, try to be small and refined
	Focus on	Selecting topics conforms to students' learning needs, focuses on common, typical and representative problems or contents in teaching, and can effectively solve the key points and difficulties in the teaching and learning process.
	Clear goals	The teaching object is positioned accurately and has clear and concise teaching objectives
Content design	Content Science	The content is rigorous and substantial, no scientific, no policy error, can reflect the development of society and discipline
	The design is reasonable	Organization and arrangement conform to students' cognitive law, and can highlight the subjectivity of students and the organic combination of teaching and learning activities
	The method is	Reasonable use of information technology

	appropriate	means, the appropriate choice of teaching media, teaching aids good results.
	New form	New ideas, creative, recording methods and tools can be freely combined, such as with a hand-set, electronic whiteboard, etc.
Work specifications	Structural integrity	The video head should show the title, author, unit, the main teaching link has subtitle prompt
	Language specifications	The language explained by teachers should take into account professionalism and artistry, combine teaching needs, choose the appropriate rhythm of explanation, and be able to arouse and maintain the attention of students.
	Reusability	Flexible embedding in different contexts of teaching and smooth playback on common devices
	Technical specifications	Micro-class video time is generally no more than 10 minutes, video quality is clear, image stability, sound is clear, sound and picture synchronization

5.3 Construct a Reasonable Comparative Judgment Matrix

Using Sati 1-9 scale scale method, according to the selected experts, students and other respondents according to their own judgment of things good or bad, good or bad, light and heavy experience methods on the relative importance of the indicator to make two comparative judgments, and the comparative judgment results are quantified, we can get a comparative judgment matrix. The scale scale table is as detailed in Table 2:

Table 2 The scale scale table is as detailed

Serial number	Importance level	Scale
1	Compare the two, the same importance	1
2	The former is slightly more important than the latter.	3
3	When comparing the two, the former is obviously more important than the latter.	5
4	The former is more important than the latter.	7
5	The former is more important than the latter.	9

5.4 Level Total Ordering and Consistency Test

The process of total leveling is done from high to low level. Generally can take a relatively simple method to calculate, the final weight value of all levels of indicators in the construction of the evaluation index system by a certain level of indicators in the single layer of the weight value of its counterpart to the superior indicator single-layer weight product decision. If there is an error in the indicator weight value, it needs to be adjusted, adjusted and then the combination weight is tested consistent, the method is the same as the third step consistency test, CR is only valid if the condition is less than 0. 1. If this condition is not met, the judgment matrix is reconstructed and then tested until the consistency test is passed.

6. The Establishment of the Initial Weight

According to the same calculation steps of the hierarchical analysis method, the weights of the indicators of the indicator system can be calculated as shown in Table 3:

Table 3 The weights of the indicators of the indicator system can be calculated

Evaluation indicators for	Choice Design 0. 2	Selected concise 0. 12
		Focus 0. 05
		Target 0. 03
	Content Design 0.	Content Science 0. 2

micro-courses	53	Reasonable design 0. 12
		Method fit 0. 1
		Form Novel 0. 11
	Specification 0. 27	Structural integrity 0. 1
		Language Specification 0. 12
		Reusability 0. 02
		Technical specification 0. 03

After obtaining the weight of the indicators of the practical evaluation index system of open university micro-courses, this index system can be used to evaluate the practicality of a particular micro-course. In fact, the study of the practical evaluation system of open university micro-courses is a process of continuous circulation of theoretical construction and practical application, which also needs to be enriched and perfected continuously according to the results of the practical test of micro-course evaluation.

7. Conclusion

As a new research field in the field of education, the related research is still in the primary stage, and it is more ambiguous to evaluate micro-class, so it is of great practical significance to study the evaluation method of micro-course in depth. This paper uses hierarchical analysis to establish a micro-curriculum evaluation index system consisting of 3 first-level indicators and 10 second-level indicators, and gives it weight. Compared with the general evaluation method, the weight distribution determined by the hierarchical analysis method is more reasonable, the evaluation results are more reliable, the operability is stronger, the whole evaluation step is clear, the evaluation rules are simple, the quantitative index and the data processing part can be realized by computer software.

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