Analysis on the Construction of Practical Teaching Evaluation System in Higher Vocational Colleges Based on CIPP Model

Xiaotong Wang[1a], Xiaoxue Ma[2b]

[1, 2]Department of Intelligent Manufacturing Engineering, Chongqing College Of Architecture And Technology, Chongqing, 401331, China

[a]54736138@qq.com, [b]1085959667@qq.com

Abstract. As an important part of vocational education, the quality of practical teaching will directly affect the overall quality of talent training and education in higher vocational colleges. How to ensure the education quality of higher vocational colleges by improving the quality of practical teaching is a difficult problem faced by all higher vocational colleges. Based on the CIPP evaluation model, this study deeply analyzes the evaluation of practical teaching quality and its system construction in higher vocational colleges, and explores the construction of practical teaching quality evaluation system.

Keywords: CIPP evaluation model; teaching quality evaluation; practice teaching

1   Introduction

At present, the educational circles pay less attention to the research on the evaluation of practical teaching quality and its system [1]. In terms of the selection of research objects, most studies pay more attention to undergraduates, thus ignoring the research on the evaluation system of practical teaching quality in higher vocational colleges [2][3]. Compared with undergraduate colleges, higher vocational colleges pay more attention to the practical characteristics of teaching in the goal of talent training. It is of great significance to analyze the construction methods, ideas and countermeasures of the evaluation system of practical teaching quality in higher vocational colleges to improve the quality of practical teaching and cultivate students ' practical ability.

2   The theoretical construction of evaluation system

The CIPP evaluation model was proposed by Stufflebeam. D. in 1960 [4]. It is a system evaluation model composed of four comprehensive variables, including context evaluation, input evaluation, process evaluation and product evaluation. Using this evaluation theory as the basis to construct an evaluation scale, it is possible to judge

the value of the evaluation object from multiple dimensions. CIPP evaluation advocates that the overall quality of education should be improved through educational evaluation, and educational methods and methods should be further improved [5].

In order to select the evaluation index of practical teaching quality in higher vocational colleges and construct the evaluation system, NVivo software [6] is used to encode the relevant literature, policy text and teacher interview text from bottom to top. By extracting the key words in the text, the three-level indexes in the evaluation system are condensed. Then through the further summary and classification of the three-level indexes, the two-level indexes in the evaluation system are formed. Finally, the second-level indexes are condensed into the first-level indexes, and the first-level indexes can be finally summarized into the four evaluation elements of the CIPP evaluation model.

2.1   The selection of practical indexes of the evaluation system

Literature research indexes were selected by searching for core journals, journals and papers with high citation rates that were related to the topic and established an evaluation index system. Through the open coding of the literature by NVivo software, the obtained reference points are condensed into the three-level indexes in the research system, and about 49 indexes are obtained. Similarly, the open coding of relevant policy texts on the official website of the Ministry of Education of the People 's Republic of China was also carried out, and 21 three-level indexes were obtained.

On the basis of literature and policy coding, in-depth interviews with teachers and students of practical teaching in higher vocational colleges are conducted to supplement the indexes obtained by the first two methods, and newer evaluation observation points are obtained, which makes the acquisition of evaluation system indexes more comprehensive and scientific. The NVivo software was used to encode and extract the content of the interview text, and 19 three-level indexes were obtained.

In the process of summarizing and sorting out, the repeated indexes are deleted, and the indexes with similar concepts are merged and refined. Based on the four evaluation elements in the CIPP evaluation model, the evaluation indexes are classified according to different evaluation subjects (teachers and students), and the index dimension structure of teacher evaluation and student evaluation is preliminarily obtained.

2.2   Delphi method to revise the evaluation elements

In order to test the rationality of the evaluation system selected above, the selected indexes are revised by Delphi method.

The Delphi expert method is usually composed of several authoritative experts in related fields. The more experts selected, the more conducive to the construction of the evaluation system, which can reduce the error of the expert group 's score on the evaluation system [7]. A total of two rounds of expert consultation were adopted in the study. The first round of expert consultation mainly collected the opinions and suggestions of the expert group on the elements of the evaluation system and the ra-

tionality and feasibility of its description. [8]. According to expert opinions, merge, increase, decrease, and modify relevant indexes. For example, in order to express the accuracy, the ' effectiveness of the practical teaching plan ' indicator is changed to ' practical teaching plan reaches the expected level ', and ' sufficient training materials ' is changed to ' quality of practical teaching materials '. The evaluation index of the consistency between practical teaching and work position is supplemented.

Based on the above analysis, on the basis of expert consultation, the evaluation system of teacher evaluation and student evaluation index of practical teaching quality in higher vocational colleges is finally formed.

Based on the above analysis, on the basis of expert consultation, the evaluation index system of teachers and students in higher vocational practical teaching quality is finally formed. The teacher evaluation index system includes 4 first-level indexes, 12 second-level indexes and 31third-level indexes (Table 1). The student evaluation index system includes 4 first-level indexes, 8 second-level indexes and 20 third-level indexes (Table 2).

Table 1. Teacher evaluation index of practical teaching quality in higher vocational colleges

Three-level indexes	Two-level indexes	One-level indexes
Talent training mode (A-1-1)	Teaching program (A-1)	Practice teaching context evaluation (A)
Talent training objective (A-1-2)		
Expected level of teaching plan (A-1-3)		
Education positioning (A-2-1)	Development orientation (A-2)	
Educational philosophy (A-2-2)		
Proportion of practice class hours (A-3-1)	Curriculum provision (A-3)	
Career orientation (A-3-2)		
Practice teaching plan (A-3-3)		
Teaching project design (A-3-4)		
Personnel allocation (B-1-1)	Teaching staff construction (B-1)	Practice teaching input evaluation (B)
Teachers training (B-1-2)		
Number and type of facilities and equipment (B-2-1)	Practice Teaching Facilities Equipment (B-2)	
Equipment quality (B-2-2)		
Utilization rate of equipment (B-2-3)		
Practical teaching fund (B-3-1)	Practical teaching guarantee (B-3)	
Regulatory agency (B-3-2)		
Regulatory regime (B-3-3)		
Teaching mode (C-1-1)	Practical teaching method (C-1)	Practice teaching process evaluation (C)
Learning style (C-1-2)		
Assessment program (C-2-1)	Practice teaching assessment (C-2)	
Assessment weight (C-2-2)		
Reform of evaluation mode (C-3-1)	Practice teaching reform and innovation (C-3)	
Exploration of practice location (C-3-2)		
Teaching method reform (C-3-3)		
Practical work attitude (D-1-1)	Student participation (D-1)	Practice teaching product evaluation (D)
Process coordination degree(D-1-2)		
Evaluation of practical works(D-1-3)		

Student comprehensive ability (D-2-1)	Student comprehensive ability and quality (D-2)	
Student comprehensive quality (D-2-2)		
Professional practical ability (D-3-1)	Degree of enterprise approval (D-3)	
Enterprise compatibility (D-3-2)		

Table 2. Student evaluation index of practical teaching quality in higher vocational colleges

Three-level indexes	Two-level indexes	One-level indexes
Teaching attitudes and concepts (a-1-1)	Practice teaching idea (a-1)	Practice teaching context evaluation (a)
Practical teaching objective (a-1-2)		
Teachers ' ability and quality (a-1-3)		
Teachers ' professional dedication in practical teaching (a-2-1)	Practical teaching quality (a-2)	
Practice teaching safety awareness (a-2-2)		
School 's emphasis on practical equipment (b-1-1)	Practice teaching facilities equipment (b-1)	Practice teaching input evaluation (b)
Feelings of using equipment (b-1-2)		
Completeness of equipment (b-1-3)		
Quality of practical teaching materials (b-2-1)	Practical teaching materials (b-2)	
Practicality of practical teaching materials (b-2-2)		
Teachers ' teaching preparation (c-1-1)	Teaching process (c-1)	Practice teaching process evaluation (c)
Practice teaching content (c-1-2)		
Teaching summary (c-1-3)		
Supervision of practical teaching (c-2-1)	Practice teaching management (c-2)	
Practice teaching assessment (c-2-2)		
Influence on students ' cognition (d-1-1)	Influence of practical teaching on students (d-1)	Practice teaching product evaluation (d)
Influence on students ' ability (d-1-2)		
Interest in practical teaching (d-2-1)	Students ' learning satisfaction in practical activities (d-2)	
Teachers ' guidance of practical activities (d-2-2)		
Consistency with jobs (d-2-3)		

3 The weight analysis of practical teaching evaluation system

According to the analysis and calculation process of analytic hierarchy process [9], using the hierarchical structure diagram of the previous two evaluation systems, the expert weight consultation questionnaire for the comparison between each two of the indexes at all levels is constructed. The experts score the importance of each two of the first-level, second-level and third-level indexes in the evaluation system, and then construct the judgment matrix between these evaluation indexes according to the obtained importance scores. Consistency test was performed on the judgment matrix, CR=CI/RI, and CR<0.1 was calculated, and the consistency test was passed [10]. Due to the limitation of space, the judgment matrix and the weight of the three-level index are not presented here.

Using the analytic hierarchy process, based on the calculation of the weight assignment of the experts, the final weight result is obtained, as shown in Table 3. The evaluation system of practical teaching in higher vocational colleges is expressed:

0.1124×context evaluation + 0.2239×input evaluation + 0.3189×process evaluation + 0.3448×product evaluation

Table 3. Index weight of teacher and student evaluation system

The index weight of teacher evaluation system		The index weight of student evaluation system	
First-level index weight	Second-level index weight	First-level index weight	Second-level index weight
Context evaluation (0.1124)	Teaching program (0.0312)	Context evaluation (0.1124)	Practice teaching idea (0.0209)
	Development orientation (0.0610)		Practical teaching quality (0.0915)
	Curriculum provision (0.0202)		
Input evaluation (0.2239)	Teaching staff construction (0.0952)	Input evaluation (0.2239)	Practice teaching facilities equipment (0.1213)
	Practice Teaching Facilities Equipment (0.0505)		Practical teaching materials (0.1026)
	Practical teaching guarantee (0.0782)		
Process evaluation (0.3189)	Practical teaching method (0.1156)	Process evaluation (0.3189)	Teaching process (0.1645)
	Practice teaching assessment (0. 0898)		Practice teaching management (0.1544)
	Practice teaching reform and innovation (0. 1135)		
Product evaluation (0.3448)	Student participation (0.0895)	Product evaluation (0.3448)	Influence of practical teaching on students (0.2067)
	Student comprehensive ability and quality (0.1203)		Students ' learning satisfaction in practical activities (0.1381)
	Degree of enterprise approval (0.1350)		

4   The weight analysis of the evaluation system of practical teaching

4.1   First-level index weight analysis

1. Among the four first-level indexes, the weight value of the product evaluation (0.3448) is the highest. The evaluation of the quality of teaching is largely directly reflected by the teaching results, and the highest weight value is reasonable.

2. The process evaluation (0.3189) is the same as the product evaluation, and the weight value is greater than 30 %. In the process of practice, the organization and management of teachers have a great influence on the quality of practical teaching, and the result of practice is based on the realization of process.
3. The weight values of context evaluation (0.1124) and input evaluation (0.2239) are low. At present, many higher vocational colleges are increasing their attention and investment in practical teaching, but not only the concept, positioning and teaching investment, but more importantly, the concept and materials are put into real use, so as to achieve better practical teaching quality. Therefore, the weight value of the two indicators of context evaluation and input evaluation is reasonable.

4.2   Second-level index weight analysis

1. The development orientation is the top-level design of the school and the overall planning of the teaching tasks. Therefore, the weight of the development orientation (0.0610) is significantly higher than that of the teaching plan (0.0312).
2. The construction of teachers ' team greatly affects the quality of practical teaching. In the second-level indexes of input evaluation, the highest weight (0.0952) of the teaching staff construction index is reasonable.
3. The weights of practice teaching method (0.1156) and practice teaching reform and innovation (0.1135) are higher in process evaluation. The teaching process must adopt different methods according to different teaching contents and objects. The methods and contents also need to be constantly reformed and innovated in order to adapt to the development of the times.
4. In the process evaluation of students, the weight values of teaching process (0.1645) and teaching management (0.1544) are similar and very important. The richness of content, the rhythm of teaching, and the acceptability of students all have a significant impact on the quality of practical teaching.
5. In the product evaluation, the degree of enterprise approval (0.1350) is the highest weight value, which is an important symbol to evaluate the development of higher vocational education. Students can adapt to the operation of enterprises, indicating that the results of practical teaching quality are in line with standards.

5   Conclusions

Based on the CIPP model, this study uses NVivo software to select indexes for effective data, and refers to expert opinions to construct a practical teaching evaluation system for higher vocational colleges. Delphi method and analytic hierarchy process are used to modify, optimize and weight the index system, and finally the evaluation system of teachers and students is formed.

Through the analysis, we should attach importance to the evaluation of the school 's development orientation, improve the weight of teacher training and experience, attach importance to the weight of practical teaching methods and contents in the evaluation system, and enhance the evaluation of the impact of enterprises on the transformation of students ' professional practical ability. The evaluation index system

constructed by this analysis can provide some reference for the evaluation of practical teaching in higher vocational colleges.

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