

Research Article

Performance Evaluation and Management Method of Music Tutoring Schools Based on Analytic Hierarchy Process

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On the basis of summarizing the relevant theories of performance management at home and abroad, the important role, significance, and development trend of performance management in music tutoring schools are analyzed. Starting from the actual management of music tutoring schools, taking a music tutoring school as an example, this article comprehensively analyzes the current situation of the school's performance assessment. Considering that the constructed index system is a multilevel comprehensive index system, the analytic hierarchy process is used to give weight to the index. The calculation method and calculation steps are described in detail, and the weight of each index is obtained. Through the design and implementation of the school's performance management system, solid theoretical and institutional support will be provided for the school to achieve sound development in the future. It is expected that the design of this performance can provide reference for such private schools in the country and promote the healthy and sustainable development of private training institutions in China. Let more schools and learners share the nectar and dividends brought by the system reform.

1. Introduction

With the development of the economy, people's living standards and ideas are changing. People are paying more and more attention to education [1, 2]. The concept of quality education permeates every family, and parents pay more and more attention to their children's art education. Education in public schools can no longer fully meet the expectations of parents for their children, and various training schools have sprung up in the market. The private training school curriculum has covered all levels of children from kindergarten to higher education. There are both independent and hybrid schools, and the content of their training basically covers all types. Private schools have become an indispensable part of the country's education system. It has emerged as a significant force on the stage of our society. Private schools are not only the product of the country's education marketization reform, but also the necessity of social economic development. Each of us must also welcome it with a positive attitude. In this context, the characteristics of the school and the quality of the school's

teaching will directly affect the survival and development of the school. It has also become an important reference standard for our evaluation and selection of schools. Teaching quality determines everything, and teaching characteristics guide everything. In the whole process, teachers as human resources undoubtedly play a crucial role. How to build a unique music training school that meets market demand has become the key to gaining a competitive market advantage [3].

Data show that more than 90% of junior high school and primary school students in large- and medium-sized cities have participated in extracurricular training. The percentage of musical instrument training is as high as 48%. In addition to the student body, the proportion of adults favoring musical instrument learning is also on the rise. Several musical instrument training schools have sprung up, and they are also opening their doors to adults. However, the main force of the market is still the student team. The annual winter and summer vacations are the peak season for musical instrument training. Children of all sizes always crowd the classrooms of training institutions [4, 5].

Internal and external training markets and private training schools are developing rapidly. With the advent of the knowledge economy and the increasing pressure of employment and further education, the training and education market has expanded rapidly and maintained rapid growth. In foreign countries, training and education has a wide range of various types of education and training, from the improvement of adult vocational ability to youth. According to statistics from the Ministry of Education of China, the number of students trained by private training schools in 2022 will reach more than 30 million. It is estimated that the total value of the music training market alone is expected to reach RMB 10 billion in 2022. Education and training has become a huge market that cannot be ignored. From 2012 to 2022, the growth trend of the number of music training students in China and the total value of the music training market during the 10-year period is shown in Figure 1.

However, there are many problems in the performance evaluation index system of music training schools. Most of the performance evaluation indicators of private training schools are single and cannot comprehensively and reasonably evaluate school performance. The evaluation system also focuses more on indicators related to financial benefits. It ignores indicators of teacher professional development [6]. It pays attention to the evaluation indicators of teaching output and ignores the evaluation indicators of teaching input. It pays attention to the indicators of students' academic performance and ignores the indicators of moral education. At the same time, the management level of music training institutions is generally backward and lacks the concept of performance management. Although the industry has great potential for development, the art education industry of "big market, small workshop" is still in the initial stage of growth. Music training institutions in the market are mixed, and the competition is fierce. In addition, differences in regional resources and teaching models will also make it difficult for educational institutions to replicate on a standardized scale. As a result, the market concentration is low. From the perspective of consumers, more than half of consumers prefer the introduction of relatives, friends, and acquaintances when choosing an art education institution.

The purpose of this article to study the performance evaluation and management methods of music tutoring schools is as follows.

- (1) A scientific and reasonable performance evaluation index system for music training schools suitable for China's national conditions can be constructed.
- (2) It can provide theoretical basis and countermeasures for the scientific and reasonable performance appraisal of music tutoring schools.

The research on this issue has the following significance.

- (1) Theoretical significance

The evaluation index system needs to be studied. Through the use of scientific methods, an assessment index system adapted to the characteristics of

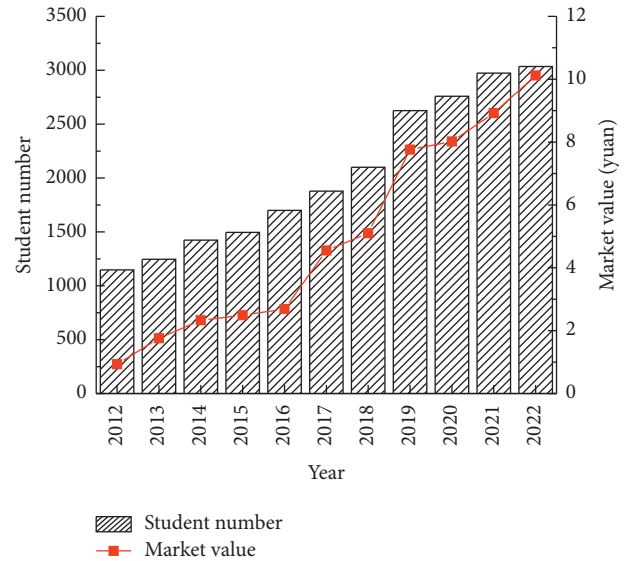


FIGURE 1: Growth trend of the number of music training students and the total value of the music training market in China.

Chinese music tutoring schools is constructed. The performance appraisal indicators are collected through expert consultation and literature review, and then the appraisal indicators are screened, scientifically classified, and the corresponding weights are determined. By establishing an assessment index system for music tutoring schools, China's performance assessment theory will be further enriched.

(2) Realistic meaning

By providing music tutoring schools with a scientific and reasonable teacher performance evaluation index system that can be used for reference, the development of human resource management in music tutoring schools will be promoted and the school will have a core competitive advantage. Efforts shall be made to create an institutional environment that is conducive to outstanding talents to stand out and develop their talents, and to form an employment environment in which outstanding talents gather. Performance appraisal should not only provide services for teachers' appointment and promotion, but also become an effective way to improve their quality and promote their development.

2. Definition of Related Concepts

2.1. Performance. The meaning of performance is very broad, and it is generally interpreted as achievement and effectiveness. It reflects the achievements and achievements of people engaged in a certain activity. It was first used in social and economic management, and later it was widely used in human resource management. But there is no generally accepted academic definition. With the existing definitions of performance, it can be divided into the following four categories: (1) purposeful behavior; (2) work

ability and skills; (3) output results, work completion, and contributions; and (4) process, output, and impact. First, it highlights the combination of behavioral processes and results [7].

Some important dimensions of visible performance are behaviors, processes, outcomes, or achievement of organizational goals and impact on the future. Therefore, the definition of performance includes the following three elements [8, 9]: results compared to organizational goals, actions to achieve those results, and expectations of future benefits from these actions and results. Based on these considerations, this article defines “performance” as the combination of the above elements. The logical relationship of these basic elements is that appropriate action achieves the outcome of contrasting goals. These actions and outcomes have an impact on the environment and the future, and the impact on the future can only be predicted or expected.

From a vertical perspective, performance is generally divided into three levels: overall organizational performance, department or team performance, and individual employee performance. Individual employee performance refers to the sum total of employees’ work results, work behaviors, and work attitudes in a certain period of time. Organizational performance refers to the quantity, quality, efficiency, and profitability of the organization’s tasks within a certain period of time (as shown in Figure 2). Individual employee performance is the foundation. The individual performance of multiple employees is combined as department or team performance. The overall performance of an organization is a combination of the performance of multiple departments or teams.

2.2. Performance Evaluation. Performance evaluation, also known as performance appraisal, or performance appraisal, or grade. Research on performance evaluation is widely distributed in economics, management, organizational behavior, and other disciplines. In the subject, scholars have different understandings and definitions of performance evaluation based on their respective disciplinary perspectives. At present, the definition of performance evaluation in academic circles is mainly divided into the following two types [10].

- (1) In the field of human resource management of enterprises, performance evaluation is mainly related to employee promotion and salary. Therefore, in modern enterprise management, performance evaluation is to use systematic methods and principles to evaluate and measure employees’ work behavior and work effects in their positions.
- (2) In public utilities management, performance evaluation is essentially to evaluate the degree of achievement of goals and the use of funds by formulating performance goals for government departments to use financial funds, designing evaluation indicators and standards, and using appropriate methods. The federal government began

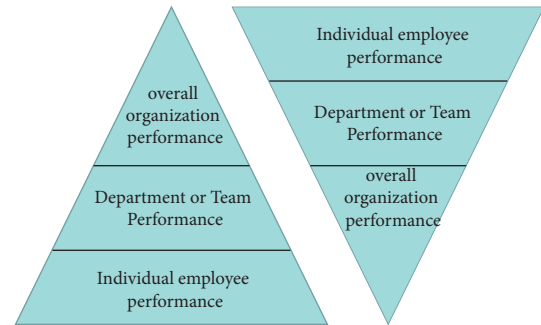


FIGURE 2: Three levels of organizational performance.

evaluating its employees in 1842. At the time Congress passed a lawyers amendment. The proposal would require government departments to conduct annual job evaluations of clerks. Since then, performance appraisal procedures have become popular in government and private companies large and small.

Many experts and scholars at home and abroad have made various definitions of performance evaluation from different research angles. The main definitions of performance are as follows [11].

- (1) Employees in an organization can be sorted by size of contribution.
- (2) Qualifications, habits, personalities, and attitudes of individual employees and the relative value of the organization are systematically and objectively evaluated. It formulates employee competencies, work status, and adaptability for the purpose of seeking truth from facts. It is the sum of the procedures, norms, and methods of assessment.
- (3) Reasonable evaluations need to be made regularly, systematically, and as objectively as possible. It is possible to tap the competency of the employee’s position and the potential to take on higher level positions.
- (4) It is an important part of the personnel management system. The assessor observes and records the daily performance of the assessee. And on the basis of facts, the assessment is carried out through specific purposes to achieve the purpose of cultivating, developing, and improving the ability of members of the organization.

2.3. Performance Management. Often people talk about performance management when they talk about performance appraisals. Performance management is not a single step or aspect. It covers both organizational performance and individual employee performance, but is closely related to performance evaluation [12]. In a sense, it is the development and extension of performance evaluation. Performance evaluation is an integral part of performance management in terms of coverage. Performance management first emphasizes the systematic management of

performance. Its distinctive feature is the goal and direction of performance management, while focusing on process guidance. Through continuous communication and guidance, evaluation, and feedback, necessary improvement or improvement measures are formulated. This not only achieves the rational development and full use of human resources and enhances team cohesion, but also improves the economic benefits of the enterprise. Ultimately, the overall strategic goals of the enterprise can also be achieved. The performance management process is a continuous cycle of systematic engineering. Figure 3 shows the relationship between the different links in this system [13, 14].

2.4. The Role of Performance Management

- (1) The importance of performance management to an organization

Performance management can save the time cost of managers. Performance management allows employees to define their tasks and goals. They will know what leaders want them to do, what decisions they can make, what they should do, and when they need leadership guidance.

- (2) The importance of performance management to employees

Performance management affects the motivation of employees and also helps to restrain employees' work behavior. Therefore, reasonable and effective performance management can not only improve the efficiency of enterprises, but also regulate the behavior of employees.

3. Applying Theory of Performance Evaluation and Management in Music Tutoring Schools

At present, the evaluation methods of performance management include: management by objectives, key performance indicators, balanced scorecard, and analytic hierarchy process. Each music tutoring school should choose different methods suitable for it due to its own particularity, and different performance appraisal methods have their own particularities and shortcomings. Music tutoring schools should choose the most suitable performance management method for the enterprise according to its own situation. Combined with the characteristics and needs of music tutoring schools, this article introduces the commonly used performance appraisal methods.

3.1. Management by Objectives. Management by objectives emerged in the United States in the mid-1950s. It is a management system formed on the basis of Taylor's scientific management and behavioral science theory (especially the participatory management). Management by objectives is to compare and evaluate actual work performance with expected goals, and it is a commonly used performance evaluation method. The performance evaluation method based on management by objectives can apply

the basic principles of planning, execution, inspection, and feedback actions of management by objectives to performance evaluation [15]. It can be correspondingly divided into four stages: performance target planning, performance guidance, performance inspection, and performance incentive. The performance appraisal method based on management by objectives can be described by a flow chart (Figure 4).

To be effective, management by objectives must ensure its clarity and certainty. If the goal changes frequently, it is not well planned, and it is easy for the business to get into chaos. The target plan is future oriented, and the future is full of uncertainties. This requires constant modification of the target according to the environment. Revising a target system takes a lot of time and effort. As a result, managers may have to stop midway through ongoing management by objectives.

3.2. Key Performance Indicator Method. Key performance indicators are the extraction and induction of the key success factors in the operation of an enterprise [16]. By analyzing, setting, sampling, and calculating the key parameters of the input and output of a process within an enterprise organization, and through the objective quantitative management indicators for measuring process performance, it is a tool for decomposing enterprise strategic goals into operational vision goals. It is a quantifiable or actionable index system for evaluating the performance of the examinee. Key performance indicators must be quantifiable or actionable. If these two points cannot be met, it cannot be called a key performance indicator. Enterprises are usually divided into three levels: enterprise, department, and position to establish different key indicators.

The method is straightforward and easy to control and manage. Employees follow KPI measurement standards and reward standards, which can play an incentive-oriented role. The combination of results and process indicators can comprehensively, objectively, and fairly reflect employee performance levels.

This method fails to provide a complete set of indicators framework system with guiding significance for operation. There is no necessary internal logical connection between the indicators. Usually indicators are mostly positioned on individual and departmental performance, ignoring the relationship with organizational strategy. In addition, unreasonable assessment standards and improper weight setting are also frequent operational problems in KPI design.

3.3. Balanced Scorecard. The balanced scorecard is a strategic management tool that implements an enterprise's strategy into feasible goals, measurable indicators, and target values [17]. It not only enables companies to effectively track financial goals, but also focuses on key business progress and develops intangible assets that are beneficial for future growth. It urges business leaders to define the development strategy of the business in a balanced way from four dimensions: finance, customers, internal processes, and learning and growth. The correlations and links between the

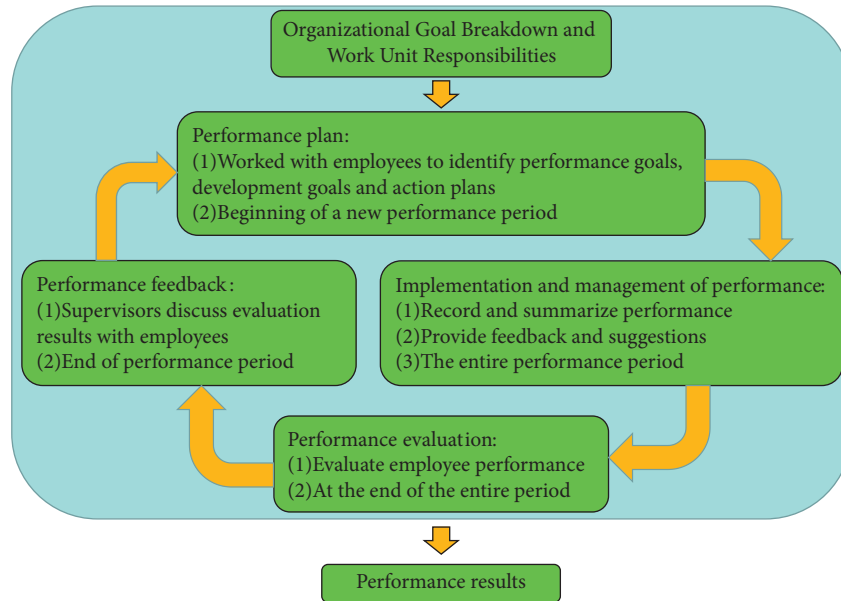


FIGURE 3: Performance management workflow.

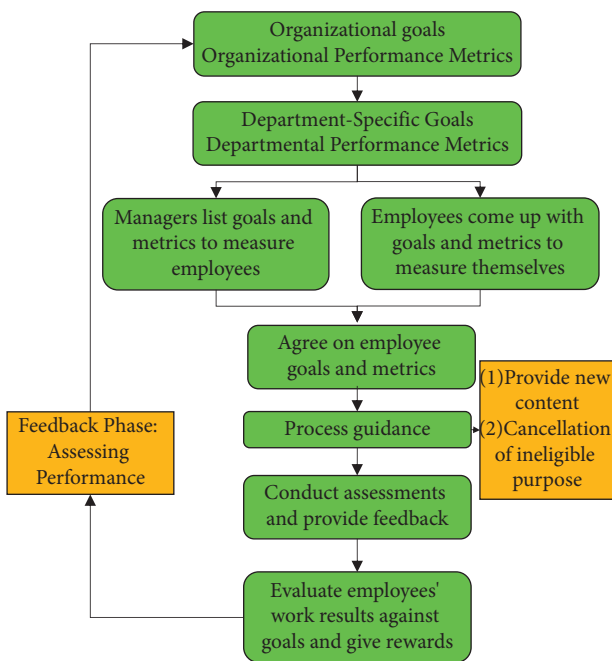


FIGURE 4: Flow chart of performance evaluation based on management by objectives.

four dimensions are analyzed according to the tracking and analysis of the target value result data, timely and early detection of problems, and adjustment of strategic goals and target values. A framework for implementing strategic objectives is established to identify management priorities. Therefore, the balanced scorecard overcomes the limitations of the traditional single financial indicator assessment, and also takes into account the three important aspects of customers, internal processes, and learning and growth. The enterprise can be observed from these dimensions, the enterprise strategy can be defined, and then the enterprise can achieve a comprehensive and balanced development.

The balanced scorecard is usually operated by comparing the budgeted and actual values of each indicator. Different scoring values are set by corresponding to the difference rates in different ranges. In the form of comprehensive scoring, the implementation of the objectives of each responsible department in the four dimensions is regularly assessed. Through timely feedback, the strategic deviation can be adjusted in a timely manner, or the original goals and evaluation indicators can be revised. It can ensure that the business strategy is implemented smoothly and correctly.

The top leaders of the enterprise can clearly grasp the status of each department and the overall operation of the enterprise through the balanced scorecard system. Through the formulation of performance appraisal indicators, it can be found whether the post setting of each department is reasonable and whether the workload is full. The use and operation of the balanced scorecard is very difficult. It is a lot of work. In addition to a deep understanding of strategic goals, it also takes a lot of time and energy to decompose it into various departments and positions, and to find appropriate indicators. The balanced scorecard does not apply to individuals. If the indicators of the four dimensions are decomposed to the individual level, it will take more time and increase the difficulty of assessment. For personal assessment, the assessment method is required to be easy to understand, operate, and manage, and the balanced scorecard does not have these characteristics.

3.4. Analytic Hierarchy Process. In the early 1970s, American operations researcher and University of Pittsburgh professor Satie first proposed the AHP. This method decomposes complex problems containing multiple factors into orderly and effective hierarchical components with less interrelatedness: target layer, criterion layer, and measure layer. Each component is quantified as a specific number or percentage by the assessor's assessment of the importance of each

component. It is necessary to determine and analyze the quantification value of the components of each level for the quantification value of the previous level and the composite quantification value of the final problem. The characteristic of AHP is the ingenious combination of qualitative analysis and quantitative calculation [18]. Through hierarchical, structured, and other analysis methods, complex problems are decomposed into specific elements and measured through digitalization. The method is scientific and systematic, the process is clear, easy to understand, concise, and practical.

Although AHP decomposes the final goal, the decomposed parts are less related. Each part can still affect each other and thus affect the final result. Therefore, it is necessary to carefully divide the components and clarify the possible impact of each component on the final problem. In determining the importance of each component, because the evaluator is a human, there is a certain subjective result rather than a very objective reality. At the same time, using this method requires a pairwise comparison, which requires a large amount of calculation. Too many indicators may result in failure to pass the consistency test results.

4. Music Counseling School Performance Evaluation Index System

4.1. Assess the Basic Process

4.1.1. Build a Performance Evaluation Index System. Constructing the performance evaluation index system is the basis of the whole performance evaluation based on the comprehensive evaluation method. The rationality of the construction of the indicator system is directly related to the correctness of the decision.

4.1.2. Analyzing the Properties of Indicators. The nature of the indicator directly determines the indicator weighting method and the comprehensive performance evaluation method to be used later. Quantitative indicators also need to be dimensionless to ensure the comparability of performance evaluation values of various music tutoring schools.

4.1.3. Indicator Empowerment. The weighting of indicators is to reflect the degree of influence of the importance of indicators on the performance evaluation value. For quantitative indicators, quantitative weighting methods can be used, such as principal component analysis method, direct weight method, and factor analysis method. For the index system that cannot be quantified, the experience of experts in the field can be combined, and some qualitative weighting methods, such as the AHP method, can be used for weighting.

4.1.4. Calculate the Combined Value of Performance Evaluation. The selection of the specific comprehensive evaluation mathematical model directly determines the rationality of the comprehensive evaluation value. In addition, the nature of the indicator system must be considered

in combination with the actual background. It is also possible to synthesize the comprehensive evaluation value of multiple methods to form a more objective comprehensive evaluation result.

4.2. AHP's Empowerment Approach

4.2.1. AHP Is a Commonly Used Index Weighting Method [19, 20]. It compares the importance of two indicators one by one, and uses a certain quantitative method to assign a certain weight to the indicators. Due to its good combination of quantitative methods and qualitative methods, it has been widely used in the past few years.

An event W has n components (w_1, w_1, \dots, w_n) , and the i -th component can be represented by w_i . And w_i/w_j represents the important multiple of the i -th part relative to the j -th part. If it is represented by a_{ij} , then $a_{ij} = w_i/w_j$, and the judgment matrix A can be obtained.

$$A = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{bmatrix}. \quad (1)$$

The steps of applying this method to determine the weight of each part inside the event are as follows. Subject ratings need to be broken down into different factors. According to the affiliation between the various factors, establish a hierarchical structure. The judgment matrix A is obtained by comparing the elements of the same layer pairwise. Quantitatively describe the relative importance of each layer, and use mathematical methods to find the largest eigenvalue λ_{\max} . The corresponding feature vector is the desired weight vector $W = (w_1, w_1 \dots w_n)$.

4.2.2. Basic Steps of AHP

(1) Create a hierarchical structure

Establishing a hierarchical hierarchy is the first step in the AHP. After in-depth analysis of the events to be studied, the influencing factors are divided into multiple levels. It includes the highest layer, the middle layer, and the lowest layer. The top layer is the target layer, which represents the decision-making goal that the decision maker wants to achieve. The middle layer is the criterion layer, which measures whether the goal is achieved or not. The lowest layer is the indicator layer, which represents the final judgment indicator. Taking the factors of the same level as the criterion for comparison and final evaluation, it dominates some factors of the next level, and at the same time it is subordinate to the factors of the previous level.

(2) Constructing judgment matrix

After the hierarchical structure model is established, the affiliation of the factors between the upper and lower layers is determined. On this basis, a judgment

needs to be made about the relative importance of each factor at each level. In order to quantify the judgments, the judgment matrix A is needed. Judgment matrix A represents a factor for the previous level. The relative importance of this layer and its related factors needs a pairwise comparison (as shown in Table 1).

(3) Calculate the weight vector

In order to extract useful information from the judgment matrix and realize the regularity of things, it is necessary to calculate the weight vector of each factor in the judgment matrix (as shown in Table 2).

Judging that the matrix A does not always satisfy the consistency, the method for finding the weight vector is as follows. By summing the elements of each row of A , equation (2) can be obtained.

$$\bar{w}_i = \sum_{j=1}^n a_{ij}, \quad i = 1, 2, \dots, n. \quad (2)$$

By further normalizing equation (2), equation (3) can be obtained.

$$w_i = \frac{\sum_{j=1}^n a_{ij}}{\sum_{k=1}^n \sum_{j=1}^n a_{kj}} \quad i = 1, 2, \dots, n. \quad (3)$$

Taking the geometric mean of the elements in each row of A , equation (4) can be obtained.

$$\bar{w}_i = \left(\prod_{j=1}^n a_{ij} \right)^{1/n}, \quad i = 1, 2, \dots, n. \quad (4)$$

By further normalizing equation (4), equation(5) can be obtained.

$$w_i = \frac{\left(\prod_{j=1}^n a_{ij} \right)^{1/n}}{\sum_{k=1}^n \left(\prod_{j=1}^n a_{kj} \right)^{1/n}}, \quad i = 1, 2, \dots, n. \quad (5)$$

The synthetic weight vector refers to the weight vector of the index layer in the index system to the target layer. The value of each component of it represents the proportion of the corresponding index in the total target layer. Single criterion sorting is to calculate the relative weights between elements under a certain criterion according to the judgment matrix, and the eigenvector method is usually used for calculation. Perron's theorem is the theoretical basis of the eigenvector method.

The details are as follows. A positive matrix when $A > 0$. All elements in matrix A are greater than zero. $\rho(A)$ is its spectral radius. The normalized eigenvector $w = (w_1, w_1, \dots, w_n)$ corresponding to the largest eigenvalue λ_{\max} of A is a positive vector. Let $A > 0$ and $x \in R$, equation (6) can be obtained.

$$\lim_{k \rightarrow \infty} \frac{A^k x}{x^T A^k x} = c v, \quad (6)$$

where v is the eigenvector corresponding to the largest eigenvalue of A . c is a constant.

TABLE 1: Definition of importance.

a_{ij}	Meaning
1	Equally important
3	One factor is slightly more important than the other
5	One factor is more important than the other
7	One factor is more important than the other
9	One factor is extremely important than the other
2, 4, 6, 8	Between the above two judgment values

TABLE 2: Secondary degree definition.

a_{ij}	Meaning
1/3	One factor is slightly less important than the other
1/5	One factor is less important than the other
1/7	One factor is much less important than the other
1/9	One factor is extremely secondary to the other
1/2, 1/4, 1/6, 1/8	Between the above two judgment values

Equation (7) can be obtained if $x = e$.

$$\lim_{k \rightarrow \infty} \frac{A^k e}{e^T A^k e} = z, \quad (7)$$

where z is the normalized vector corresponding to the largest eigenvalue of A .

4.2.3. *Consistency Check.* In the analysis of practical problems, due to the intricate complexity of objective things and the incompleteness of the subject's possession of data and the limitation of the ability to understand and understand, the understanding of things is inevitably subjective. It is difficult or even impossible for the judgment matrix thus constructed to fully satisfy the consistency requirements. Therefore, it is usually difficult to construct a matrix that fully satisfies the consistency, and the judgment matrix cannot completely deviate from the consistency conditions. Therefore, it is necessary to identify whether the judgment matrix is acceptable or not, which is the connotation of the consistency test.

4.3. *Fuzzy Comprehensive Evaluation Method.* Fuzzy comprehensive evaluation refers to finding a fuzzy weight vector $A = (a_1, a_2, \dots, a_n) \in F(V)$, and a fuzzy transformation f from U to V . Each factor u_i needs to be judged separately, $f(u_i) = (r_{i1}, r_{i2}, \dots, r_{im}) \in F(V)$, $i = 1, 2, \dots, m$. The fuzzy matrix can be constructed according to the above description.

$$R = [r_{ij}]_{m \times n} \in F(U \times V), \quad (8)$$

where r_i represents the degree to which the factor u_i has the comment v_j .

The mathematical model of fuzzy comprehensive evaluation involves the following three elements.

- (1) Element set $U = (u_1, u_2, \dots, u_n)$.
- (2) Comment set $V = (v_1, v_2, \dots, v_n)$.

- (3) One-factor fuzzy relationship $f:U \longrightarrow F(V)$, $u_i \longrightarrow f(u_i) = (r_{i1}, r_{i2}, \dots, r_{in}) \in F(V)$.

The fuzzy judgment matrix can be expressed as

$$R = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ r_{m1} & r_{m2} & \cdots & r_{mn} \end{bmatrix}. \quad (9)$$

For the fuzzy weight vector $A = (a_1, a_2, \dots, a_n)$ on the factor set U , it is transformed into a fuzzy set $B = A \cdot R$ on the decision set V through R .

The fuzzy comprehensive evaluation results of events are calculated according to the principle of maximum membership.

$$V = \max(b_i), \quad i = 1, 2, \dots, n, \quad (10)$$

where b_i is the possibility that the feature set belongs to the comment u_i .

The fuzzy comprehensive evaluation results of events are calculated according to the principle of minimum membership.

$$V = \min(b_i), \quad i = 1, 2, \dots, n, \quad (11)$$

where V is the corresponding comment is the comment of the event.

5. Empirical Analysis

5.1. Overview of Music Tutoring School. A music training school was established in 2007 with a registered capital of 800,000 yuan. The school adheres to the core concept of "learning the piano happily," and the mission of "popularizing elegant art." It integrates the resources of tutoring schools and primary and secondary schools, comprehensively introduces the American Happy Piano Teaching Curriculum System and Textbook System, and builds a brand new piano and other musical instrument learning platform. It has become a private music training school with professional high-quality professionals. The music tutoring school currently has four campuses with a total teaching area of more than 3000 square meters. It has a large dance classroom of 300 square meters, a beautiful environment, and strong teachers. All kinds of teaching facilities are complete. There are multiple professional courses in piano, digital piano, electronic organ, accordion, vocal music, dance, and music theory. The school's teaching performance is outstanding. The school has been awarded and praised by relevant departments such as the municipal education, culture, radio, and television bureau for many times.

5.2. Analysis of Problems Existing in School Performance Evaluation. Since the school was founded in 2007, with the joint efforts of the principal and school executives, the school has embarked on a fast track and expanded rapidly. It has attracted extensive attention from other schools in the same industry. However, rapid market expansion and

development requires comprehensive support from a scientific and sound management system. Since 2009, the management of schools has obviously lagged behind the rapid development of enterprises, and various problems have followed.

There are mainly the following problems.

- (1) In recent years, although some achievements have been made in the research on performance evaluation of various types of schools, there is still an incomplete understanding of performance evaluation. The problem is mainly reflected in the lack of in-depth understanding of performance. The school management still has not been able to realize the transformation from the "benefit" idea to the "performance" idea. In action, it is embodied in that when analyzing the performance of school organizations and individual employees, it only focuses on the analysis of output quality and quantity, or simply stays in the comparison of results and costs in teaching and enrollment management activities. It makes the "performance" evaluation a simple cost-benefit analysis of "benefit" and "effect." There is a lack of necessary research and evaluation on the efficiency, service quality, and process of education and teaching.
- (2) The problem also exists in the lack of awareness of the cost of performance evaluation. As a functional organization under the jurisdiction of the education bureau, music counseling school is responsible for cultivating high-quality talents for communities and enterprises. Under the guidance of this goal, the high-level and functional departments of the school often focus on the quality of enrollment management and teaching and research results.
- (3) There is no unified standard for the amount of admissions awards and preferential policies for freshmen registration for each campus, and there is no clear division of labor for each project department of the marketing department. Enrollment performance is not clear that there are often errors in individuals and bonuses, which will lead to some excellent marketers flowing into competitors in the same industry.

5.3. Design of Evaluation Index System. The determination of the weight of evaluation indicators is the key to school performance evaluation and an important way to improve the scientific nature of performance evaluation work. The setting of index weight mainly includes: AHP, expert experience method, etc. The analytic hierarchy process fully takes into account the different importance, influence, and priority of each indicator. The weight value of each evaluation index is calculated by the analytic hierarchy process, which can effectively avoid the subjectivity of determining the weight value of the index in the evaluation process.

The main financial indicators, management indicators, serving society indicators, learning and development indicators, and of school performance evaluation are as shown in Table 3.

Break the problem down into hierarchical levels. When applying the AHP method to analyze the problems of school performance evaluation, it is necessary to understand the factors that affect the school performance evaluation and determine the relationship between the factors. On this basis, a structural model of analytic hierarchy is constructed. It is necessary to construct a pairwise comparison judgment matrix. When the AHP method measures the relative importance of indicators, the proportional scaling method in Tables 1 and 2 is usually used to express the relative importance between any two indicators.

The following is an example of the first layer of indicators.

First, it is necessary to determine the importance of the first-level indicators of the four aspects of the balanced scorecard to the overall goal.

The music tutoring school has the nature of a nonprofit organization. Its main purpose is not to pursue the maximization of educational profits, but to focus on serving the society and meeting social needs in order to achieve the goal of improving organizational performance. Therefore, the level of serving the society should be promoted, with a larger weight value than the other three levels. The salary level and the business management level are the reinforcers and fundamental guarantees for the success of serving the society, but the business management level is slightly more important than the financial level for school performance. The learning and development level is the foundation. Therefore, the importance of these four levels of indicators is: service to society, business management, learning and development, and compensation. To sum up, combined with the above proportional scaling method, the results of the pairwise comparison and judgment of the first-level index layers are obtained, as shown in Table 4.

According to the judgment matrix, the relative weight of each factor in the above AHP is calculated, and the weight vector is obtained. There are many ways to calculate relative weights. The earliest proposed, the most widely used, and the most practical and important theoretical significance is the characteristic root method.

The judgment matrix A is

$$A = \begin{bmatrix} 1 & 1/2 & 1/5 & 1/3 \\ 2 & 1 & 2/5 & 2/3 \\ 5 & 5/2 & 1 & 5/3 \\ 3 & 3/2 & 3/5 & 1 \end{bmatrix}. \tag{12}$$

After normalizing matrix A by column, we can get matrix B .

$$B = \begin{bmatrix} 0.0909 & 0.0909 & 0.0909 & 0.0909 \\ 0.1818 & 0.1818 & 0.1818 & 0.1818 \\ 0.4545 & 0.4545 & 0.4545 & 0.4545 \\ 0.2727 & 0.2727 & 0.2727 & 0.2727 \end{bmatrix}. \tag{13}$$

After summing matrix B row by row, we can get matrix U .

$$U = \begin{bmatrix} 0.3636 \\ 0.7272 \\ 1.8181 \\ 1.0909 \end{bmatrix}. \tag{14}$$

After normalizing the matrix U , the matrix W can be obtained.

$$W = \begin{bmatrix} 0.0909 \\ 0.1818 \\ 0.4545 \\ 0.2727 \end{bmatrix}. \tag{15}$$

The process of calculating the maximum eigenroot of the judgment matrix is as follows.

$$A \cdot W = \begin{bmatrix} 1 & 1/2 & 1/5 & 1/3 \\ 2 & 1 & 2/5 & 2/3 \\ 5 & 5/2 & 1 & 5/3 \\ 3 & 3/2 & 3/5 & 1 \end{bmatrix} \begin{bmatrix} 0.0909 \\ 0.1818 \\ 0.4545 \\ 0.2727 \end{bmatrix} = \begin{bmatrix} 0.3636 \\ 0.7272 \\ 1.8181 \\ 1.0909 \end{bmatrix}. \tag{16}$$

The maximum eigenroot $\lambda_{\max} = 4$ can be obtained.

Consistency checks and weight determinations are required. Consistency test is performed on the weight vector, that is, the judgment matrix is required to generally satisfy the consistency. The steps of the consistency check are as follows. First, the consistency index CI is calculated. The larger the value of CI , the farther the judgment matrix is from complete consistency. $CI = (\lambda_{\max} - n)/(n - 1)$. The closer the CI value is to 0, the closer the judgment matrix is to complete consistency. The higher the order n of the judgment matrix, the greater the index CI of artificially deviating from complete consistency. The smaller the order n , the smaller the artificial deviation.

Second, one needs to find the corresponding average stochastic RI . Figure 5 shows the average random consistency index obtained by calculating 1000 times the judgment matrix of order 1–9.

Finally, the consistency ratio CR is calculated. When $CR < 0.1$, it is considered that the judgment matrix has satisfactory consistency and is acceptable. However, when $CR \geq 0.1$, the judgment matrix should be appropriately revised until the test conditions are met.

When $CI = 0$, look up Figure 5 to get $RI = 0.9$. When $CR = CI/RI = 0 < 0.1$, the judgment matrix has acceptable and satisfactory consistency. Therefore, the weights of the primary indicators can be determined as shown in Figure 6.

After the index system is tested and confirmed, the hierarchical structure model is basically completed. However, the credibility of the evaluation index weight is not naturally improved because of the reasonable index design

TABLE 3: Evaluation indicators.

Salary indicator (X)	Structural indicators (X1)	The proportion of school education expenses in school funds (X11) The proportion of enrollment management fees in school funds (X12) The proportion of scientific research expenses in school funds (X13)
	Incremental metrics (X2)	Growth rate of school education expenses per student (X21) Growth rate of enrollment management fee per student (X22) Growth rate of scientific research fees per student (X23)
	Level indicator (X3)	The per capita education cost of our school is compared with that of schools in the same industry (X31) Compared with the investment of similar foreign schools (X32) Compared with the investment of domestic similar schools (X33)
Use efficiency (Y1)	Human resource utilization (Y11)	Student-teacher ratio (Y111) Students as a percentage of the total faculty (Y112)
	Material resource utilization (Y12)	Utilization of special equipment for teaching and research (Y121) Average utilization of classrooms and laboratories (Y122) Book turnover (Y123)
	Financial allocation ratio (Y13)	Proportion of teaching and research funding (Y131) Proportion of administrative expenses (Y132) Proportion of enrollment management fee (Y133)
Management efficiency (Y2)		Funding rate (Y21) Earmarked rate (Y22)
		Calculate the execution deviation rate (Y23)
Social service indicators (Q)	Talent development (Q1)	Outstanding student ratio (Q11) Talent transfer ratio (Q12) Qualification ratio (Q13)
	Scientific research results (Q2)	Scientific research project acquisition rate (Q21) Serving the society scientific research achievements (Q22) The number of scientific papers published (Q23)
	Other service (Q3)	Provide consulting services (Q31) Assist with community training times (Q32) Number of trainees (Q33)
Learning and development (Z)	Talent construction (Z1)	Proportion of experts and professors (Z11) Excellent teaching and management staff ratio (Z12) Organizational training and education (Z13)
	Discipline construction (Z2)	Number of key disciplines (Z21) Number of excellent courses (Z22) Proportion of excellent courses (Z23)
	Information system construction (Z3)	Teaching information (Z31) Remote network construction (Z32) Information exchange and processing (Z33)

TABLE 4: Standard comparison judgment results.

Importance	X	Y	Q	Z
X	1	1/2	1/5	1/3
Y	2	1	2/5	2/3
Q	5	5/2	1	5/3
Z	3	3/2	3/5	1

and the use of the AHP method. The accuracy and consistency of the matrix are important influencing factors of the weight reliability. According to the AHP method and procedure, the weight of each level index to its upper level index can be determined in turn. Due to the limitation of space, the specific scale of each level and the calculation and testing process of establishing the judgment matrix are omitted. The comprehensive weight results of performance evaluation at each level are shown in Figure 7.

5.4. Analysis and Thinking of Calculation Results

5.4.1. *First Layers.* From the perspective of the four first-level indicators, the “serving society” indicator has the highest weight. It shows that the music tutoring school pays a high degree of attention to talent training, scientific research, and other services.

5.4.2. *Middle Layers.* Among the 11 secondary indicators, “use efficiency” and “talent development” have relatively high weights.

5.4.3. *Target Layer.* Among the 38 secondary indicators, “student-teacher ratio” and “proportion of government funding” have relatively high weights.

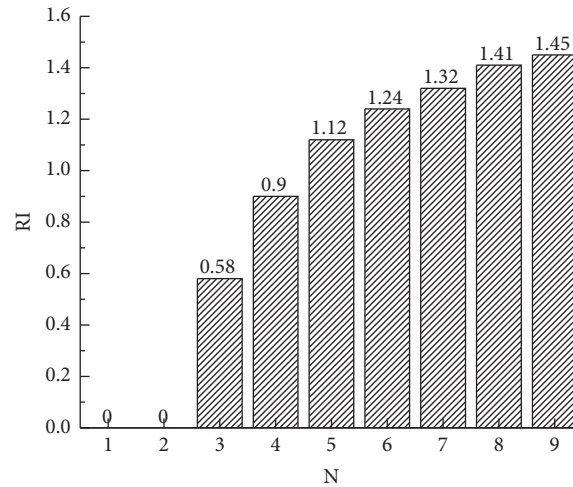


FIGURE 5: Average stochastic consistency indicator.

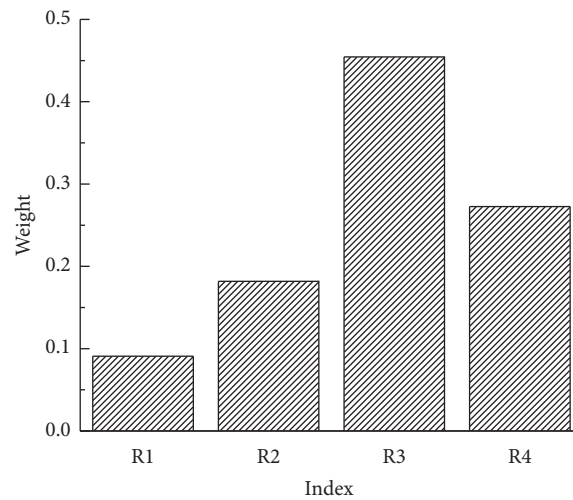


FIGURE 6: Weights of primary indicators.

6. The Management Method to Ensure the Performance Management System

6.1. *Improve the Hardware Facilities and Formulate the Management Mode of the System.* The relevant departments have not made clear regulations on the construction of hardware facilities of music tutoring schools, and the construction of hardware facilities is also different for each training institution due to its own economic conditions. As a result, the construction of hardware facilities in each training is not perfect and affects teaching. Therefore, relevant local departments should make strict requirements on the construction of hardware facilities of music tutoring schools. Music tutoring schools should also strengthen and improve the construction of hardware facilities and formulate management models suitable for their own development.

6.2. *Implement Diversified Publicity and Expand Enrollment Publicity.* The traditional mode of enrollment publicity is printing and distributing leaflets, word-of-mouth publicity,

etc. Although it plays a certain role in recruiting new students for music tutoring schools, other problems such as its small publicity scope and slow timeliness make it difficult to recruit students. It will cause some music tutoring schools to struggle. Therefore, music tutoring schools should implement diversified publicity methods by cooperating with schools to formulate literary and artistic programs, carry out campus and other related public welfare performances, and guide students in aesthetic education. By using major network platforms for publicity and by strengthening public opinion guidance and inviting relevant media to publicize music tutoring schools, the school expands the scope of enrollment and solves problems such as enrollment difficulties.

6.3. *Strengthen the Construction of Teaching Staff and Stabilize the Teaching Team.* Most of the teachers are college and undergraduate fresh graduates and some part-time teachers are undergraduates. Due to the inexperience of fresh graduate teachers in specific teaching, the fluidity and

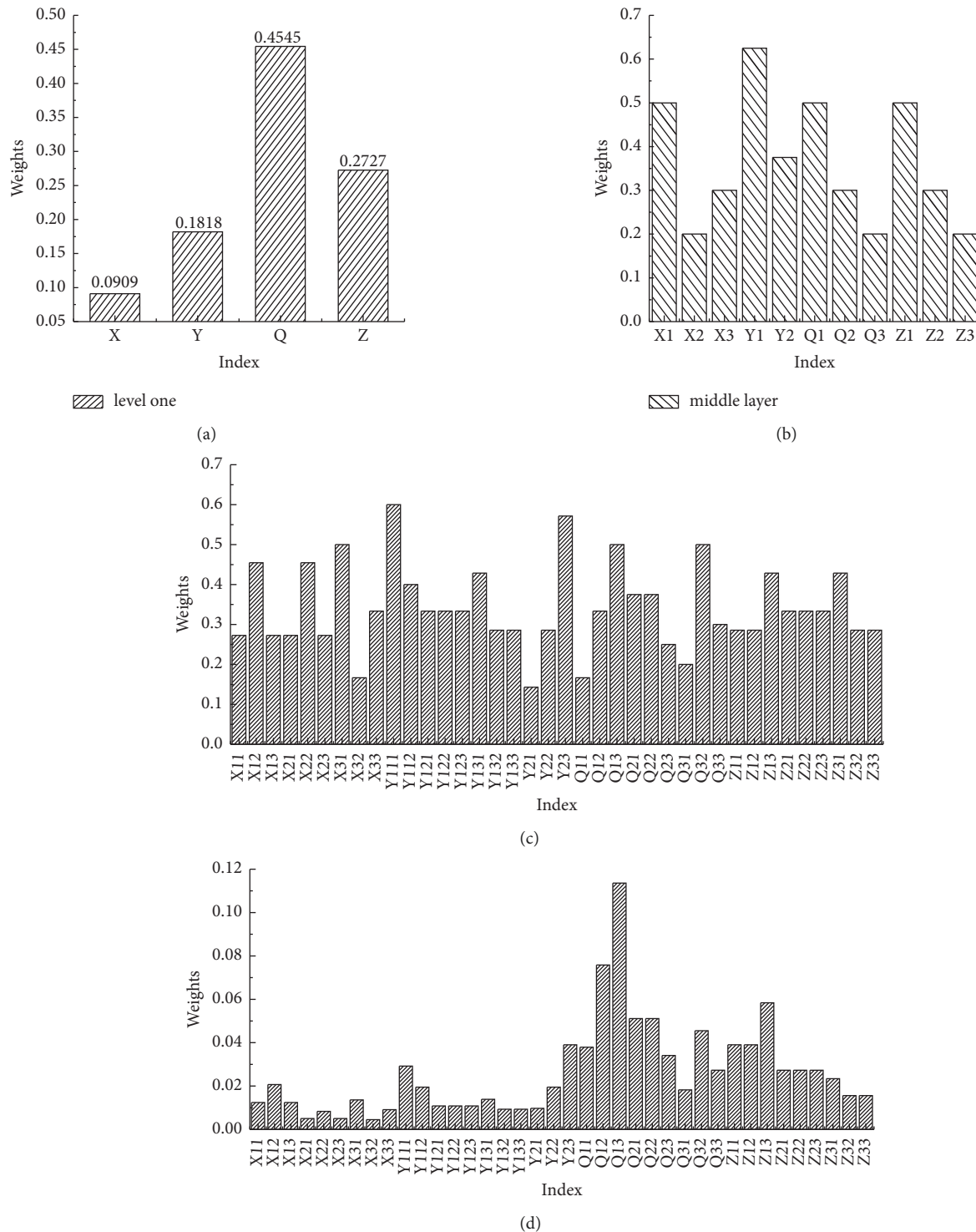


FIGURE 7: Weights of performance evaluation level indicators. (a) First layers. (b) Middle layers. (c) Target layer. (d) Comprehensive weight.

instability of part-time undergraduate teachers have a certain impact on the overall development of music tutoring schools. Therefore, schools should strengthen the construction of teaching staff. Regular professional training for teachers and regular teacher teaching competitions can be held to absorb the teaching methods of excellent teachers. At the same time, teachers should be assessed regularly to improve their teaching level.

6.4. *Regulate the Market of Training Institutions and Strengthen Management and Supervision.* Relevant local departments should strengthen management and raise the entry threshold. By formulating relevant supporting facilities standards and formulating unified price management standards, we will strictly combat unlicensed operations and arbitrary charges. It is also necessary to regulate the market of training institutions to better promote the development of children’s music training.

7. Conclusion

By evaluating the results of the school's performance management system, managers can judge the matching degree of the entire performance management system with the school's situation and development. It is necessary to emphasize the implementation effect, and continuously improve and perfect the problems and deficiencies in the performance management system. Taking this as the starting point of a new performance management work cycle, the performance management work can be continuously improved and perfected in the development of the school. The competitiveness of the training school has been comprehensively improved through the scientific and systematic performance management system. And in the process of implementation, it helps managers master relevant management skills, cultivate scientific management habits, and help employees improve work efficiency and develop their potential. In turn, it can help schools to effectively implement their strategic plans and goals.

On the basis of the established index system, through the use of the method of fuzzy comprehensive evaluation and the collection and processing of relevant statistical data, a comprehensive evaluation of the performance level of music tutoring schools is carried out. Through the analysis of the results of the evaluation, we found some problems in the development of music education and found out the decisive factors that affect the performance of music tutoring schools. This article puts forward specific measures on how to improve the performance management level of music tutoring schools.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

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