Construction of Higher Vocational College Curriculum Diagnosis and Improvement Index System Based on AHP

Jin-Yan SHI\textsuperscript{a} and Yong-Chao XIE\textsuperscript{*}

Hunan Railway Professional Technology College, ZhuZhou, China

\textsuperscript{a}shijinyan2008@126.com, \textsuperscript{*}xieyongchao2008@126.com

Keywords: AHP; Vocational College; Curriculum; Diagnosis and improvement.

Abstract. The course diagnosis and the improvement work have the vital significance to the promotion of higher vocational college's personnel training quality. The index system of curriculum diagnosis and improvement in higher vocational colleges is constructed by using AHP method, which provides a certain basis for the work of curriculum diagnosis and improvement.

Introduction

On June 23, 2015, the General Office of the Ministry of Education issued document No. 2015-2 of the Teaching Staff Office of the Ministry of Education, entitled "notice on the establishment of a system for diagnosis and improvement of teaching work in vocational schools," vocational colleges should earnestly fulfill the responsibility of the main body of Quality Assurance of Personnel Training and establish a regular periodic diagnosis and improvement system of teaching work [1]. In June 2017, the Ministry of Education issued a notice on comprehensively promoting the construction of a diagnosis and improvement system for teaching and learning in vocational schools (No. 56 [2017] of the Ministry of Education), the administrative departments of education at the provincial level are required to earnestly perform their leading duties in the work of medical diagnosis and reform, further improve the planning of the work of medical diagnosis and reform in vocational colleges at the provincial level (2017-2020), and all vocational colleges are required to start the work of medical diagnosis and reform in accordance with the requirements of the circular. Since then, China's vocational colleges’ internal quality assurance system construction work started in an all-round way. According to the theory of "five vertical, five horizontal and one platform" put forward by the National Special Committee of Medical Examination and reform, vocational colleges should carry out regular "self-examination and reform" in five horizontal levels: School, Specialty, curriculum, teacher and student [2].

Overview of the Analytic Hierarchy Process

The Analytical Hierarchy Process (AHP) was first proposed by Thomas L. Saaty who is an American operations research scientist and professor at University of Pittsburgh in 1970s, the goal is to solve a lot of problems that can't be solved by quantitative analysis, through human choice and judgment, and careful study of the laws of decision making thinking [3].

The analytic hierarchy process (AHP) involves hiring experts who are familiar with the research, generally using the 1-9 scale method from top to bottom, and through empirical analysis, determining the ratio of relative importance of two-to-two comparisons among factors, and writing out the matrix form, by computing the standardized feature vector of the Matrix and checking the consistency, we can get the weight value of the relative importance of a layer factor relative to the previous layer factor, that is, the weight value of the single rank.

Furthermore, the relative importance weight of the factor in the upper level, that is, the total ranking weight, can be calculated by the weighted synthesis of the factor in the upper level. In this way, from top to bottom, the weight of the lowest level factor, that is, the relative importance of the concrete evaluation index to the top level goal can be calculated.
Constructing the Index System of Curriculum Diagnosis and Improvement in Higher Vocational Colleges

Curriculum is the core of education and teaching, especially in the field of professional, standard and normative vocational education. The standardization of curriculum construction is the core element of training technical talents [4, 5, 6].

By consulting a large number of literature on curriculum diagnosis, curriculum teaching evaluation, and using multiple rounds of consultation with experts, the evaluation indexes are determined, and then an investigation is carried out by developing an expert consultation questionnaire, the influence weight of each evaluation index is analyzed, then using the analytic hierarchy process and constructing the AHP judgment Matrix, finally the reasonable higher vocational curriculum diagnosis and the improvement index system is developed, as Table 1 shows.

Table 1. Curriculum Diagnosis and Improvement Index System in Higher Vocational Colleges.

| First-class indicators | second-class indicators | third-class indicators |
|------------------------|------------------------|-----------------------|
| Course objectives      | Course construction planning and program | Curriculum construction planning objectives is clear. |
|                        |                        | Curriculum construction program is reasonable and feasible. |
|                        |                        | The person in charge of curriculum development has been designated. |
| Objectives of the course | The course teaching goal originates from the Professional Training Program | course can support the professional ability goal clearly |
| Course design          | Analysis of teaching objects | Correctly determine the teaching content |
|                        |                        | accurately analyze the students' situation |
|                        |                        | Determining the key points and difficulties in teaching |
|                        | determination of teaching objectives | knowledge goal is clear |
|                        |                        | skill goal is clear |
|                        |                        | quality goal is clear |
|                        | design of teaching strategies | Design teaching links and activities reasonably |
|                        |                        | Design teaching methods appropriately |
|                        |                        | Design teaching activities organizing forms reasonably |
|                        |                        | select teaching media and teaching resources appropriately |
|                        |                        | select appropriate test exercises appropriately |
| Course resources       | course book | Select course book to meet students' needs |
|                        | Library of curriculum resources | Training assignments and instructions is written |
|                        | Have curriculum standards, curriculum plans, lecture notes | |
|                        | Have Online course learning platform | |
|                        | Have a sufficient number of Microteaching video | |
|                        | Have a sufficient number of teaching courseware | |
|                        | Have a sufficient number of exercise bank | |
| Practical teaching conditions | There is special courses training room | |
|                        | The training room has enough training table for students | |
|                        | The training room is equipped with special administrator to ensure the normal training equipment | |
|                        | The training room combined with corporate culture has developed a 6S assessment standard | |
| Course team            | Course team | Set up a course team |
|                        | the number of course team is reasonable | |
|                        | Employment of part-time teachers | |
| Curriculum implementation | Teaching Implementation | Strict implementation of the teaching plan |
|----------------------------|------------------------|------------------------------------------|
|                            |                        | Adopt project teaching, mixed teaching, Flipped Class Model for the implementation of curriculum teaching |
|                            |                        | The appropriate use of information-based teaching means |
|                            |                        | Teachers and students interact effectively |
|                            |                        | Stimulate students’ learning motivation |
|                            |                        | Effectively strengthen key points, break through difficulties |
|                            |                        | Focus on individual layered guidance |

| Course evaluation | Evaluation program with multi-evaluation subjects, multi-evaluation methods, effective evaluation standards, perfect evaluation process |
|                  | Appropriate number of course process assessment |

| Course results | Teaching effectiveness | To achieve the goal of the supervision evaluation (90 points) |
|               |                       | To achieve the students’ goal of the course teaching score (90 points) |
|               |                       | To achieve the goal of the course passing rate (greater than 90%) |
|               |                       | To achieve the goal of the course excellent rate (greater than 20%) |
|               |                       | To achieve the course average score (greater than 80 points) |

| teaching attitude | Achieve the target of teacher attendance rate (100%) |
|                  | Achieve the target of teacher transfer rate (less than 10%) |
|                  | Achieve the target of teaching content completion rate (100%) |

| course diagnosis and reform mechanism | Established the mechanism of curriculum diagnosis and reform |
|                                      | have the course quality report each semester |

**Conclusion**

The construction of a set of higher vocational curriculum diagnosis and improvement index system provides a certain basis for the development of higher vocational curriculum diagnosis and improvement, enriches the content of educational diagnostics, and is conducive to promoting the research of curriculum teaching theory, perfecting the theory of curriculum diagnosis in higher vocational education.

At the same time, the course diagnosis and improvement can improve the course teaching quality and students’ learning effect, promote the common development of teachers, students and schools, and also help to realize the goal of the course reform in higher vocational colleges and solve the practical problems of course teaching, it has a strong application value.

**Acknowledgment**

Supported by Hunan Province Philosophy and Social Science Fund Project: the Development and Application Research of Higher Vocational College Curriculum Diagnosis and Improvement Index System based on AHP (No. 18YBG022); Hunan Province Vocational Colleges Education and Teaching Reform Research Project: Research on constructing index system of diagnosis and improvement of higher vocational classroom teaching based on AHP (No. ZJGB2019063).
References

[1] Ministry of Education. Circular of the General Office of the Ministry of Education on establishing the system of diagnosis and improvement of teaching work in vocational colleges and universities [EB/OL]. [2015-06-24].

[2] Yang Yingsong. Medical reform is not a "straitjacket" imposed on schools [N]. China Education News, 2016-07-05.

[3] Zhang Letian and Liu Dianhong. Research on the evaluation system of higher vocational students’ comprehensive quality based on AHP [J]. China vocational and technical education, 2015 (26).

[4] Zhou Jun. Research on diagnosis and improvement of teaching work in vocational colleges based on Quality Promotion [J]. China vocational and technical education, 2015 (26).

[5] Wan DeNian. Research on teaching diagnosis and improvement in Higher Vocational Colleges [J]. Vocational Education Forum, 2017 (16).

[6] Liu Hai. Teaching diagnosis and improvement: The endogenous impetus of quality improvement in vocational colleges [J]. Vocational and technical education, 2016 (18).