

The Application of Modern General Quantitative Assessment Technology in the Performance Assessment of University Teachers

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Abstract: To establish and establish a scientific and advanced teacher assessment system is the basic work of personnel management in colleges and universities, such as teacher selection, appointment, salary, reward and punishment, which plays an important role in the education management of colleges and universities. This study follows the basic requirements put forward by the Ministry of education of the people's Republic of China, which are teachers' morality first, teaching foremost, scientific research foremost and development foremost. By using the methods of investigation, docking and literature, the modern general quantitative assessment technology is applied to the performance assessment of university teachers, and a whole process data performance assessment scheme is constructed. It mainly includes: index design, performance scoring, etc. In order to improve the scientificity, impartiality, objectivity and positive motivation of teachers' performance appraisal, and thus to improve the problems existing in the performance appraisal of university teachers, such as emphasizing business but neglecting morality, emphasizing scientific research but neglecting teaching, emphasizing index but neglecting quantity, emphasizing score but neglecting technology, etc.

1. Introduction

The establishment and establishment of scientific and advanced teacher assessment and evaluation system is the basic work of personnel management, such as the selection, appointment, salary, rewards and punishments of university teachers, which plays a very important role in the education management of University. The current research focuses on four aspects:

The first is to explore the connotation and function of University Teachers' performance appraisal. At present, there are: pay attention to the assessment of the results of the behavior, despise the assessment of the behavior itself; pay attention to the certification of the assessment purpose, despise the incentive of the assessment purpose; pay attention to the multidimensional nature of the index system, ignore the complexity of the assessment content, etc., which not only makes the performance assessment of teachers often become a mere formality, it is difficult to achieve objective, comprehensive, scientific and fair.

The second is to think about the concept and direction of University Teachers' performance evaluation. Some scholars think that there are many problems such as only academic qualifications, only professional titles, only scientific research. For example, there are some problems in the evaluation of teachers, such as emphasizing scientific research achievements, neglecting teaching achievements, emphasizing practical work rather than potential work, emphasizing school evaluation and neglecting student evaluation, which make it difficult to obtain ideal evaluation results and play a role in mobilizing teachers' enthusiasm in teaching and educating people.

Third, the research on the methods, systems and mechanisms of the performance appraisal of university teachers. Some experts pointed out that the current performance appraisal methods of university teachers are the same and lack the connection with the orientation and development of the University; the weight of the index system is unreasonable; it attaches importance to

quantification and data, despises appraisal technology; it attaches importance to one-time appraisal, despises process appraisal and stage appraisal; it lacks the communication mechanism of appraisal, feedback mechanism and application mechanism of appraisal results; The top-down single management mode lacks the main role of teachers in performance appraisal.

The fourth is about the path of innovative university performance evaluation. Some scholars discuss the guidance, content system, steps, methods, mechanism, feedback and application of performance appraisal; some scholars study the relevant contents of teacher performance appraisal in different levels of schools, some researches are based on the performance evaluation of teachers of different specialties and categories, and some researches are based on the related problems of the performance evaluation of personnel of different positions in Colleges and universities.

The practice shows that it is impossible to achieve the ideal assessment effect only by the sound assessment system and the systematic index system without the support of the scientific assessment technology system. Therefore, it is an important condition and urgent task to apply the general quantitative assessment technology system of modern management to the assessment and evaluation of teachers in Colleges and universities, to solve the dilemma of assessment and evaluation of teachers in Colleges and universities, and to create a scientific, democratic, fair, harmonious, high-quality and efficient assessment and evaluation mechanism for teachers.

2. Quantitative Design Steps of Performance Appraisal Index System

The performance evaluation index system of university teachers plays an important role in the design proportion of the evaluation system. The quality of its design is of great significance to the quality, efficiency and even success or failure of teachers' assessment and evaluation, which is fundamental work. Therefore, in order to carry out the research on the assessment indicators of university teachers, we should adhere to the principle of "pertinence (for the main business, for the main points, for the performance, for the results), relevance (individual team, superior and subordinate, long-term and short-term effects, commonness and individuality), quantification (level by level quantification, comprehensive quantification), unity (unified calculation standards, unified assessment platform)," referential (index breadth, index depth, index details) "six design principles.

Step 1: determine the framework elements of teachers' indicators: for example, teachers' ethics, teaching performance, scientific research, teacher development, social services, etc.

Step 2: determine the total standard of the quantitative index system as 100 points.

Step 3: rank the importance of the quantitative index elements according to the comparison between the two and the quantitative principle of ratio method: Teachers' moral style-5, teaching performance-4, scientific research-3, teacher development-2, social Service-1.

Step 4: divide the serial numbers of each indicator element into total serial numbers: $5 + 4 + 3 + 2 + 1 = 15$ points;

Divide the sequence number score of each indicator element and the total sequence number score in order to obtain the weight value of each indicator classification element (compliance score). Teachers' morality and style $5 \div 15 = 33\%$, teaching performance $4 \div 15 = 27\%$, scientific research $3 \div 15 = 20\%$, teacher development $2 \div 15 = 13.0\%$, social service $1 \div 15 = 7\%$.

Step 5: multiply the index rate of each index category by 100 points of the total standard score of the index system, and get the index scores of each index category in turn: 33 points, 27 points, 20 points, 13 points and 7 points.

Step 6: the steps and methods of index item quantification are the same as those of index category. Each index item can be set with 2-5 equal difference index degrees as required. Several scoring points can be set for each indicator degree, and there is no limit on the number.

It should be noted that the basis for the quantitative design of index items is the index score of the superior index.

3. Construction of Assessment Index System and Connection of Universal Quantitative Assessment Technology

On the basis of determining the framework elements of teachers' performance appraisal indicators, each element should be further decomposed, and the decomposed secondary indicator elements should also be ranked in importance, and the weight should be calculated.

The details are as follows:

Table 1. The index system and design basis of quantitative assessment of University Teachers' performance

Index class	Index item		Index score	Evaluation basis	Explain
Weight value of teacher's virtue and style: 33	1	Political consciousness	11	The spirit of the ten principles of "higher education teachers' professional ethics", "the new generation of teachers' professional conduct in new era", and the spiritual connotations of several important speeches of general secretary Xi Jinping, relevant laws and regulations, school regulations and discipline.	It needs to be further refined into observable behavior assessment standards; it can be divided into two parts: bottom line requirements and ideal requirements; it can be divided into plus points and minus points. $11+8.9+6.6+4.3+2.3=33$
	2	Moral integrity	8.9		
	3	Imparting knowledge and educating people	6.6		
	4	Scholarly attitude	4.3		
	5	Social services	2.3		
Weight value of teaching performance: 27	6	Teaching task	7.8	According to the requirements of the workload of teachers in Colleges and universities, complete the tasks to be completed during the employment period;	It needs to be further refined into observable behavior assessment standards; it is consistent with the school's workload calculation method, but it needs to be converted into index scores. $7.8+6.5+5+2.6+2.6+2.6=27$
	7	Teaching process	6.5		
	8	Teaching effectiveness	5		
	9	Teaching extension	2.6	According to the workload calculation method of each university, the scores of relevant projects are calculated;	
	10	Teaching contribution	2.6		
11	Teaching research	2.6	The workload of theoretical and practical teaching is carried out according to the tasks specified in the talent training program of each university.		
Weight value of scientific research: 20	12	Academic achievements	13	Calculate the scores of relevant projects according to the workload calculation method of each university.	It needs to be calculated by category, and then converted into index score. $13+7=20$
	13	Achievements of industry, university and research	7		
Weight value of teacher development: 13	14	Qualification confirmation	6.5	Confirm according to relevant regulations and standards of higher education department, human resources and labor department and social organizations.	It needs to be calculated by category, and then converted into index score. $6.5+4.3+2.2=13$
	15	Continuing Education	4.3		
	16	Special ability	2.2		
Weight value of social services: 7	17	Paid service	4.7	According to the tasks, relevant arrangements and documents issued by the school. Evidence is needed for activities that individuals voluntarily participate in.	Refer to the scoring method of teaching extension, and make conversion. $4.7+2.3=7$
	18	Gratuitous service	2.3		
Total	Total target rate		100		

4. Ideas on Adjusting the Connotation of Performance Appraisal Indicator System

The design of evaluation index is the first and key link in the whole evaluation activity. Its design quality is directly related to the direction of performance guidance and the effect of performance incentive. The connotation of index is the life and soul of the whole index system. Therefore, it is necessary to sort out and design the relevant policies and regulations, teaching tasks,

post structure, business categories, teaching process, work weight, index system, assessment effect and so on with a very rigorous and scientific attitude. This paper puts forward the following ideas.

4.1. Ethics

It is mainly based on the spirit of documents such as the code of professional ethics for teachers in Colleges and universities, the ten standards of professional conduct for teachers in Colleges and universities in the new era. In particular, the spirit of a series of important speeches, such as general secretary Xi Jinping's speech at the September 10, 2018 national education conference, and March 18, 2019's speech at the school teachers' Symposium on Ideological and political courses. The standards of teachers' moral conduct in Colleges and universities are: firm political orientation, conscious patriotism and law-abiding, spreading excellent culture, devoted to teaching and educating people, caring and caring for students, adhering to elegant words and deeds, abiding by academic norms, upholding fairness and integrity, adhering to integrity and self-discipline, and actively contributing to the society. "Four teachers" proposed by President Xi Jinping: ideal and faith, moral sentiment, solid knowledge and benevolence; four "guiders": guiders of students' character, learning knowledge, innovative thinking and dedication to the motherland; four aspects of unity: unity of teaching and education, Adhere to the unity of oral and personal teaching, focus on the unity of asking questions and paying attention to society, and adhere to the unity of academic freedom and academic norms.

Teachers' morality and style are professional behaviors and essential requirements of education, which must be put in the first place and run through the whole process of education and teaching. Teachers' morality and style are composed of two parts: bottom line requirement and ideal requirement, which are normative and non-standard, as well as hierarchical, so it is necessary to further refine the performance assessment standards. There can be bonus points or bonus points.

4.2. Teaching Performance

The teaching performance of university teachers is complex, which can be divided into six aspects: teaching task, teaching process, teaching effect, teaching extension, teaching contribution and teaching research.

Teaching task: it mainly refers to the workload of daily teaching and the situation of reaching the standard specified in the talent training plan, including classroom teaching, practical teaching, guiding students' practice and graduation thesis, guiding doctoral students and graduate students, etc.

Teaching process: it mainly refers to the compliance of each link in the process of teachers' dynamic teaching, including the preparation of teaching syllabus, revision of talent training program, pre class preparation, classroom teaching organization, examination evaluation, participation in teaching activities and public welfare activities organized at all levels of the school, freshmen enrollment and graduate education, etc.

Teaching extension: it refers to teachers' participation in guiding students' second classroom activities, including guiding students to participate in innovation and entrepreneurship competitions, college students' innovation and entrepreneurship training program, Internet + competition, various professional competitions and so on.

Teaching effect: the result of teaching quality evaluation, the result obtained through self-evaluation, student evaluation and peer evaluation.

Teaching contribution: won teaching achievement award, lecture competition award, MOOC Competition Award, micro class competition award, compilation of teaching materials and award, double first-class major, key discipline, excellent teacher title, etc.

Teaching research: the development of teaching research, including hosting or participating in various kinds of teaching reform projects at all levels, publishing papers on teaching reform and papers published in useful foreign languages.

4.3. Scientific Research

The situation of scientific research carried out by teachers mainly includes two parts: academic

achievements and production, teaching and research achievements.

Academic achievements: project approval, conclusion (vertical and horizontal), publication of scientific research works, publication of academic papers, award-winning scientific research achievements, academic papers published in foreign languages, participation in domestic and foreign academic conferences, etc.

Industry University Research achievements: transformation and application of achievements, invention patents, etc.

4.4. Teacher Development

The promotion and development of the professional quality of university teachers includes three parts: the completion of qualification recognition, continuing education and the promotion of special ability.

Qualification recognition: including teacher qualification recognition, teaching famous teacher recognition, education promotion, double teacher type qualification recognition, bilingual teacher qualification recognition, title promotion, obtaining professional qualification, etc;

Continuing education: complete the credits for continuing education of professional and technical personnel, including visiting, studying and going out for short-term training, attending online course training, etc.

Special ability: the promotion and development level of special ability, such as the ability to use foreign language to teach the key points of curriculum knowledge.

4.5. Social Services

Teachers participate in activities aimed at meeting the needs of social reality, including paid services and free services, which involve economic, political, cultural, educational and other aspects. For example: poverty alleviation, supporting education, technical guidance, academic training, joint education, joint development, etc.

5. Conclusions and Suggestions

It is worth noting that the application of quantitative assessment technology is a system engineering. Index design, performance scoring, performance statistics and other methods can not only be consistent with the current workload calculation method (but need to be converted), but also can be self-contained, re scored and graded. The most basic requirement is to establish a teacher performance evaluation database with unified standards, true records, complete data and scientific statistics. With the support of the database, it is no longer difficult to carry out scientific and democratic, fair and just, significant incentive effect and rich and colorful teacher incentive activities.

The establishment of a data-based teacher assessment operation platform, operation process and operation mechanism including performance index design, performance process record, performance statistics, performance compensation distribution, performance rewards and punishments and incentives, can solve the problem that teacher assessment and evaluation can not be quantified, and fundamentally change the form of teacher assessment and evaluation based on human relationship To provide strong technical support for the innovation and creation of a scientific, democratic, civilized and modern assessment mechanism for university teachers.

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