

Research on the Professional Development and Innovation Path of Teachers in Higher Vocational Colleges

Taking Typical Vocational College in Chongqing as an Example*

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Abstract—Professional development of teachers in higher vocational colleges is the core "soft resource" of strategic development in higher vocational colleges. Taking the typical higher vocational colleges in Chongqing as the research object, this paper investigates the professional development of teachers for the diagnosis and improvement work in its teaching operation. Through the analysis of the data collected in the survey, the author analyzes the professional development and innovation of teachers in higher vocational colleges from the perspective of diagnosis and improvement; and then further explores it to build innovative paths for professional development of vocational college teachers from the perspective of diagnosis and improvement. It can be seen from the analysis of the professional development of teachers in higher vocational colleges from "primary teacher to expert teacher" cannot be separated from the continuous and in-depth promotion of diagnosis and improvement.

Keywords: *higher vocational colleges, professional development of teachers, innovation path*

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I. INTRODUCTION

A strong teacher team is the core "soft resource" supporting the strategic development of higher vocational colleges. The connotation construction of "soft resources" is to improve the construction of the teaching staff in higher vocational colleges. The key to improving the overall level of the teaching team is to change the trajectory of professional development of vocational teachers so as to improve the quality of higher vocational education.

II. LITERATURE REVIEW

Many scholars have researched the concept and definition of professional development of the teachers. Liu Fang (2016) proposed that professional development of teachers is a type of professional specialization. Teachers acquire professional knowledge and skills in education through life-long professional training throughout their careers, relying on professional organizations [1]. The professional development of teachers is a dynamic trajectory of teachers' implementation of professional autonomy, performance of professional ethics, and improvement of their teaching quality. Duan Jun (2019) and Li Yunmei (2017) believe that the professional development of teachers in higher vocational colleges refers to the process that teachers in higher vocational colleges, with the help of various organizations and institutions, constantly improve their professional knowledge, improve their academic level and quality, consciously learn by themselves, improve their cognition of their own educational behaviors and change their educational behaviors and habits in education, scientific research and practical activities [2] [3]. The professional development of teachers in higher vocational colleges is

infiltrated into all teaching and research practice activities. The internal organizational structure of higher vocational colleges supervises the process of teachers' change in educational cognition, and promotes the change of "passive growth → active growth" of teachers to achieve the goal of becoming a good educator. Huang Jintang (2016) divides the professional development of vocational college teachers into dynamic and static perspectives. From a dynamic perspective, the professional development of vocational college teachers is the development process of lifelong learning, constant renewal and eventual growth of teachers into professionals [4]. From a static perspective, it refers to the development results of vocational specialization of teachers in vocational colleges through vocational qualification certification. From the static and dynamic perspectives, the professional development process of teachers from "being new to being qualified, from being qualified to being mature, from being mature to being senior" is completed. The combination of static and dynamic constitutes the professional development of teachers in vocational colleges.

To sum up, the professional development of teachers in vocational colleges refers to the process that in the entire career, teachers take the dual goals of improving professional knowledge and teaching quality. Relying on professional organization management (supervision), teachers' professional knowledge and teaching accomplishment change through continuous stimulation and training, in which teachers actively acquire professional knowledge and teaching accomplishment and achieve passive growth to active growth. The change of teachers' "internalized teaching literacy + explicit professional knowledge" constitutes the professional development of teachers in higher vocational colleges. Therefore, the professional development of teachers in higher vocational colleges is a combination of static and

dynamic processes that rely on professional organizations to stimulate and train teachers. At present, the diagnosis and improvement being carried out in higher vocational colleges is a specific application of the combined process of static and dynamic.

III. EMPIRICAL ANALYSIS OF PROFESSIONAL DEVELOPMENT OF TEACHERS IN HIGHER VOCATIONAL COLLEGES FROM THE PERSPECTIVE OF DIAGNOSIS AND IMPROVEMENT

A. Research objects

This paper takes two vocational colleges, such as Chongqing College of Electronic Engineering and Chongqing City Management College, as the research objects. The criteria for selecting the above two higher vocational colleges are as follows. First, Chongqing Electronic Engineering Vocational College is a national demonstration higher vocational college, and Chongqing City Management Vocational College is a national backbone higher vocational college. It has strong regional (even national) influence. So it is typical. Second, the two higher vocational colleges are public colleges, and the opinions and guidance of the Ministry of Education (City Education Commission) can actively respond to and comply with them. Thirdly, both higher vocational colleges are undergoing diagnosis and improvement in higher vocational colleges, so tapping them is representative of the professional development of teachers in the implementation of diagnosis and improvement Based on typicality and representativeness, it conforms to the "number one and two" principle satisfied by the multi-case study proposed by Jack Welch. In summary, the criteria for selecting typical vocational colleges are shown in "Table I".

TABLE I. CRITERIA FOR SELECTING TYPICAL VOCATIONAL COLLEGES

Name	Selection criteria	Diagnosis and improvement Features	Competent authority	Influence	characteristics of running schools	Is it typical
Chongqing College of Electronic Engineering		Independently developing the school diagnosis and improvement platform and successfully implementing the diagnosis and improvement	Municipal Education Commission	National demonstration Vocational College	Electronic Information	Yes
Chongqing City Management College		Use the diagnosis and improvement platform to implement the diagnosis and improvement	Municipal Education Commission	National backbone Vocational College	economic management	Yes

^a Note: The above information was compiled by the author.

B. Research process (three-level coding)

1) Data collection

Using grounded coding, case analysis (construction) places particular emphasis on the central position of diverse data [5]. Therefore, in order to obtain diversified data, the research team surveyed two vocational colleges several times during 2018.3-2019. During the survey, first-hand information was obtained mainly through listening to lectures, informal communication with middle-level cadres (backbone teachers), and consulting internal college data.

Through collecting media reports, official website news, and survey reports from third-party evaluation agencies, etc., a total of 107 copies of second-hand materials were obtained. After screening and sorting, 79 copies of the original data were directly or indirectly useful, with an effective rate of 73.8%. The data is derived from the three perspectives of internal information, industry information, and researchers' observations, so they meet the triangulation standard of case studies [6], thereby ensuring the reliability of multiple case studies.

2) *Grounded analysis and research findings*

The data is constructed according to the standardized process of grounded theory, that is, three-level coding. First-level coding is open coding. When the validity and reliability

are met, nearly 150 of initial concepts are sorted out. The subjective orientation and subjective tendencies are excluded, and the data will be open-coded and refined from the initial category, as shown in "Table II".

TABLE II. FIRST-LEVEL CODING AND INITIAL CATEGORY REFINEMENT

Category	Phenomenon (initial concept)
Professional competence	A3 mainly recruits postgraduates graduated from electronic information majors; A17 gives priority to those who have information professional qualification certificate and relevant enterprise work experience.
	B10 mainly recruits postgraduate students majoring in economic management; B17 gives priority to those who have experience in business management.
Teaching skills	A20 "Classroom teaching should start with typical case analysis"; A23 academic evaluation of teaching and learning will be used as an indicator of teaching assessment; A40 encourages teachers to participate in the creation of "golden classes".
	B23 advocates the teaching method of "theory + practice" to attract students to look up; B29 uses "online and offline" mixed teaching method to improve students' sense of classroom gain.
Practical ability	A35 customized plan encourages teachers to stay in the company for 6 months each year to exercise their practical ability; A47 teaching units and industry leaders jointly build corporate universities; A52 hires industry experts to give lectures to teachers in schools.
	B36 establishes an order-based training model with well-known companies (let companies come in and teachers go out); B45 supports capable teachers to hold part-time management positions in the company; B51 hires well-known enterprise executives to come to the school as guest professors.
Scientific Research Ability	A29 revises scientific research management and reward methods to stimulate teachers' passion for scientific research and creation; A42 invites professors from top universities to give lectures on the application of scientific research projects; A54 and undergraduate joint apply for national research projects; A61 establishes an academician workstation.
	B53 employs journal editors to guide the writing of scientific research papers; B62 establishes a scientific research assistance mechanism of "the old supporting the new".
Creativity	A74 departments at second-level actively encourage teachers to apply for invention patents to stimulate teachers' technological innovation; A79 administrative departments absorb teachers' suggestions (professors) for management systems and encourage teachers to contribute their individual abilities for system innovation.
	B73 teaching unit revise performance to encourage teachers to innovate in teaching and scientific research creation; B81 departments set up "brainstorming" teaching activities to absorb various innovative ideas.
Professional belief	A85 constantly recognizes their career, and helps young teacher grow up; A93 contributes to industry standards (participates in the formulation of industry standards);
	B87 makes a keynote speech at the industry conference, and at the same time promotes opinions (ideas); B101 provides suggestions for governments at all levels and prepares for the think tank.
Supervision and early warning	A128 uses the smart campus platform to constantly monitor the indicators set by the teacher (supervision mechanism); A153 when the indicators are not completed, the smart campus platform stimulates the early warning mechanism; A163 double 8-character (up and down) spiral mechanism is the core of diagnosis and improvement.
	B130 uses the diagnosis and improvement system to establish a supervision mechanism to supervise the completion of the indicators set by the teachers; B157 uses the diagnosis and improvement system to remind teachers to be active; B164 up-down spiral operation will promote the development of the diagnosis and improvement.

^a Note: Group A is coded as the original data of Chongqing College of Electronic Engineering, and Group B is coded as the original data of Chongqing City Management College. The table uses coded content that is retained and excerpted based on the mutual inspection of primary and secondary data. Due to limited space, only a part of the code is selected for interception.

The second-level coding is based on the first-level coding, and continues to explore the internal logical relationship between categories to extract a number of main categories, that is, spindle-type coding. According to the analysis results, the main-line coding of this paper extracts 5 main categories and 7 corresponding sub-categories, and summarizes the subordinate relationships between the main categories and sub-categories, as shown in Table 3. On this basis, the internal logic of the samples in the professional development of teachers in vocational colleges based on the perspective of diagnosis and improvement is extracted, that is, the internal correlation between the diagnosis and improvement, teacher skills and teacher professional development. The internal logical path between the main category and the sub-category is as follows: "diagnosis and improvement work → teacher

ability → teacher skills → teacher professional development".

TABLE III. SECONDARY CODES AND MAIN CATEGORIES REFINEMENT

Category	Main categories	Corresponding category	Category connotation
Teacher professional development	basic skills	Professional ability	The teachers enter the school based on pre-employment professional knowledge. Having professional ability, is the basic skill of teachers.
	upgrade skill	teaching skills	After entering the post, teachers begin to accumulate teaching experience and actively participate in various cooperation between schools and enterprises based on professional abilities. They have a certain teaching ability and practical ability, and the basic skills of teachers are transformed into the upgrading of teacher skills.
		Practical ability	
	Literacy skill	Scientific Research Ability	After knowing a certain teaching ability and practical ability, the author discovered the existing shortcomings. The author looks forward to exploring and solving problems through scientific research norms. Scientific research ability is an important expression of teachers' quality skills.
Innovation skill	Creativity	With teaching, practice, and scientific research capabilities, teachers have recognized majors and even industries, and innovation capabilities have emerged. Based on innovation capabilities, teachers' innovation gains industry recognition and becomes industry experts. The title of industry expert will stimulate teachers to form their professional beliefs. Formation of teachers' innovative skills	
	Professional belief		
Diagnosis	Supervision skill	Supervision and early warning	According to the goals proposed by the teachers themselves, the diagnosis and improvement information platform will take time as the node to monitor, remind and warn the teachers' various goals. According to the supervision, reminding and early warning, the teachers' various abilities are acquired, and the continuous improvement of teachers' skills is finally realized.

^a Note: The above information is based on grounded analysis.

Third-level coding aims to repeatedly refine and summarize the logical relationship between the main categories presented in the second-level coding process, that is, selective coding. By repeatedly straightening out the logical relationship between the main categories, the core category that this article explores and refines is the

mechanism of "professional and innovative creation of vocational teachers based on the perspective of diagnosis and reform". It determines the "cue chain", that is, the logical relationship between the main categories and the internal mechanism relationship between the main categories, are shown in "Table IV".

TABLE IV. THIRD-LEVEL CODING AND CATEGORY MECHANISM REFINING

Category mechanism		Mechanism connotation	
Diagnosis	Supervision skills → Teachers' professional competence	Teacher professional development	Supervision and early warning often remind teachers to exercise their abilities, striving to become a qualified junior teacher.
	Supervision skills → Teacher upgrade skills		During supervision and early warning, teachers improve their abilities and strive to become a backbone teacher (double-teacher).
	Supervision Skills → Teacher Literacy Skills		In supervision and early warning, teachers develop their own literacy skills, and strive to become an outstanding teacher while continuously improving their professional titles.
	Supervision Skills → Teacher Innovative Skills		Teachers develop their own innovative skills in supervision and early warning, have a certain reputation in the industry or professional field, and strive to become an expert teacher.

^a Note: The above information is based on grounded analysis.

IV. RESEARCH ON THE INNOVATION PATH OF TEACHERS' PROFESSIONAL DEVELOPMENT IN HIGHER VOCATIONAL COLLEGES FROM THE PERSPECTIVE OF DIAGNOSIS AND IMPROVEMENT

A. Research on the professional development and innovation of teachers in higher vocational colleges from the perspective of diagnosis and reform

From the conclusion of the above-mentioned grounded analysis, it can be known that the technical level of teachers

in higher vocational colleges is mainly composed of 6 dimensions: professional ability, teaching ability, practical ability, scientific research ability, innovation ability and professional belief ability. The development trajectory of teacher in higher vocational colleges can be divided into four stages: being teachers, backbone teachers, outstanding teachers and expert teachers. The diagnosis and improvement in higher vocational colleges provides guarantee and support for the changes in the ability of teachers and the improvement of the professional level. The diagnosis and improvement is based on the teachers' customized goals at different stages, and the diagnostic information platform is

used to monitor the daily teaching work. When the goals are achieved, the teacher's ability is improved. When the goals are not reached, the diagnostic information platform gives an early warning. The professional development of teachers is affected by the teachers' skills and diagnosis and improvement. The skill level of teachers is affected by the dimensions of the teacher's professional level. The diagnosis and improvement is affected by the monitoring value (early warning value). Further analysis shows that: first, the teacher's skill level is mainly composed of 6 dimensions, as shown in "Fig. 1"; second, teachers at different stages have different skill levels due to their different ability dimensions;

third, at the beginning of the job, teachers just have professional skills, and they have only reached the basic skills of teachers. With the continuous advancement of the diagnosis and improvement, teachers will be monitored and reminded to keep changing their abilities, that is, the skills level of teachers has changed. When teachers have 6 dimensions (with 6 abilities), teachers have innovative skills at this time, and become an expert teacher. Fourth, during the professional development process of teachers from "being teachers to professional teachers", the implementation of diagnosis and improvement has laid a solid foundation for them to ensure the emergence of college masters.

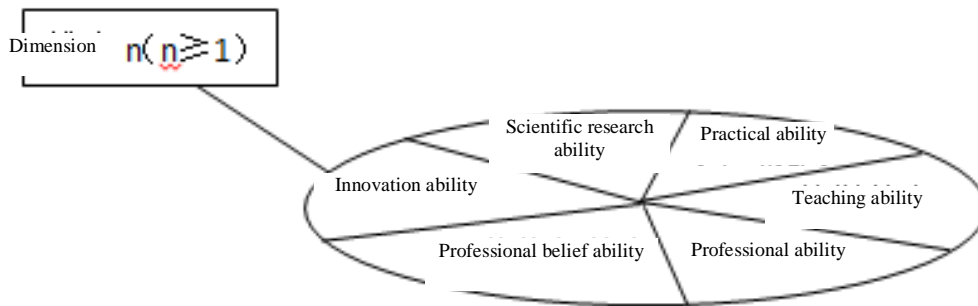


Fig. 1. Six dimensions of teachers' skill level in higher vocational colleges.

B. Construction of innovation path for teachers' professional development in higher vocational colleges

According to the above analysis, the professional development of teachers in higher vocational colleges is closely related to the diagnosis and improvement of higher vocational colleges. The formation of a dual mechanism of lower spiral "internal self-examination" and upper spiral "external overall review" in the diagnosis and improvement of higher vocational colleges will form an endogenous motivation and external guarantee for the professional development of teachers, and promote the dimension of teacher skills from the "dimension" n "to" "dimension $n + 1$ ". In the formation of teachers' skill level, the teacher's ability dimension is not formed in a single way. There will be integrated development between the teachers' ability dimensions. And the implementation of diagnostic and improvement will provide an effective assessment mechanism for the integrated development ability dimension, namely, self-assessment, application and identification of relevant departments. Based on the dual mechanism of diagnosis and improvement, an innovative path for the professional development of teachers in higher vocational colleges has been established, that is, teachers in higher vocational colleges will realize the trajectory of teacher professional development from "being teachers to professional teachers" in a multi-sector system. The trajectory of teacher professional development under the combined role of teachers will promote teachers to leap to become one of the few "master" teachers in higher vocational colleges, that is, to complete the growth path of teachers at the beginning of employment → professional teachers → masters, and to make positive contributions to the construction of school teachers.

V. CONCLUSION

This article takes two higher vocational colleges as the research objects, and explores the impact of their diagnosis and improvement on the professional development of teachers by taking grounded analysis. This article has refined an innovative model of teachers' professional development, and constructed an innovative path for teachers' professional development based on the perspective of diagnosis and improvement. The innovative mechanism of teacher professional development provides a new path to solve the teacher growth in higher vocational colleges. By tapping the inherent logical relationship between the diagnosis and improvement and the professional development of teachers, it solves the problem of improving the level of teachers in higher vocational colleges. The level of teachers is a key element of the strategic development of higher vocational colleges. However, the research in this paper still has certain limitations. How to further quantify each dimension and the insufficient sample size of the study needs more research by subsequent scholars.

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