

# Research on Optimization Design and Operation of Professional Performance Evaluation Indicator System in Higher Vocational Colleges from the Perspective of KPI

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## Abstract

**Key performance indicator (KPI) is the basis for establishing professional performance evaluation indicator system in higher vocational colleges. The formulation of the KPI system is oriented toward the phased professional development goals; and the quantifiable key evaluation indicator and weight can be obtained by setting step by step. KPI professional performance evaluation focuses on the objectivity, fairness and unity of process and result application, in order to promote higher vocational colleges to form a good professional dynamic adjustment mechanism, and encourage high-quality majors to develop toward branding and internationalization.**

## Keywords

**KPI; professional performance evaluation indicator system.**

## 1. NECESSITY OF PROFESSIONAL PERFORMANCE EVALUATION IN HIGHER VOCATIONAL COLLEGES

Major construction is the core of teaching construction in higher vocational colleges. Major construction is a systematic project involving many aspects, its basic elements include: major structure, curriculum system, teaching operation and management, experiment and training conditions, teacher teams of school-enterprise cooperation, teaching objects, etc. Therefore, the scope of performance evaluation for major construction work should be many-sided and multi-level; its evaluation results should meet the short-term development needs of major and the long-term planning needs of major; it is mainly manifested in the interaction degree with regional industries and enterprises as well as the matching degree with teachers and students' development needs.

(1) The needs for major settings to agree with adjustment of regional industrial structure

During the "13 Five-Year Plan" period, faced with the layout adjustment of the regional industrial structure, new technologies lead the rise of industry and industrial clusters, and this trend is becoming more and more obvious, as main force for training "vocation education" high-skilled technical talents, higher vocational colleges should form a dynamic adjustment mechanism for interaction with regional industries in major setting, achieve "what are the pillar industries in the region, what majors are set up". As of August 31, 2018, more than 60% of higher vocational colleges in our country have opened majors of equipment manufacturing, electronic information, financial and trade, tourism, and culture and art, among them, the number of computer colleges and universities which open the electronic information major reached 77.74% (data source: Higher Education Data Center of the Ministry of Education), which is inseparable from the new features and requirements of economic development of China's "Internet +" and "Made in China 2025". Higher vocational colleges plan major layout according to the evaluation results of regular professional performance, retain the development

of high-quality and characteristic majors, cancel or adjust the disadvantaged major, and deeply agree with the transformation and upgrading needs of regional industrial structure.

(2) The needs for professional development to meet deep integration of schools and enterprises

School-enterprise cooperation and industry-education integration are the basic characteristics of professional personnel training mode in higher vocational colleges, it is manifested in the joint formulation of personnel training programs, joint development of courses and textbooks, and joint construction of teaching resources database between higher vocational majors and enterprises; moreover, enterprises provide vocational students with practice places, part-time teachers, etc., higher vocational majors provide technical services and training for enterprises; moreover, higher vocational majors and enterprises also jointly explore various training modes, such as modern apprenticeship, order class, entrepreneurship class and so on. Therefore, the number of courses, teaching materials and order class for school-enterprise cooperation, the annual income which majors provide technical services for cooperative enterprises; the number of staff which majors train for cooperative enterprises can be used as observation points of major performance evaluation. According to statistics, the number of higher vocational majors cooperating with enterprises in our country accounted for 70.76% of the total number of major settings, and the proportion of graduate trainee employed by enterprises reached 75.61%. (Source: Higher Education Data Center of the Ministry of Education)

(3) The need for professional development to enhance the teaching and scientific research level of the teaching staff

The fundamental purpose of professional performance evaluation in higher vocational colleges is to make professional teachers and students' literacy and ability develop simultaneously by promoting the improvement of professional development level. The teaching and scientific research achievements of the professional teacher team are important indicators for measuring the professional personnel training and social service quality, and they are also an important observation point for professional performance evaluation. The majors with outstanding evaluation must have a double-quality faculty with high quality, strong teaching practice and research and development ability, and require double-quality teachers to account for more than 90% of the total number of full-time teachers.

(4) The need for professional development to promote the all-round development of students

In recent years, the "student-oriented" concept of running schools has been fully embodied in the major construction of higher vocational colleges. When formulating talent training programs, higher vocational majors should start from the students' reality and take into account both the needs of personality development and all-round development. Considering the development quality of students can start from major enrollment, employment, science and technology competition awards, innovation and entrepreneurship, international exchanges, etc., and then refine the items of evaluation indicator, such as the ranking of major filing score line, the correlation degree of major employment, the starting salary level of graduates, the graduates' overall satisfaction with the major, majors hold Chinese-foreign cooperation projects, develop or introduce major teaching standards and curriculum resources outside the country, etc.

## **2. CONNOTATION AND INTERPRETATION OF KPI IN THE PROFESSIONAL PERFORMANCE EVALUATION INDICATOR SYSTEM IN HIGHER VOCATIONAL COLLEGES**

(1) Literature review on the definition and application of KPI

KPI (Key Performance Indicator) is a performance evaluation tool that modern enterprises lay down and gradually achieve their strategic goals, it is a project that can transform strategy into action and result, namely, it is also a process and activity that transforms enterprise strategy into internal operations, and the evaluation system not only becomes a means of incentives and constraints, but also becomes a strategic implementation tool, the most critical aspect of KPI is the formulation of indicators. Incorrect KPI indicators may dampen the enthusiasm of internal members and it does not play a role in clearly guiding the working direction for internal members. Moreover, the KPI must have the following important characteristics: first, the KPI must be a specific indicator that can be quantified, the calculated or estimated indicators cannot be a KPI, and the trait-like indicators (such as love, responsibility, etc.) should not be used as evaluation indicators; second, the KPI must be a key factor that can reflect the success of an organization; third, any key indicator can be selected, the essence of the evaluation is the process from natural selection to enhanced selection, the core of enhanced selection is to determine the evaluation indicators and standards, namely determine enhanced factor and enhanced scale; fourth, the selection should be carried out jointly by the evaluation parties, its premise is full communication.

Except for internal performance management of enterprise, KPI is gradually adopted by universities and other public institutions, such as college teachers' job performance evaluation, scientific research performance management, secondary college management, administrative personnel' performance evaluation, and college students' entrepreneurial enterprise performance. Regardless of the KPI of any field, it must take the school's strategic goals as the prerequisite, the school's strategic goals should be the key to the department (secondary college) to complete specific tasks and achieve individual performance goals, individual achieves performance goals by completing specific tasks as well, in order to achieve a win-win goal for schools, departments (secondary colleges) and individuals. The author found that there are few theoretical research results on the application of KPI in the major construction in higher vocational colleges in the application research of KPI in related fields of colleges and universities at present, the major construction of higher vocational colleges is the main work of school running, which is also the key to success or failure of running schools, therefore, studying KPI-based performance evaluation system for higher vocational major has both theoretical and practical significance.

(2) KPI analysis of the professional performance evaluation indicator system in higher vocational colleges

The KPI of professional performance evaluation in higher vocational colleges must firstly be the key factor affecting the success or failure of higher vocational major construction, which takes the macro development goals of the school in a specific period as the prerequisite. The evaluation process is from the superior departments (secondary college), carry out target hierarchy for different majors, the signing of the annual task book as the starting point, implement task for different items, and then carry out the system evaluation, finally implement analysis and feedback for evaluation results, and take corresponding measures to reform. At present, China's higher vocational colleges are in construction period of the "13th Five-Year Plan", therefore, the objectives and standards of the KPI major performance evaluation indicator system must take the school's "13th Five-Year" major construction and development plan as the prerequisite, fully consider the construction requirements of the first-class major, divide the school's strategic goals into performance goals of department (secondary colleges), major and individual, make clear the core content of each job responsibilities, and quantitatively and objectively evaluate the execution and completion of the work, of course, in order to implement fair and effective KPI professional performance evaluation, it is necessary to establish a diversified professional performance evaluation indicator system based on big data analysis.

### 3. DESIGN AND OPERATION OF PROFESSIONAL PERFORMANCE EVALUATION INDICATOR SYSTEM IN HIGHER VOCATIONAL COLLEGES BASED ON KPI THEORY

The author believes that in order to establish KPI professional performance evaluation indicator system, it is necessary to establish the management concept of big data. The evaluation system is supported by objective data, the more extensive and objective the data sources are, the closer the evaluation results are to reality. Major construction status data of higher vocational colleges can be obtained from various channels; it can be collected by schools spontaneously organizing various majors, or superior departments require schools to collect data as well. Before data acquisition, the key performance indicators KPI should be selected first, then diversified KPI details and weights should be set up, and then Then formulate an algorithm for KPI details, finally, the performance evaluation indicator system suitable for the professional development of our school is formed.

(1) Design principles of KPI professional performance evaluation indicator system in higher vocational colleges

In order to achieve the development strategy goals of major, higher vocational colleges must establish the KPI system according to their actual conditions, and use it to measure the effect of professional development strategy implementation. When the higher vocational school conducts KPI system design, the first is to follow the SMART principle: S stands for the specific principle; M stands for measurable principle; A stands for attainable principle; R stands for realistic principle; T stands for the time-bound principle; the second is to follow the PDCA (Plan Do Check Action) circulation rule, the following points should be grasped:

1. The KPI professional performance evaluation indicators of higher vocational colleges should reflect the quality concept of professional development. Quality is the core of professional competitiveness, but it is difficult to measure, therefore, it is particularly important to control the establishment of specific measurable indicators for "quality".

2. KPI professional performance evaluation indicators established by higher vocational colleges must be achievable, namely KPI indicators should be controlled and can be achieved through hard work. Therefore, each indicator must be given clear definition, establishes sound information collection channels to obtain the required data, moreover, the KPI must be simple and clear, and easily accepted and understood by the examiner and the examinee.

3. The KPI professional performance indicator system of higher vocational colleges should fully reflect the actual professional development condition in a certain period. Through the tracking and monitoring of the KPI indicator system, the schools can understand the development condition of the major in real time, find out the problems in time, grasp the deviation condition of the actual situation, the annual task book and the strategic objectives, and then correct the deviation of the performance evaluation indicators, summarize and further propose improvement measures, standardize results, determine new goals, and work out the next round of plans.

(2) Design methods of KPI professional performance evaluation indicator system in higher vocational colleges

1. Determine professional key performance indicators

The determination of KPI professional performance evaluation indicator should be based on a large number of data analysis related to professional development, multi-dimensional key performance indicators are selected after the two parties fully communicate according to the actual situation, and then refine the selected key performance indicators to the next level of indicators, all indicators must be determined around professional development goals.

In general, the main factors affecting professional development include basic school conditions, school expenses, school students' condition, graduates' condition, majors and curriculum construction, faculty, school-enterprise cooperation, and social evaluation eight dimensions, then the professional key performance indicators (KPI) are extracted from these eight basic dimensions, as shown in Table 1:

**Table 1.** Professional key performance evaluation indicators based on professional development planning

| school orientation and professional development planning | KPI order number        | main influencing factor           | key performance indicator(KPI)  |
|--|-------------------------|-----------------------------------|---|
|  | 1                       | basic school conditions           | teacher-student ratio of major  |
|  | 2                       |                                   | students station per capita on-campus training base                         |
|  | 3                       |                                   | students per capita teach scientific research equipment                     |
|  | 4                       | school expenditure                | professional teaching reform and research expenditure                       |
|  | 5                       |                                   | professional teacher construction expenditure                               |
|  | 6                       |                                   | professional daily teaching expenses  |
|  | 7                       | school students' condition        | level and quantity of students' science and technology competition award    |
|  | 8                       | graduates' condition              | graduates' employment rate  |
|  | 9                       |                                   | graduates' starting salary level  |
|  | 10                      |                                   | professional employment relevance   |
|  | 11                      | major and curriculum construction | whether it is a dominant characteristic major                               |
|  | 12                      |                                   | professional high-quality course level and number                           |
|  | 13                      |                                   | the number and quality of professional information course                   |
|  | 14                      |                                   | the number and quality of professional international course construction    |
|  | 15                      | faculty                           | professional teachers' educational background and academic degree structure |
|  | 16                      |                                   | professional teachers' title structure                                      |
|  | 17                      |                                   | professional teachers' teaching and scientific research performance         |
|  | 18                      |                                   | proportion of professional double-quality teachers                          |
|  | 19                      | school-enterprise cooperation     | the number of professional courses constructed by school and enterprise     |
|  | 20                      |                                   | the number of professional textbooks compiled by school and enterprise      |
|  | 21                      |                                   | the number of teaching resources built by school and enterprise             |
|  | 22                      |                                   | the number of practice teaching bases built by school and enterprise        |
|  | 23                      | social evaluation                 | enrollment number and student type of major                                 |
|  | 24                      |                                   | file score of major   |
|  | 25                      |                                   | new students' registration rate   |
| 26   | employers' satisfaction |                                   |   |

## 2. Set the weight of professional key performance evaluation indicators

After the professional key performance evaluation indicators are determined, the setting of the indicator weights is recommended to take the department (secondary college) person in charge, professional person in charge, teacher representative, partner unit representatives, etc., calculate the average score of each indicator, then use the judgment matrix to calculate the weight ratio, if there is little difference, the average weight calculated by the score prevail, if there is big difference, then adjusted, the weight of eight-dimension KPI indicators are mainly set, as shown in table 2:

**Table 2.** Weight distribution of eight dimensions

| dimension                                   | KPI   | indicator weight |
|---|-------|------------------|
| dimension 1: basic school conditions        | 1-3   | A%               |
| dimension 2: school running expenses        | 4-6   | B%               |
| dimension 3: students' condition in school  | 7     | C%               |
| dimension 4: graduates' condition           | 8-10  | D%               |
| dimension 5: majors and course construction | 11-14 | E%               |
| dimension 6: faculty                        | 15-18 | F%               |
| dimension 7: school-enterprise cooperation  | 19-22 | G%               |
| dimension 8: social evaluation              | 23-26 | H%               |
| total                                       |       | 100%             |

(2) Problems that should be paid attention to during the operation of KPI professional performance evaluation indicator system in higher vocational colleges

1. KPI professional performance evaluation should embody the unity of professional development and personal self-value realization

KPI professional performance evaluation in higher vocational colleges is a professional performance evaluation system which takes incentives as the purpose, and it changes evaluation mechanism based on the traditional single-item reward, and turns negative incentives into positive guidance; establishes professional dynamic adjustment mechanism, professional person in charge evaluation method, construction guidance opinion of leading major, implementation rules of professional group construction and supporting professional management documents, guide the various types of personnel in the major to fully give full play to their initiative with a systematic comprehensive evaluation mechanism, make the act of pursuing self-value realization resonate with the school's strategic goal.

2. The evaluation process of KPI professional performance should grasp the unity of controllable factors and non-controllable factors

The professional management of higher vocational colleges is very complicated system engineering; the factors affecting the success or failure of professional development include both quantifiable and controllable factors and unpredictable uncontrollable factors. Therefore, although the KPI professional performance evaluation model has many advantages, it also has its limitations; improper operation is likely to fall into the "digital trap" of quantitative evaluation. Each quantitative indicator in the evaluation system must have channels to acquire real data sources, and must truly cause critical impact on achieving the school's professional development strategy goals. Moreover, higher vocational colleges also need a strong information management platform as a support for data acquisition, analysis, feedback and monitoring. In addition, when using the KPI indicator system to carry out professional performance evaluation, the examiner should consider the human factors and elastic factors

that are difficult to avoid in the process of achieving the goal; after all, the direction and focus of professional development in different periods are different.

3. KPI professional performance evaluation should focus on the unity of evaluation process and result application

The professional performance evaluation results based on KPI can systematically reflect the actual situation of professional development in higher vocational colleges, its credibility is high. Therefore, the application of professional performance evaluation results based on KPI should be effectively expanded. Through the application of KPI professional performance evaluation mode, the whole school can be divided into four levels: excellent, good, qualified and unqualified, measures should be taken to adjust, amalgamate or cancel the majors that have continuously failed the evaluation, resources should be allocated reasonably in majors to form a dynamic adjustment mechanism for majors, so as to maintain the coordination of major construction and regional economic and social development. Moreover, schools should give appropriate material rewards to majors whose performance evaluation of major construction work is excellent, and take the result of professional performance evaluation as an important basis for the evaluation of person in charge. In the application of the evaluation process and evaluation results, a supervision team should be established, which is responsible for the discipline inspection committee of the school, and involves the department leaders (second-level college), experts, teachers and cooperative units, and ensure fair and open evaluation process and results.

#### 4. CONCLUSION

In summary, the higher vocational colleges implement KPI professional performance evaluation, which is conducive to achieve professional development goals in different periods, and meet the essential needs of regional economic and social development, industrial enterprise transformation and upgrading, and all-round development of teachers and students. The KPI professional performance evaluation indicator system not only reflects the inherent requirements of "school-enterprise cooperation, production and education integration" professional development, it also shows that the education projects of higher education colleges are systematic "enrollment-cultivation-employment" three linkages. Through competitive selection, higher vocational colleges encourage high-quality major to develop toward first-class major at home and international brand.

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