



Volume 2023, 18 pages
Article ID : JSMTL-2308212112857

Journal of Science, Management and Tourism Letter

<http://www.htpub.org/Journal-Of-Social,-Management-And-Tourism-Letter/>

ISSN: 2783-4239



Different approaches of performance evaluation methods of Chinese university teachers

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Article	Abstract
<p>Article history: Received: 18 August 2023 Received in revised form: 01 September 2023 Accepted: 02 September 2023</p> <p>Keywords: University teachers, Performance Evaluation, Fuzzy Analytic Hierarchy Process, China</p>	<p>As China's higher education begins to change from the original elite education to mass education, it is required to establish and improve the quality evaluation system and mechanism as soon as possible. How to comprehensively evaluate the performance of higher education teachers based on the implementation of effective incentives has become the focus of governance and institutional innovation in higher education nowadays. How to fully mobilize the human resources of higher education institutions to work actively and give full play to their creativity is an important issue related to the realization of the strategic objectives of the university. In order to solve this problem, it is necessary to establish a scientific and reasonable performance evaluation system for human resources in colleges and universities. The paper draws out a new performance evaluation method by analyzing four existing performance evaluation methods and discussing their advantages, disadvantages and peculiarities. The importance and practical application of the fuzzy analytic hierarchy process method show that it is more suitable for the performance evaluation of teachers in Chinese colleges and universities than the previous four methods.</p>

Introduction

With the rapid growth of government investment in Colleges and universities and the rapid expansion of the scale of colleges and universities, Chinese colleges and universities began to introduce performance evaluation. Practice shows that the implementation of performance evaluation in colleges and universities has played a positive role in improving the overall management level and school efficiency. In recent years, various forms and contents of performance evaluation have been carried out at different levels of colleges and universities. For example, university education quality assessment, discipline assessment, university ranking list, and various assessments carried out within universities to meet management needs. Performance evaluation focusing on assessment has become an important tool for Chinese government departments, colleges and universities and higher education research institutions to show the performance of government investment in higher education, demonstrate the ability of scientific and technological innovation, strengthen public communication and improve the management performance of colleges and universities. As a result, there are many reports and debates about the lack of major scientific and technological innovation capacity of universities, the existing

evaluation and management system is not conducive to innovation development, the lack of effective supervision and analysis of financial investment performance of universities, and the efficiency of resource sharing and allocation of universities (Zhao et al, 2015; Wang 2018).

At the same time, the reform of internal management system of Chinese colleges and universities has been deepening, and the optimization of internal organization structure and operation mechanism of colleges and universities, and the improvement of working efficiency have become the focus of college managers (Yu, 2017). Therefore, it is urgent to construct a basic framework of performance evaluation suitable for the development of universities in the new era based on systematic research, comparison and reference to the current internal evaluation system of universities at home and abroad. It has become one of the most important issues for higher education administrators and researchers to strengthen scientific decision-making, improve resource allocation efficiency, enhance innovation ability and improve management efficiency through performance management, and design practical implementation plans to achieve standardized, efficient and systematic university management.

In recent years, with the continuous development of Chinese education, universities have begun to study how to effectively improve their own education quality and teaching efficiency. How to realize university teaching with Chinese characteristics and achieve the connotative development of higher education is

inseparable from the improvement of teachers' soft power. How to improve teachers' soft power and better educate students, it is crucial to establish a suitable teacher performance evaluation system. At this stage, the competition among colleges and universities is showing an increasing trend, and how to make colleges and universities stand out in the competition has become the focus of more and more colleges and universities. Among the various factors that affect the teaching quality, the comprehensive quality plays the most important role (Yi, 2017). Although colleges and universities are a normal teaching institution, due to the increasing number of schools, colleges and universities are gradually developing towards the market direction. In order to solve these problems, it is necessary to establish a valid and reliable teacher performance appraisal mechanism in Colleges and universities, and give incentive mechanisms to some teachers who perform actively, so as to provide strong support for their evaluation and even their promotion of professional titles.

Due to the late start of teacher performance evaluation in Chinese universities, many universities still use the performance evaluation methods of enterprise employees. Because of the particularity of college teachers' work and the characteristics of knowledge workers, the current performance evaluation methods cannot accurately evaluate college teachers. In the following, this paper will discuss the current mainstream methods, their advantages and disadvantages, and at the end of the discussion a new and more accurate performance evaluation method will be proposed.

Previous Methods

This paper will discuss four main exists methods used in performance evaluation.

360 Degree Feedback

360 degree feedback evaluation method, is also known as "all-round evaluation method", and it was first proposed and implemented by Intel (Kai, 2012). It refers to the understanding of individual performance from the perspectives of employees, superiors, direct subordinates, colleagues and even customers (see Figure 1). As a new management evaluation method, 360 feedback evaluation has a good

prospect of sustainable development, but at the same time, it also has some problems to be studied and improved.

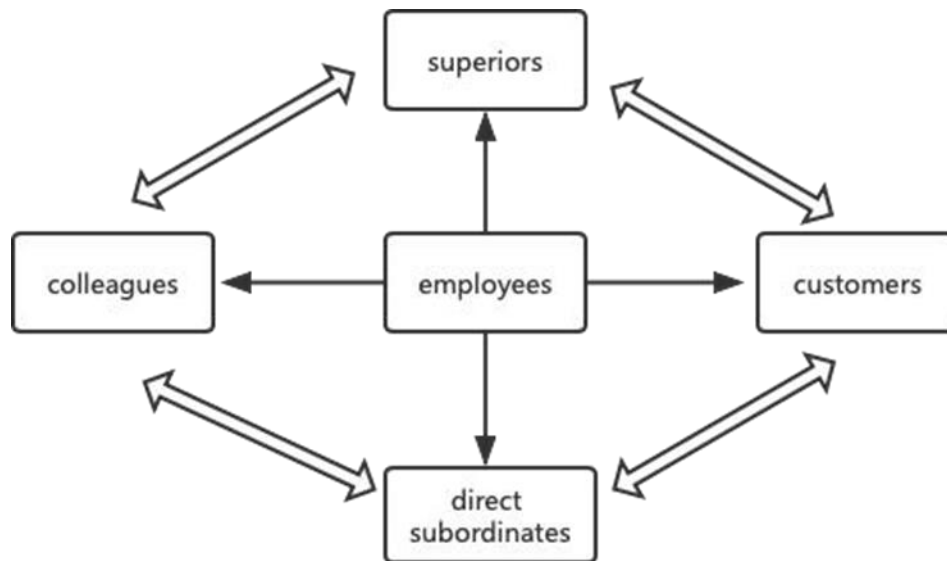


Figure 1: 360 feedback (Zhang, 2016)

Theoretical assumptions of 360 feedback performance evaluation

Some foreign researchers believed that 360 degree feedback is based on two simple assumptions: one is derived from measurement theory. For an individual, observations from multiple perspectives will lead to more effective and reliable results (and more meaningful and useful); Second, the change of behavior and concept runs through the process of enhancing self-awareness. 360 degree feedback is like a "mirror", from which the evaluated person can find himself and adjust himself (Chandhana and Easow, 2015).

The implementation process of 360 feedback

David Antonioni deeply analyzed how to design an effective 360 degree performance evaluation system from the perspective of input, process and output (Antonioni, 1996). Li Pei believed that the implementation of 360 degree performance evaluation includes three stages: design stage, implementation stage and evaluation stage (Li, 2016). Similarly, Li Haibing also believed that the 360 degree performance evaluation method should be divided into three stages: process design, process implementation and process evaluation (Li, 2016). Although they are divided into three stages, they have different views on what should be done in the third stage. The former thinks that the third stage is the most important stage in the 360 degree performance evaluation and the longest lasting stage, because at this stage, as the

design team of the 360 degree performance evaluation method and the coordinator of the project, we must constantly evaluate the implementation process of feedback according to the actual situation, and adjust the personal development plan of the appraisee accordingly; The latter believes that the main work of the third stage is to analyze the safeguard measures and conduct user evaluation, evaluate the reliability of the project and analyze the user satisfaction to optimize the whole evaluation process.

The advantages of 360 feedback

Many Chinese scholars have analyzed the advantages of 360 feedback evaluation from the perspective of organization members as follows:

Fairness and justice (Sun, 2017). First of all, 360 degree performance evaluation method can make up for the abuse of power and strong subjectivity that may occur when direct managers evaluate their subordinates only; Secondly, the

omni-directional and multi angle evaluation also makes more information available, which makes it easy for all kinds of evaluators to complement each other's advantages, and makes the evaluation results fair, true and comprehensive; Moreover, the

weighted average algorithm reduces the influence of individual subjective factors, and can obtain higher and more reliable data fitting to employees' own characteristics.

Strengthen communication within and between departments (Jiang, 2016). Through self-evaluation and mutual evaluation within and among departments, 360 degree performance evaluation promotes mutual understanding among employees in the whole enterprise, enables employees to consider problems from the perspective of each other in their future work, resolves contradictions, cooperates with each other, and strengthens communication between departments. Constantly implementing 360 degree performance evaluation and strengthening the feedback of evaluation results will help to make the corporate culture more participatory, improve mutual trust, and strengthen team building.

Enhance the self-management ability of employees and promote their personal development (Li, 2016). The 360 degree performance evaluation method is to evaluate the appraisee through multiple channels such as the superior, the colleagues, the subordinate and the customer of the appraisee. Through this evaluation method, the appraisee can objectively understand their strengths and weaknesses, help employees correct their shortcomings, realize self-performance management, and encourage them to develop their working ability more effectively and win more development opportunities. In addition, in the result feedback of 360 degree

performance evaluation, there are specific personal development plans and guidance. These advisory opinions and suggestions can improve the career planning of the appraisees and promote their personal development.

It is conducive to the work of the personnel department. The more objective and fair evaluation results obtained by this method make it easier for the personnel department to recognize and implement the reward and punishment measures based on it.

The advantage of 360 degree performance evaluation method also lies in the individualization of evaluation standards. The traditional performance evaluation often sets the same evaluation standards for the same kind of appraisal objects or even all the appraisees. The implementation of a perfect and reasonable 360 degree evaluation, the design of different evaluation indicators for different posts, different evaluation indicators are evaluated by different evaluation subjects, and different weights of each evaluation subject are allocated according to different posts. This personalized evaluation standard will make the performance evaluation of enterprises more targeted and more objective and fair.

The disadvantages of 360 feedback

In some enterprises, when implementing the 360-degree performance appraisal, the various types of evaluators of the appraisee are mainly nominated by the appraisee himself, which is not fair. This determination of the evaluator's appraisal results is very easy to appraisal bias. This is because evaluators are not selected on the basis of fairness, but only on the basis of whether the appraisee agrees. Lack of breadth and representativeness in the constituency of evaluators, as well as the fact that some evaluators have relatively good personal relationships with the appraisee. (Gao, 2017).

Since 360 degree performance evaluation focuses on the comprehensive appraisal of the appraisee in all aspects, with a large proportion of qualitative evaluation and less quantitative performance evaluation, 360 degree performance evaluation can be combined with performance indicator appraisal to make the evaluation more comprehensive.

Understanding appraisal scores and information coming from different sources is also sometimes not easy as the results from these sources are not always consistent. For example, the communication ability of the same employee is rated as excellent by the superior, medium by the subordinate and poor by the customer, which brings trouble to the overall evaluation of the employee.

Difficult to process information. The 360 degree performance appraisal method involves much more data and information than the single channel appraisal method. This advantage is a problem in itself, because the cost of collecting and processing data is very high. At the same time, because there is a large amount of information to be collected, this method tends to become mechanical and pursue written materials, that is, from the direct communication between the two people to the communication between tables and printed materials.

During the implementation of 360 degree performance appraisal, improper training and application may cause tension in the organization and affect the work morale of organization members. Moreover, it is easy to encounter some pitfalls when implementing 360 degree performance appraisal, such as cultural shock, arbitrariness, loss of loyalty of organization members, failure of supervision, nepotism, etc.

Key Performance Indicators

Key performance indicators (KPI) is a management technology proposed by D.Ronald.Daniel in 1980s (Wen and Guo, 2020) to measure organization objectives. It refers to the method to refine and decompose the organization strategic objectives, extract the key success factors that are conducive to the implementation of the enterprise strategy, and then identify the key performance indicators that play a decisive role in the key success factors, so as to promote the realization of the enterprise strategic objectives. KPI is a key index system, which can be used to measure the implementation effect of organizational strategy. Its purpose is to establish a mechanism to transform the organizational strategy into internal processes and activities, so as to promote the organization to obtain sustainable competitive advantage (Fang and Chen, 2017).

Theoretical assumptions of KPI

It is widely recognized at home and abroad that the SMART principle should be followed in determining KPIs(Wang et al., 2018). Where S stands for "special", which means that the objectives should be detailed when designing key performance indicators; M stands for "measurable", which means that the objective can be quantified; A stands for "attainable", which means that employees can achieve their goals through efforts; R stands for "relevant", which means that the key performance

indicators are related to the objectives and work business; T stands for "time bound", which means that there is a specific time limit for the completion of indicators. Rao Zheng and Sun Bo (Rao and Sun, 2016) pointed out that it is generally necessary to use the "fishbone diagram" (Figure 2.2) to set the KPI indicators. The main content is to extract the key success factors and business of the enterprise through the way similar to the fishbone diagram, and clarify the methods to meet the key business needs. So as to decompose the key performance indicators and obtain the key factors that support and meet the strategic objectives of the enterprise.

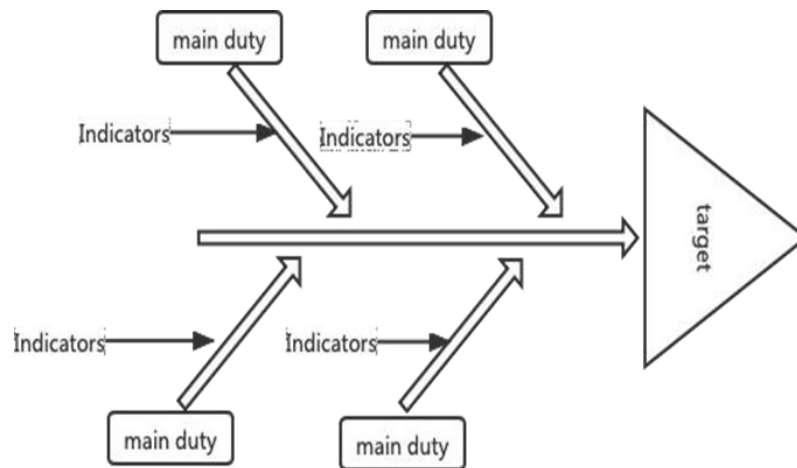


Figure 2: Fishbone Diagram of KPI (Rao and Sun, 2016)

The implementation process of KPI

Key performance indicators can be divided into quantitative indicators and qualitative indicators in terms of type, and can be divided into enterprise level primary indicators, department level secondary indicators and position level tertiary indicators in terms of rank. There are generally four design dimensions of key performance indicators, it called Grey Port quartile method, including quantity dimension, quality dimension, cost dimension and effectiveness dimension. While the setting steps of key performance indicators can be divided into three steps. The first step is to extract the corresponding indicators in combination with the development strategy and objectives of the enterprise organization, job analysis and internal processes of the organization. The second step is to select the appropriate key performance indicators according to the "Pareto principles" (Brynjolfsson et al., 2011). The third step is to review the reliability and validity of the selected indicators to ensure that the indicators can accurately and reasonably reflect the performance of the appraisees. Setting key performance indicators reasonably can decompose the overall enterprise

goal strategy into each business unit team, become the specific goal that each business unit or team is responsible for, transform abstract strategic actions into specific enterprise internal behaviors, and continuously improve the comprehensive ability of the enterprise.

The advantages of KPI

Many scholars have analyzed the advantages of KPI from the perspective of organization members as follows:

The key performance indicator method has clear objectives (Marr, 2012). Through the decomposition of the enterprise's strategic objectives, the employee's performance behavior is highly consistent with the enterprise's objectives, ensuring that there is no deviation on the way to achieve the

company's strategic objectives, and realizing the harmonious and win-win situation between individuals and enterprises.

Finding a few key indicators can reduce the energy and cost output in the assessment process, reduce the constraints on employees, and help employees find key breakthroughs in heavy work tasks (Peng et al., 2012).

Key performance indicators help managers communicate smoothly with employees, so that employees can timely grasp the deficiencies and problems in their work, and take timely improvement measures to promote the formation of a good cultural atmosphere of sustainable progress and development (Ji and Li, 2011).

Since the operation results of an enterprise organization are generated by the internal factors and external environmental factors, and the internal factors are more key controllable factors, when determining the selection of key performance indicators, we can try to avoid the influence of external factors and focus on the controllable areas within the scope of work responsibilities (Ahmad, 2017).

The establishment of key performance indicators are determined by the members at all levels of the organization through consultation, not by the executive force of the top management or by the organization members themselves. When determining KPI indicators, the organization members should reach a consensus through face-to-face communication and negotiation, reflecting the common will of the managers and organization members (Maute, 2009).

The disadvantages of KPI

There are also some limitations of KPI commented by some scholars as follows:

The key performance indicator method has high requirements for quantification, and it also needs to accurately grasp the direction of indicators. For indicators that cannot be quantified, it needs to be used in combination with other qualitative performance management methods. At the same time, failure to correctly grasp the key indicators is likely to cause management failure (Rahardja et al., 2012);

Second, the key performance indicator method pays too much attention to the assessment indicators, and focuses on the results, which is easy to produce unfair phenomena and reduce the credibility of performance management (Tuic et al, 2021).

Balanced Score Card

The Balanced Score Card (BSC) is a performance evaluation method carefully designed based on the requirements of the organization's mission, vision and strategy. It plays a huge role in the field of enterprise strategic management and organizational performance evaluation. It is rated as one of the most influential management tools in the past 75 years by the Harvard Business review (Park et al, 2017). Its founders, Robert Kaplan and David Norton defined it as (Kaplan and David, 2009): the balanced scorecard is a performance management tool, which decomposes the enterprise strategic objectives layer by layer into various specific and mutually balanced performance appraisal indicator systems, and evaluates the realization of these indicators in different periods of time, so as to establish a reliable implementation foundation for the completion of the enterprise strategic objectives. The BSC helps organizations overcome the two basic problems of effectively evaluating organizational performance and successfully implementing strategies (Rawnaq and Kaddumi, 2020).

Theoretical assumptions of BSC

The BSC approach combines financial and non-financial measures. Financial measures show the results of actions taken, rather than financial measures focusing on internal processes, customer satisfaction and innovation and improvement. This approach looks at the organization from four different perspectives, namely finance,

customers, learning and growth, and internal processes (Raval and Kant, 2019). From the financial point of view, its goal is to solve the problem of "how shareholders view managers" from the starting point of "shareholders' interests", which is used to describe the facts that have occurred, similar to the traditional measurement and assessment; From the perspective of customers, it judges the external service level of the enterprise based on the demand of customer first and related issues such as "how consumers view and understand the company"; From the perspective of internal process, it is used to solve how to improve process efficiency and work efficiency by taking "the organization is good at something" as the starting point. It focuses on the decisions, processes and actions that affect the overall benefits of the organization, with particular emphasis on the operation process of shareholder satisfaction and customer satisfaction; From the dimension of learning and growth, it is to extend attention to the future success of the organization, pay attention to the learning and growth, potential development, ability improvement, quality improvement and other issues of organization members, and re-attribute the fundamental factor of organizational development to the power of "people". (See Figure: 3)

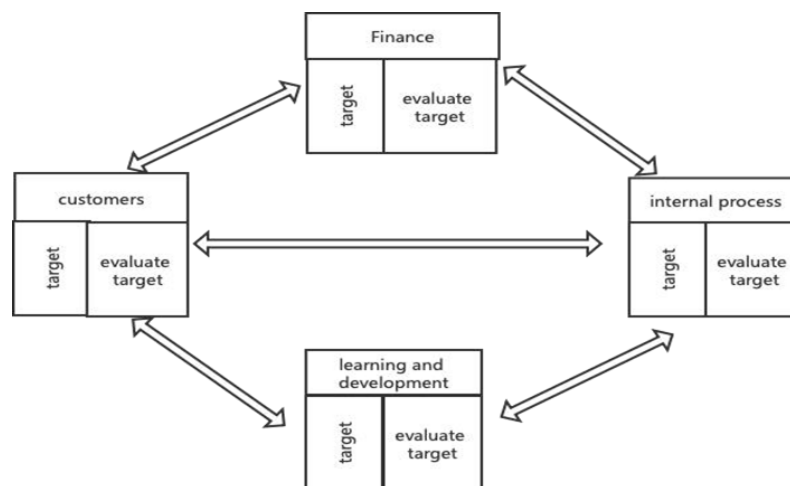


Figure: 3: The construction of BSC(Jun-Nan,2017)

The implementation process of BSC

Paul R.Niven described in the specific steps of implementing the balanced scorecard that the implementation of the Balanced Scorecard mainly follows seven steps (Paul, 2002). First, establish a strategic management organization; second, Reaching agreement on objectives and strategies of enterprise; Third, develop a strategic map, decompose strategic objectives from the four dimensions of finance,

customers, internal operation, learning and growth, and form key performance indicators; Fourth, strengthen the training, strengthen the communication between managers and employees, and make the strategic objectives of the enterprise deeply rooted in the hearts of the people; Fifth, quantifying performance indicators in different periods and linking them to the financial system; Sixth, the BSC is connected to the salary, personnel and other aspects of the enterprise; Seventh, timely communicate feedback, summarize and analyze, constantly revise the measurement indicators of the BSC, and promote the realization of the company's strategic objectives.

The advantages of BSC

There are some benefits from the studied of many scholars as follows:

The strategic objectives of the enterprise are reflected in key indicators that are easy to measure, which is the unique measurable advantage of the BSC (Pesalj et al., 2018);

The BSC can help employees at all levels to understand the strategic objectives of the enterprise and promote employees to play a key role (Chowdary, 2017);

The BSC uses four dimensions to reflect the key factors of the enterprise, and improves the management efficiency of the enterprise through the correlation between them.

On the basis of the traditional performance management method, the BSC fully considers the implementation of the enterprise strategy. It has the main characteristics of taking the company strategy as the guidance, ensuring the realization of the strategic objectives, conducting comprehensive evaluation and management of the enterprise, and facilitating the communication between the manager and the managed.

Once in place, the BSC can be used in many ways. As a performance management system, it supports the goal setting process and provides continuous information on key performance dimension (Namibia, 2015).

The disadvantages of BSC

Although the BSC have many advantages in the performance evaluation, it also has some limits as follow:

The implementation of the BSC is highly professional and has a large workload. The premise for its application requires that the enterprise has reached an agreed strategic goal, and the management has the ability and willingness to decompose the strategic goal (Ridwan and Sudirman, 2021);

The BSC is difficult to quantify abstract non-financial indicators, such as customer satisfaction, employee satisfaction, etc;

The BSC has a long display cycle and high implementation cost. It needs to formulate detailed goals and indicators for the four dimensions, which is easy to consume a lot of energy and time. In addition, it needs a certain time to adjust the structure and constantly standardize (Baiden et al., 2016).

Management by Objectives

Management by objectives (MBO) is the idea of "management by objectives and self-control" first put forward by Peter Drucker, a management master, in his book "management practice" in 1954, and created the concept of "management by objectives". He has an accurate interpretation of "the so-called management by objectives is the management of objectives and the management based on objectives" (Drucker, 2006). The theory of MBO is developed on the basis of summarizing the previous theories. On the ideological basis, it is similar to Y theory, that is, they all believe that people are active and can actively carry out self-control and management under a clear goal. In terms of content, they all take clarifying objectives, participating in decision-making, setting deadlines and feedback performance as basic elements. The birth and development of the theory of MBO coincided with the third industrial

revolution. Its strong result oriented role was recognized and widely welcomed as soon as it was applied, and quickly became popular in the United States, Western Europe and Japan.

Theoretical assumptions of MBO

The MBO allows employees to personally participate in the process of formulating organizational work objectives. It is a goal jointly determined by

superiors and subordinates, so employees can get more objective and reasonable evaluation and reward. It pays attention to the interaction between the upper and lower levels, closely combines personal interests with organizational interests, and promotes the exchange of views and mutual understanding. It is a communication process that better encourages employees to strive to achieve work goals in order to achieve organizational goals, focusing on the "self-control" of employees. To sum up, we can see the main characteristics of MBO: first, MBO is a way to participate in management. The second is to emphasize "self-control". Third, emphasize results first. Fourth, a kind of behavior of decentralized management (Cardona and Rey, 2022).

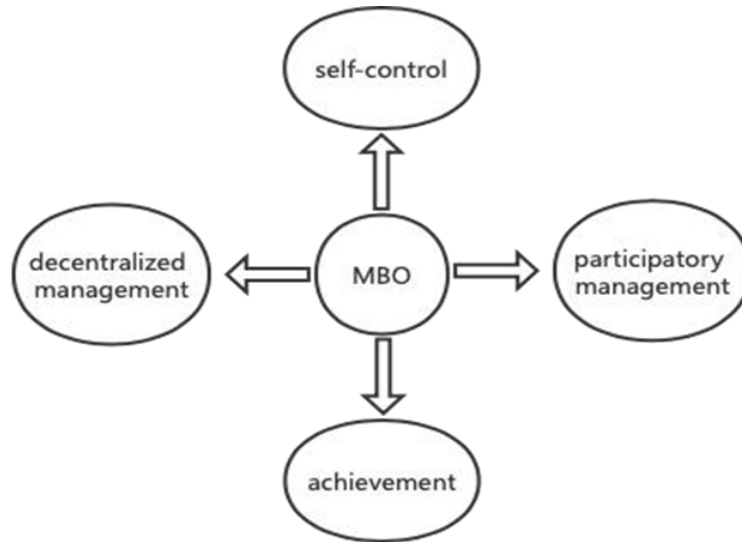


Figure 4: Main characteristics of MBO (Xu, 2020)

The implementation process of MBO

In order to achieve the goal, MBO also cultivates the participants' personal working ability and quality, emphasizing both "objective" and "unity". Therefore, there are three main steps in the implementation of objective management (Zhao and Gudamu, 2021):

Superiors and subordinates formulate and decompose objectives (FDO). The organization sets the overall objectives for a certain period of time according to the strategic planning of the enterprise, and then refines the objectives, from individual to department, from atomization to unitization, and then to gradually achieve the objectives.

Objective implementation process management (OIPM). After the objectives are established, the specific person or department in charge of each objective needs to develop an "exclusive" plan, and through full communication, timely feedback the results, optimize the process and exchange suggestions.

Results evaluation (RE). When the project or goal practice period is over, the achievement of the goal shall be inspected in time. Conduct performance evaluation through the reward and punishment mechanism. At the same time, summarize and evaluate the results, feed back and communicate, and prepare for the next cycle of work.

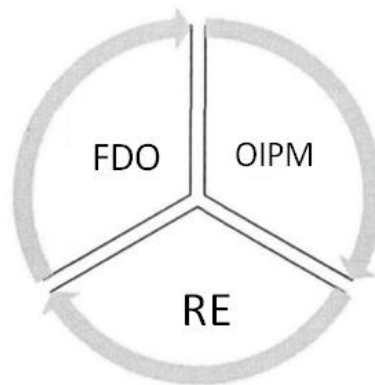


Figure 5: Implementation process (Xu, 2020)

The advantages of MBO

From the previous studies, we have known some benefits of using MBO to do the performance evaluation are as follows:

The indicators set by MBO are open and transparent, which helps employees understand their own situation and has an immediate effect on the objective management of responsibilities and tasks (Wu, 2017);

MBO pays attention to employee participation, encourages employees to contribute to the realization of organizational goals, and helps to improve employees' sense of responsibility;

MBO helps to improve the organizational structure. A position or department divided by the results of organizational objectives and responsibility is easy to find problems such as insufficient authorization and unclear responsibilities;

Management by objectives emphasizes self-control and self-regulation, and closely links personal interests with organizational interests, thus improving morale (Zhang, 2018);

Management by objectives promotes the exchange of views and mutual understanding, and improves interpersonal relations.

The disadvantages of MBO

The MBO not only have the above advantages but also have some barriers in the practice as follows:

Goals are difficult to set. Many goals within the organization are difficult to quantify and materialize; Many team work is technically indecomposable; There are more and more variable factors in the organizational environment, changing faster and faster, and the internal activities of the organization are becoming more and more complex, which makes the uncertainty of organizational activities more and more great. All these make it difficult for organizations to set quantitative targets for many activities(Okolocha, 2020).

Goal setting may increase management costs. It takes a lot of time to agree on goals, communicate and unify ideas; Every unit and individual pays attention to the completion of their own goals, and may neglect the mutual cooperation and the realization of organizational goals, and develop departmentalism, temporary views and the tendency to be eager for quick success and instant benefit (Vasile and Croitoru, 2018).

In practical work, rewards and punishments may not always be compatible with the objective results, and it is difficult to ensure impartiality, which weakens the effect of objective management (Rossi and Warglien, 2008).

Summary of four methods

Table 1 shows the summary of these four methods that contains the advantages, disadvantages and uniqueness.

Table 1 Summary of four methods

Table 1: Summary of four existing methods			
Methods	Advantages	Disadvantages	Uniqueness
360 Degree Feedback	<ol style="list-style-type: none"> 1. Fairness and justice 2. Strengthen communication 3. Enhance the self-management ability 4. Benefit the personal development 5. Individualization of evaluation standards 	<ol style="list-style-type: none"> 1. Evaluators are mainly nominated by appraisee 2. Large proportion of qualitative 3. Scores are not consistent 4. Difficult to process information 5. To cause tension and affect the work moral 	It refers to the understanding of individual performance from the perspectives of employees, superiors, direct subordinates, colleagues and even customers
Key Performance Indicators	<ol style="list-style-type: none"> 1. Clear objectives 2. Reduce the energy and cost output 3. Smooth communication 4. Avoid the influence of external factors 5. Indicators are determined by the all level members 	<ol style="list-style-type: none"> 1. High requirements for quantification and accurately grasp the direction of indicators 2. Pays too much attention to the assessment indicators and focuses on the results 	It refers to the method to refine and decompose the organization strategic objectives, extract the key success factors that are conducive to the implementation of the enterprise strategy, and then identify the key performance indicators that play a decisive role in the key success factors, so as to promote the realization of the enterprise strategic objectives
Balanced Score Card	<ol style="list-style-type: none"> 1. The strategic objectives of the enterprise are reflected in easily measurable key indicators 2. Help employees at all levels understand the strategic goals of the organization 3. Four dimensions to select the key factors 4. Full consideration of the implementation of the corporate strategy 5. Support the goal-setting process and provide ongoing information 	<ol style="list-style-type: none"> 1. Highly specialized implementation and workload 2. Non-financial indicators are difficult to quantify 3. Long display cycle and high implementation cost 	It decomposes the enterprise strategic objectives layer by layer into various specific and mutually balanced performance appraisal indicator systems, and evaluates the realization of these indicators in different periods of time, so as to establish a reliable implementation foundation for the completion of the enterprise strategic objectives
Management by Objectives	<ol style="list-style-type: none"> 1. Indicators are open and transparent 2. Focus on Employee Engagement 3. Improvement of organizational structure 4. Emphasis on self-control and self-regulation 5. Promoting exchange of views and mutual understanding 	<ol style="list-style-type: none"> 1. Goals are difficult to set 2. Goal setting may increase management costs 3. Difficulty in ensuring fairness in reward and punishment 	It pays attention to the interaction between the upper and lower levels, closely combines personal interests with organizational interests, and promotes the exchange of views and mutual understanding. It is a communication process that better encourages employees to strive to achieve work goals in order to achieve organizational goals, focusing on the "self-interest" of employees

Fuzzy Analytic Hierarchy Process

For a long time, the performance evaluation method of Chinese colleges and universities has been carried out in a more traditional way. At this stage, there are certain problems in the performance evaluation and assessment, which affect the development process of Chinese colleges and universities,

and have a serious impact on the quality of running schools and teaching in colleges and universities. Therefore, the reform of teaching performance evaluation in Colleges and universities is needed (Zhang, 2015).

Thus, based on the previous discussion on the exists performance evaluation methods, there is still lack of improved performance evaluation mechanism for teachers. In this paper, a new approach is introduced.

Fuzzy analytic hierarchy process (FAHP) was proposed by Saaty (Saaty, 1985), an American scholar. It uses a combination of qualitative analysis and quantitative analysis for comprehensive judgment. It has more in-depth and perfect conclusions for quantitative index judgment, and can put forward more detailed conclusions for relevant research, which has been widely used in all aspects of society. In the process of analysis, a diversified and multi-level analysis method is established, and each influencing element in the analysis object is compared one by one to ensure the accuracy of the analysis results (Wang and Chin, 2011). The establishment of the analysis matrix can accurately understand the relationship between the various elements, and accurately judge the correlation according to the relationship between the upper and lower stages. Combining quantitative analysis with qualitative analysis, the relevance of various elements in the object is calculated and sorted according to the relevance, which provides a reference for the final research results.

The importance of applying FAHP in university performance evaluation

At present, many colleges and universities in China have realized the importance of performance evaluation, established and improved the relevant mechanism of performance evaluation within the school, carried out scientific and reasonable performance evaluation, and promoted the effective improvement of the quality of running colleges and universities. Performance evaluation in colleges and universities has its own complexity and diversity, involving many factors, and it is difficult to effectively integrate and judge the factors. For example, students' curriculum arrangement, teachers' teaching files and lesson preparation materials, students' satisfaction with teachers' teaching, students' participation in learning activities, etc.,

the use of FAHP can timely and effectively evaluate relevant factors to a certain extent, it can enhance the communication between students and teachers, improve the quality of running a university, and promote the training mechanism of colleges and universities for high-quality talents (Wang, 2017). For the work of university teachers, the main task is to adjust the relationship between teaching and learning of various disciplines, effectively improve the communication status between teachers and students and school leaders, and promote students' effective learning and improvement. To a certain extent, teachers can effectively improve their own teaching methods and teaching level (Ma, 2022). A good evaluation mechanism can promote students' learning enthusiasm, guide students to arrange their own learning and practice more reasonably, and then promote the smooth implementation of teaching evaluation.

The Application of FAHP in Teachers Performance evaluation

Refine the work content of colleges and universities and improve the pertinence of performance evaluation For the formulation of performance management and evaluation mechanism in Colleges and

universities, we should constantly enrich its content, improve the comprehensiveness and accuracy of performance evaluation, constantly expand the content of performance evaluation, and formulate reasonable and effective evaluation standards for each relevant factor, which can clarify the work functions of staff, establish a rigorous power and responsibility distribution system, reduce the blind spot of staff work content, improve the pertinence of performance evaluation, and promote the improvement of school running quality (Shi and Han, 2011).

Clarify the distribution of power and responsibility of the teaching team and refine the performance evaluation strategy. The application of FAHP to performance evaluation requires teachers to establish different post responsibilities according to the differences between their teaching contents, so as to realize the effective evaluation of different disciplines, different development directions and different work contents, and reduce the imbalance of teaching evaluation caused by the differences between disciplines. The workload of teacher performance evaluation is relatively large, and the work content is very complex. To clarify the relevant factors and content of teacher performance evaluation, so as to effectively improve the quality and level of performance evaluation. At the same time, the school should establish a complete team of teachers, enhance the level of teacher education and teaching, improve the daily management level of educational administrators, carry out ideological and political construction on the team of teachers, improve the functional cognition of the team of teachers, and establish a positive performance evaluation psychology.

Integrate the service management responsibilities of colleges and universities, and improve the scientificity and feasibility of performance evaluation indicators. The application of FAHP in performance evaluation should take into account the development of students and the work of teachers, promote the improvement of teachers' teaching level and ability, improve students' learning attitude, and promote the establishment of a good teaching relationship between teachers and students. Adopting FAHP can improve teachers' understanding of teaching and management, give corresponding support and cooperation to performance evaluation, and create a good education and teaching environment (Yang, 2015).

The results of performance evaluation guide the allocation of college funds and teachers' salaries, and play an incentive and restrictive role. Establish a performance evaluation mechanism with clear rewards and penalties, and give corresponding encouragement to teachers with good performance. On the contrary, teachers with poor performance will be punished. In this way, under the perfect incentive and restraint mechanism, teachers will greatly enhance their work enthusiasm for their own development. The effective implementation of a good evaluation mechanism has promoted the implementation of the school performance evaluation mechanism, and more effectively promoted the improvement of the school running quality.

Conclusion

As a mathematical tool, fuzzy theory provides a scientific and effective way of thinking for human resource management in Colleges and universities. It can make colleges and universities increase the scientific content in the process of introducing and cultivating talents, and realize the effective transition from subjective judgment to objective evaluation. It uses fuzzy evaluation to bring the characteristics of talents related to majors and posts into the scope of overall investigation, So as to greatly reduce the possibility that the school will be denied other talents due to their relative lack of age and work experience in the process of talent introduction. Fuzzy management is the management product of the new era. With the arrival of the new economic era, scientific and technological knowledge has become the first element to promote the development of productive forces. Therefore, as the carrier of knowledge, talents have been raised to a higher position than everything else. This leads to modern

human resource management, which focuses on how to mobilize people's enthusiasm, initiative, creativity and promote people's free and all-round development. This requires corresponding fuzzy definitions, fuzzy control, fuzzy assessment, fuzzy feedback, fuzzy guidance and other fuzzy human resource management methods (Kececi et al, 2015).

References

Abdulqadir, Ahmad. (2017). "A New Model of Information Systems Efficiency based on Key Performance Indicator (KPI)." *International Journal of Advanced Computer Science & Applications* 8.3.

Antonioni D. (1996). Designing an effective 360-degree appraisal feedback process[J]. *Organizational Dynamics*, 25(2):24-38.

Baiden J., Baiden Y. P., Ayariga C. (2016). Assessing the Balance Score Card of the Internal Audit Performance-Value Addition or Destruction: An Empirical Study of Firms in Sekondi-Takoradi, Ghana[J].

Biljana Pesalj, Andrey Pavlov, Pietro Micheli. (2018). The use of management control and performance measurement systems in SMEs: A levers of control perspective[J]. *Production Planning and Control*, Volume 29:367-385

Brynjolfsson E, Yu J H, Simester D.(2011). Goodbye Pareto Principle, Hello Long Tail: The Effect of Search Costs on the Concentration of Product Sales[J]. *Management Science*, 57(8):1373-1386.

Cardona, P. , & Rey, C. . (2022). *The limits of management by objectives*. Springer Books.

Chandhana, K. , & Easow, D. T. . (2015). Performance appraisal method used in top 10 it companies-360 degree feedback & balanced score card: a review. *Bonfring*(2).

Chowdary R . (2017). BALANCE SCORE CARD[J]. *INA-Rxiv*.

Fang Zhenbang, Chen Xi.(2017). *Performance Management [M]*. Beijing: China Renmin University Press, p42-54.

Gao Xiaoyue. (2017). Application Errors of 360-degree Performance Appraisal in Chinese enterprises. *Business Management* (11), 89.

HP-GSB, Namibia.(2015). Adopting Balance Score Card in Higher Education[J]. *International Journal of Strategic Information Technology & Applications*.

Ji L , LI.(2011). Evaluation on Construction Enterprises' KPI Safety Performance Based on SEM[J]. *China Safety Science Journal*.

Jiang Huihui. (2016). Research on Modeling of Employee Performance Appraisal in tobacco enterprises.

Jun-Nan, H. U. , Zhang, J. , & Deng, H. . (2017). Establishment of performance evaluation index system of railway transport enterprises based on balanced score card. *Railway Transport and Economy*.

Kai, S. , et al. (2012). "360 Degree multi sensor fusion for static and dynamic obstacles." *Intelligent Vehicles Symposium IEEE*.

Li Haibing. (2016). The application of 360-degree Performance Appraisal Method in college teachers' performance Appraisal. *Business Management* (11), 128.

Li Pei. (2016). Analysis on 360-degree Performance Appraisal Method of University Administration. *Small and Medium-sized Enterprise Management and Technology* (23), 2.

Li Suying. (2016). The effective application of 360-degree Performance Appraisal in enterprises. *Business and Management* (6), 3.

Ma Chenggong. (2022). Research on the construction of multidimensional Teaching evaluation index system for university teachers based on fahp and entropy weight. *Avant-garde* (5), 3.

Marr B.(2012). *Key Performance Indicators (KPI): The 75 measures every manager needs to know*[M]. Pearson Education.

Maute D .(2009). *Zur Rolle und Nutzen von Key Performance Indicators (KPI)*.

Okolocha, C. B. . (2020). Effect of management by objectives (mbo) on organizational productivity of commercial banks in nigeria.

Park Ritai, Ding Yan, Park Chengxi, Huang Zhenghai and Shi Chenghan (2017). : balanced score card. *Journal of the Korean Society for Medical Quality Improvement*, 23.

Paul. R. Niven. (2002). *Balanced Scorecard Step by Step: Maximizing Performance and Intending Results*. John Wiley and Sons, 2002: 24-27.

Peng P X, Chan E, Qian Q K . Key performance indicators (KPI) for the sustainability of building energy efficiency retrofit (BEER) in hotel buildings in China[J]. *Facilities*, 2012, 30(9-10):432-448.

Peter F. Drucker. (2006). *The Practice of management*. Beijing: China Machine Press, 2006:252-288.

Rahardja U, Eva M Y, Rosyifa R . Optimalisasi Key Performance Indicators (KPI) Melalui Pendekatan Balance Scorecard Upaya Mengimplementasikan Performance Management System (PMS) Pada Perguruan Tinggi[J]. *CCIT Journal*, 2012, 6(1):17-34.

Rao Zheng, & Sun Bo. (2016). *Performance Management Based on KPI*. China Renmin University Press.

Rawnaq, Z. , & Kaddumi, T. . (2020). Balanced Score Card Implementation and its Effect on Banks` Financial Performance. Ridwan M, Sudirman I. (2021). Integration of the analytical hierarchy process (AHP) balance score card (BSC) model in selection of broiler agribusiness partnership model to increase income of the breeders partner in South Sulawesi[J]. *IOP Conference Series: Earth and Environmental Science*, 788(1):012215 (8pp).

Robert S. Kaplan, David P. (2009). *Norton. Balanced scorecard strategy practice*. Beijing: China Renmin University Press.

Rossi A, Warglien M. (2008). The Effectiveness of Alternative Programs of Management by Objectives on Firm Performance: An Experimental Study. (Draft Paper)[J].

Saaty T L , Kearns K P . The Analytic Hierarchy Process[J]. analytical planning, 1985.

Shi Haosu, Han Lina. (2011). Application of Fuzzy Analytic Hierarchy Process in college teachers' Performance Evaluation. *Electronic Design Engineering*, 19(5), 105-107.

Shruti J. Raval ,Ravi Kant. (2019). Benchmarking the Lean Six Sigma performance measures:a balanced score card approach[J].*Benchmarking: An International Journal*Volume 26, Issue 6. 2019: 1921-1947.

Sun Linlin. (2017). Construction of evaluation model of college teachers' innovation and entrepreneurship ability based on 360-degree performance appraisal. *Lyceum* (1), 5.

Tuic, D. , Sandu, M. R. , Ptracu, R. , & Ionescu, C. . (2021). Identification of key performance indicators related to the implementation of a hybrid energy supply system based on renewable energy sources. *IOP Conference Series: Earth and Environmental Science*, 664(1), 012058 (11pp).

Vasile E, Croitoru I. (2018). Management By Objectives - Factor Of Growth In Organizational Performance[J]. *Internal Auditing and Risk Management*, 52.

Wang Guoping. (2018). Paradigm Shift and Path Optimization of University, Performance Evaluation in the New era. *Jianghai Journal* (6), 6.

Wang Huan, DU Juan, Yang Rui. (2018). Exploration of measures to improve employee performance management. *Modern State-owned Enterprises Research*, 2018(14): 28.

Wang Yaowei. (2017). Construction of Applied University Teacher Performance evaluation Model based on improved fahp. *Journal of Academic Studies*, 13(1), 5. Wang, Y. , & Chin, K. . (2011). Fuzzy analytic hierarchy process. *International Journal of Approximate Reasoning*.

Wen Subin, Guo Yubing. (2020). Key performance indicator method: Interpretation and application cases. *Friends of Accounting*, 2020(19): 148-153.

Wu Liang. (2017). Analysis on the application of Objective Management in the education management of Higher vocational schools. *Heihe Journal* (6), 2.

Yang Dexin. (2015). Construction of University Teachers' Performance evaluation Model based on Fuzzy Analytic Hierarchy Process. *Journal of Henan Normal University: Natural Science Edition* (4), 5.

Yi Kai. (2017). Research on Relevant issues that should be paid attention to in improving University performance management. *Business Management* (28), 255.

Yu Shu. (2017). Reconstruction of teacher Performance evaluation System in Transition Colleges and Universities. *Science in Education*, 033(002), 54-58.

Zhang Di. (2018). The application of management by Objectives in Enterprise performance management. *Business Story*, 000(025), P.1-1.

Zhang Yu,. (2015). Research on the Performance Appraisal of teachers in Chinese Universities. *China Economy and Trade* (11), 2.

Zhao Gaochang, Gao Yunfang, Qin Fei, Wang Xin, & Zhou Bin. (2015). Mathematical model of performance evaluation in local colleges and universities. *Journal of Xi 'an University of Science and Technology*, 35(2), 8.

Zhao, C. , & Gudamu, A. . (2021). Ranking of teaching evaluation index system of public physical education curriculum based on management by objectives using analytic hierarchy pro