

The Analysis of Characteristics of the Professional Development of Water Conservancy Class Teachers

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Abstract

The professional development of teachers in universities and colleges is the important content in teaching staff construction. This paper expounds the connotation of the professional development of the engineering and water conservancy class teachers and analyzes the characteristics of the professional development of the water conservancy class teachers, including five aspects. The paper has a certain reference value for strengthening teaching staff construction in colleges and universities.

Keywords: water conservancy class teachers; professional development; characteristics; ability

1. Introduction

The professional development of university and college teachers has been shared concerns by the society, colleges, universities and teachers. The document “*Several Opinions on Comprehensively Improving the Quality of Higher Education by Chinese Ministry of Education*” made clear that “universities and colleges should plan for implementing activities such as teacher training, teaching consulting and some other projects in order to enhance the professional level and teaching ability of middle-aged and young teachers”. On the one hand, learning from

the research results of the professional development theory of foreign teachers and their accompanied practical experiences [1,2], the domestic scholars from different point of view have done the research on the professional development of university and college teachers and achieved many valuable results [3,4]. This paper analyses the characteristics of the professional development of water conservancy class teachers in order to lead teachers and water conservancy colleges and universities to seize the opportunity of the development in the water conservancy industry and higher education, so that these schools can give full play to their internal advantage, also arouse the enthusiasm of the Chinese water conservancy class teachers' pursuit of their own development and promote them enhance their scientific research ability continually. Not only can the paper's view have its realistic meaning and reference value for strengthening teaching staff construction in water conservancy colleges and universities, but also can provide some useful reference for other teachers' growth and development.

2. The connotation of the professional development of engineering course teachers

In China, universities and colleges have four major functions—training talents, doing scientific research, serving society,

innovating and inheriting cultures. Teachers in colleges and universities become the core of the four major functions. Learning from the domestic scholars' study of the connotation of university and college teachers' professional development [5], the author of the paper thought the connotation of engineering course teachers should include teachers' professional ethics, professional knowledge and professional ability. The connotation shows the development process during which an engineering course teacher can mature himself from different aspects, for example, enhancing scientific research abilities, making accomplishments associated with engineering disciplines teaching. Finally teachers gradually grow themselves from a novice pattern teacher into an expert pattern teacher by his long-term study, reflection and practice.

2.1. Professional ethics

The professional ethics of university and college teachers is the norms of the professional activities and behaviors from the university and college teachers. China's education ministry, China's education, science and culture united organization and China's national health and sports committee formulate "the norms of the higher education teachers' professional ethics", which give the specific and detailed demands from the six parts(patriotic law-abiding , the devotion and loving students, teaching and educating people, rigorous doing scholarly research, serving the society and being exemplary virtue) for building the higher education teachers' professional ethics. Engineering course teachers' professional ethics include engineering ethics, which has become the responsibility, liability, and ethics when they are doing engineering science teaching and research activities. Human engineering activities have the relationship with the survival and development of human beings. From the

perspective of talent training, China's engineering education should cultivate future engineers who have the social responsibility, the right values, and the engineering ethics. Therefore, engineering course teachers in every link of theory teaching and engineering practice must educate students the engineering ethics. The above saying requires these teachers with high quality of engineering ethics. Therefore, for engineering course teachers, engineering ethics is an important part of their professional ethics.

2.2. Professional knowledge

First of all, engineering course teachers should possess solid and deep subject knowledge, not only need to master the development history of the subject and the latest research progress in the field both at home and abroad, but also pay attention to continuously enlarge their own knowledge, to be familiar with related disciplines and interdisciplinary knowledge, to understand the rising and development of strategic emerging industries related to their own discipline. The second, engineering course teachers should have the basic knowledge of engineering education. The basic duty of engineering course teachers is teaching, and therefore they must be familiar with engineering education teaching method, grasp some practical knowledge such as teaching design, course design and understand the characteristics of the engineering students' physical and mental development; they must aim at the students' abilities and interests, analyze specific engineering problems, and integrate relevant engineering discipline knowledge to form effective teaching organization. Finally, engineering course teachers should understand the laws, regulations, policies, systems, technical standards, social values of the relevant projects, and their application fields.

2.3. Professional skills

Engineering course teachers' professional abilities generally include the abilities of discipline study and educating. Discipline study ability refers that the engineering course teacher should master and use the subject's professional knowledge and professional skills, can undertake the task of doing the scientific research, product development and technological innovation, etc in the field, and should have the ability and level to find the knowledge, integrate the technologies and serve the society. Discipline educating ability is the ability of engineering teachers' professional education teaching and ability to undertake teaching task of each link in talent- training, including the abilities of teaching design, teaching organization, teaching research, innovation, engineering practice, teaching resource utilization, etc.

3. The connotation of the professional development of water conservancy class teachers

Water conservancy science is the science of human changing the nature, involves many categories of knowledge, such as natural science, engineering science and social science. According to "*The Catalogue of Degree Awarding and Talent Training Disciplines (2011)*" announced by Academic Degrees Committee of The State Council and Education Ministry, "Water conservancy project" is the first-class discipline under the categories of engineering disciplines, including five second-class disciplines— hydrology and water resources, hydraulics and river dynamics, hydraulic structure engineering, water conservancy and hydropower engineering, port, coastal and offshore engineering. In "*The Catalogues of Majors for Undergraduate Students in Common Colleges and Universities (2012)*" issued by

the education ministry, "water conservancy" undergraduate majors are equipped with three majors: water resources and hydropower engineering, hydrology and water resources engineering, port channel and coastal engineering. In the narrow sense, water conservancy class teacher is the professional teacher engaged in the teaching and scientific research of disciplines.

Reference to the connotation of the professional development of engineering course teachers, the connotation of the professional development of water conservancy class teachers refers that in professional teaching and research activities, the water conservancy class teacher can mature himself from different aspects by his long-term continuous learning, reflection and practice, so he can be well qualified to do talent training, scientific research ,engineering practice, and some other relevant work in the field of water conservancy. Finally teachers gradually grow themselves from a novice pattern teacher into an expert pattern teacher.

4. The characteristics of the professional development of water conservancy class teachers

4.1. The subjectivity of water conservancy class teachers

From the perspective of educational psychology, a teacher's self development, self motivation, self fulfillment have become the most important factors in the potential excavation, thus water conservancy class teachers' professional development should focus on how to make teachers' subjective consciousness come into play; also it should emphasis that the essence of a teacher's professional development is the process of a teacher's self-improvement, self-realization, self-transcendence, also a process of a teacher's active and dynamic building the charac-

teristics of his professional quality when he sees himself as a main body consciousness. This requires water conservancy class teachers giving full play to independent study, action-reflection, and cooperative research in the practice of the teaching and scientific research, especially finding and thinking problems in water conservancy science and teaching practice in order to improve his teaching and research abilities in water conservancy science and engineering education.

4.2. The industrial nature of the development approach

Each subject in water conservancy discipline refers to extensive basic professional knowledge involving the study of surveying and mapping, geology, meteorology, geography, ecology, mechanics, as well as economics, management science, environmental science and many other kinds of knowledge, and thus demands high quality professional teachers. The professional development of water conservancy class teachers should be adapted to the needs of talents training in the water conservancy, which should guide the teachers to love teaching work, to lay stress on engineering practice, to cultivate innovative talents; the development should correspond to the development trend of a water conservancy science and guide teachers to carry out kinds of scientific researches such as the basic scientific research on the water conservancy, the research on the technology integration, the research on the combination of the water conservancy disciplines and related disciplines; meanwhile teachers should be guided to use the related new and advanced technology skillfully, and be cultivated the ability of solving the key technical problems in major projects; the development should also be adapted to the world's advanced water conservancy science and technology; it should lead teachers to participate in international ac-

ademic exchanges and engineering technical consultations in order to broaden their international horizon and improve their ability of intercultural communication.

4.3. The stages of the development process

Referring to the periodic theory of teacher's professional development, water conservancy class teachers' career can be roughly divided into four stages: novice teachers, qualified teachers, mature teachers and expert teachers. For novice teachers, they can't give themselves the accurate position of the teaching roles and can't completely understand teachers' work enough; they can't combine their subject knowledge with the teaching skills effectively. Thus, they should be firstly cultivated the abilities of teaching design, teaching organization, teaching reflection, and they should be enriched the knowledge in water conservancy discipline and they should learn how to strengthen their professional education teaching effect. For qualified teachers and mature teachers, they are not only the backbone of the teaching, but also the main pillars of the scientific research; they have a solid theoretical foundation, have accumulated rich professional experience in teaching and scientific research work, and have the pursuit of becoming expert teachers, so they should focus on developing team spirit, especially promoting industry-study-research cooperation and engineering practice, sharing teaching knowledge and scientific research experience so as to play the role of "connecting link" among teachers. Expert teachers' teaching ability, research ability, teaching management ability and engineering practice ability have reached the advanced level among teachers and they can play a leading, dominant and decision-making role in the teaching and scientific research, therefore they should

make the key point to summarize and promote education teaching wisdom, mainly to lead and guide the teaching team, scientific research team to the healthy development; they should know how to give effective guidance to help novice teachers' growth and promote the virtuous cycle of teachers' professional development.

4.4. The longevity of development goal

The professional development of teachers is the important content of university teaching staff construction, and also a long-term task. First of all, given combining the goals of water conservancy disciplines' construction with the demand of talents cultivation, universities and colleges need to make a long-term plan for teaching staff construction in water conservancy; considering the scale and structure of teachers, directing at teachers on different stages of development, universities and colleges need to formulate long-term effective mechanism of teachers' professional development and related policies and measures, such as on-the-job training, education promotion, inter-school cooperation, studying abroad, etc., and gradually form the mode of teachers' professional development which has its own school's and the discipline's specialty so that the mode can ensure the longevity and systematicness for teachers' professional development. The second, water conservancy class teachers should build up the idea of lifelong learning and lifelong development, establish ideal of their professional development, and set the goals and strategies of their professional development which can be combined with their own professional development stage. To achieve that, they should do the followings: the first, about enhancing the effect of the professional education and teaching, they should make efforts to improve professional education teaching ability by active participation in series of

school-based trainings, regular teaching reflections, systematic teaching researches and the engineering practices connected with the water conservancy industry; the second, about improving the capacity of water conservancy science research, they should depend on the need of construction of "ecological water conservancy" and "water resources of the people's livelihood" to keep pace with the update knowledge in water conservancy field, to follow the innovation in science and technology and to keep up with the development of water conservancy; they also need to find problems in academic forefront, master the results of the latest research and improve abilities of acquiring information, sharing resources and doing cooperative study so as to enhance the level of scientific research continuously.

4.5. The diversity of development modes

As the new change in the teacher education around the world, the mode of university and college teachers' professional development has show diversity. Requirements and tasks of different modes are not the same; also, the path and focus of modes are very different from each other. According to the goals of the water conservancy class teachers' professional development and their existing practical experience, the modes of the professional development of water conservancy class teachers can be mainly divided into self-fulfilling mode, team-cooperating mode and school-promoting mode. The self-fulfilling mode of the professional development of water conservancy teachers' mainly refers that teachers can improve their teaching work and develop themselves initiatively through the behavior of the self-evaluation and self-reflection on teaching; especially it is very effective for young teachers to improve their professional teaching ability in water conserv-

ancy class. The team-cooperating mode of the professional development of water conservancy class teachers is relying on the key technology platform, major scientific research projects, and key courses (group) teachers can form team to undertake the task of teaching and research; during the process, by team learning, resource sharing, seminars, research methods, the subject study ability and teaching ability of team members' can be enhanced and teachers' cooperative consciousness can be cultivated so it is very useful to form the team-spirit, improve the cooperation ability and promote the professional development of each team member's. The school-promoting mode refers that according to the teaching staff construction plan colleges and universities can adopt some ways (such as the school-based training, industry-study-research cooperation, studying abroad) to improve teachers' professional knowledge and ability. Especially, the industry-study-research cooperation requires universities and colleges having deep cooperation and effective coordination with the key units and organizations in the water conservancy, which achieve the win-win goals of teachers, enterprises, schools and help the professional development of teachers.

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