

# Comparison and Analysis of Performance-based Attribute Mathematics Model and Fuzzy Mathematics Model

Fan Miao

Xi'an International University, Xi'an, Shaanxi, 710077, China

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**Abstract:** Attribute mathematic model consists of three parts: single index attribute measurement analysis, multi-index comprehensive attribute measurement analysis and attribute recognition analysis. Moreover, by introducing the method of fuzzy mathematic model to evaluate the teaching quality of University teachers, this paper tries to put forward an improvement plan for the traditional teaching evaluation system of universities. Based on the performance, the author compares and analyses the attribute mathematic model and the fuzzy mathematic model. The research shows that compared with the general evaluation method, the attribute comprehensive evaluation method is rigorous and precise, and overcomes the shortcomings of the fuzzy evaluation method. The attribute measurement method pays attention to the "order" of the assessment space, and gives a reasonable confidence identification criterion and ranking criteria to make the evaluation result clearer and more reasonable.

## 1. Introduction

At present, all colleges and universities in China have begun to fully recognize the importance of teaching evaluation, and gradually take teaching quality assessment as one of the daily tasks of teaching management [1]. Evaluation is the product of the development of human cognition level to a certain stage, which makes the evaluation subject discover the object value # an effective method to reveal the object value and use the object value [2]. Objective things are classified by establishing fuzzy similarities. Correctly handling the relationship between the short-term effects of investment plans and medium- and long-term goals is the basic principle of investment [3]. With the further development of the market economy, the investment subject is the same as the market subject, and all the responsibilities and risks will be assumed by the enterprise. The enterprise must be in an invincible position in the fierce competition. The most important and most common form of examination is the examination paper [4]. Therefore, the paper quality evaluation is the basic method of evaluating the examination quality, testing the reliability and validity of the examination, is the basis of improving the examination work and the quality of the examination paper, and is also an effective way to obtain feedback information of teaching effect [5]. Target recognition includes three levels of meaning: identification, classification and identification. Discrimination refers to distinguishing the differences between targets [6]. Classification is to distinguish the category attributes of targets on the basis of discrimination. Recognition is to confirm the specific characteristics of targets on the basis of identification and classification. The evaluation of teaching quality for university teachers is generally carried out through four links: student evaluation, expert evaluation, peer evaluation and teacher self-evaluation, and then the final evaluation results are comprehensively considered.

Evaluation refers to a kind of cognitive activity that makes value judgments of things by using specific indicators, comparing with unified standards and adopting prescribed methods in order to achieve certain purposes [7]. However, in the process of establishing, using and analyzing the evaluation results, there are still some problems that have not been completely overcome, such as the research of evaluation theory, the update of evaluation methods, the analysis of evaluation data, etc. [8]. Generally speaking, evaluation has four functions: judgment function prediction function selection function and guidance function. Fuzzy mathematics is the science of studying and dealing with fuzzy phenomena. It reveals a kind of uncertainty in the division caused by the intermediary

transition of the differences between objective things. In addition to strict enterprise management, improve system construction, improve product quality, reduce production costs, and active marketing ideas, the most important thing is to determine investment decisions [9]. In order to ensure the quality of the test paper, it is extremely important to comprehensively and reasonably evaluate the quality of the test paper. However, how to improve the quality of the test paper evaluation and make the evaluation based on scientific and reasonable is an important issue that needs to be solved. The target recognition we refer to refers to the highest level of target recognition [10]. These problems affect the realization of teaching quality evaluation function and the potential ability of teachers.

## 2. Blur Concept with Fuzzy Collection

Every concept has a certain extension and connotation. Epitaxy is all objects that are adapted to this concept. Connotation refers to the essential properties of all objects contained in the extension. In order to achieve the comprehensiveness of the indicators of the teaching evaluation system and the balanced and reasonable distribution of the weights of the indicators, the teacher's true teaching quality is evaluated more comprehensively and dynamically. The core of its evaluation thought is based on the assumption that the evaluation results can be superimposed and the evaluation factors are linear. The connotation is the attribute of the set, and the extension is all the elements that make up the set. For this reason, many scholars have made extensive and in-depth research on the quality evaluation of examination papers. They use statistical methods to analyze various evaluation indicators and their relationship, and use analytic hierarchy process, extension evaluation method, fuzzy comprehensive evaluation method to analyze and evaluate the quality of the test paper. Therefore, on the basis of analyzing and studying the factors affecting the target attribute recognition, the attributes used in the attribute recognition system can be selected according to the difference of the non-specifiability of each attribute.

Table 1 lists the primary and secondary indicators of the teaching quality evaluation system used in this evaluation model.

Table 1 Indicators of Teaching Quality Assessment System

First level index	Two level index
Teaching attitude	Careful after-class counseling; love teaching, have a sense of responsibility to prepare lessons adequately, skilled in class; on time to go to and from class, not absent from class
Content of courses	The point of view is elaborated accurately; the details are appropriate, the progress is appropriate, the key and difficult points are prominent; the combination of practice and pertinence is strong.
Teaching method	Teach students in accordance with their aptitude and be good at inspiration; Appropriate methods and lively forms; Emphasize practice and pay attention to ability; Live and lively, from shallow to deep.
Teaching ability	Clear layers, clear logic; neat blackboard writing, clear language; moderate speed and volume; concise language, attractive
Teaching effectiveness	Students' learning effect is obvious; students' achievement is obviously improved; students' interest in learning is stimulated; classroom questions, homework corrections

Attribute mathematical model and fuzzy mathematical model are completely different in each part. Compared with ordinary evaluation methods, this method can weigh all kinds of factors better, ensure that information is retained to the greatest extent, and truly enable each person involved in the evaluation process to play a corresponding role, so as to achieve a comprehensive and dynamic evaluation. At present, most of the existing teaching evaluation uses this method. But in fact, this assumption is not valid, so it is often unsatisfactory to use, and the credibility of the evaluation results is poor. It reflects the compression rate of formation and indicates the effect of formation

compression on wellbore. The greater the compression rate, the more disadvantageous the wellbore. The whole system can be divided into three subsystems: single-index performance function analysis subsystem, multi-index comprehensive performance function analysis system, and recognition subsystem. The current survey results show that most colleges use the quantitative teaching quality evaluation index system, which is generally to evaluate the teacher's teaching content, teaching methods, teaching attitudes, teaching effects and teaching ability.

### 3. Overview of Fuzzy Comprehensive Decision

This model is different from the traditional simple average algorithm, but uses the fuzzy comprehensive evaluation method. When each factor is a fuzzy concept, and the weight is also ambiguous, the traditional total score method and weighted average calculation methods are not applicable. In fact, the evaluation object of the teaching contains a variety of attributes. These attributes reflect different characteristics of the evaluation object from different aspects, and these characteristics often have a certain degree of ambiguity, that is, they have nonlinear characteristics. Moreover, the degree of development of various factors and the damage of wellbore are non-linear. The quality of test paper is influenced by many factors. The accumulated surface subsidence ( $y_2$ ). Indicators used to reflect the degree of formation compression deformation. It is generally believed that the greater the cumulative surface subsidence, the worse the wellbore stability. Based on this idea, we construct a fuzzy mathematical model for teaching evaluation of University Teachers Based on educational statistics.

On the importance of decision-making, Nobel Prize winner Simon said: "Management is decision-making". It reflects the disturbance degree of formation compression deformation to wellbore, that is, the influence of additional force. After the evaluation experts grade the technical and commercial tenders of each bidding project according to the evaluation methods, the evaluation system automatically generates the evaluation results report and the evaluation database, and forms the evaluation results of the bidding experts for the bidding project. BIn addition, the method of this paper avoids the misjudgment that may occur when the quality of the test paper is judged, and the evaluation result is more credible. Further, the scoring standard can be formulated to give the score of the quality of the test paper. In the actual discriminating process, the attribute The selection of the set, the determination of the weight value and the acquisition of the cost matrix are all prior knowledge. In the response process of the entire identification, only the attribute measure of the target for each attribute needs to be obtained. For example, in the production and operation process, such problems are often encountered. Decision makers face several different natural states, and it is possible to adopt different solutions. Conditions and time force you to choose one of them quickly. The optimal solution is implemented.

At present, China's comparative research on attribute mathematical model and fuzzy mathematical model is receiving attention. Figure 1 is the current research status of this kind of project in China.

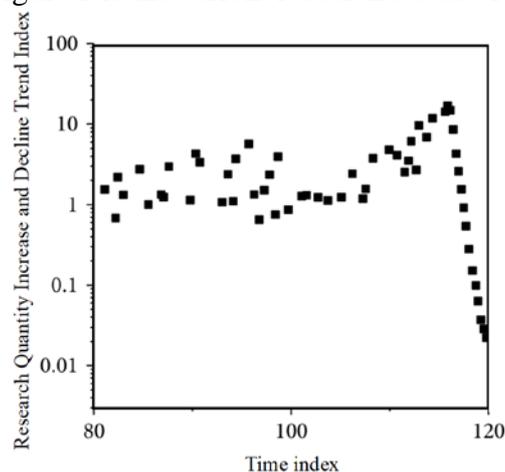


Fig.1. Related research trends in recent years

#### 4. Conclusions

Based on the attribute set and attribute measure theory, we propose the attribute mathematical model of quality evaluation, which is completely different from the fuzzy mathematical model. Application examples show that the attribute mathematical model is more reasonable. In summary, the model and case application can be seen in the process of using the fuzzy comprehensive assessment in the actual teaching evaluation process. The equilibrium distribution and weight values of different evaluation factors are determined, making the results of the assessment more comprehensive and more objective. The information release area is mainly used to publish information such as bidding, flow labeling, winning bids and extensions of the project, so that the users of the system can understand the relevant information as soon as possible, so as to make corresponding decisions in time. Finally, it should be pointed out that different evaluation departments will adopt different evaluation indicators when evaluating, and the calculation methods of the indicators will also be different. For subjective and objective problems, different index calculation methods are sometimes given, and the range of index values and classification criteria are also different. Then through in-depth study, we can understand the situation of each of our aircraft in the battlefield in more detail, which provides a good technical support for enriching the flexibility and cooperation of specific operations. Multi-attribute recognition will eventually be the development trend of the future identification of enemy and foe.

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