

Research on the Development of Information-based Teaching Ability of Higher Vocational Teachers Based on ICT-TPACK

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Abstract: At present, information-based teaching has become an important part of teaching reform in China's colleges and universities. It is of great significance to improve teachers' teaching quality and promote teachers' personal development. However, under ICT-TPACK, there are still some problems in Higher Vocational teachers' information-based teaching, such as low participation in practice and insufficient information-based teaching skills. Based on this, this paper expounds the connotation of information-based teaching and information-based teaching ability and other related concepts, and analyzes the existing problems of Higher Vocational teachers' information technology. In addition, it further puts forward some countermeasures, such as establishing the correct information-based teaching concept, improving the existing teaching environment, and formulating a complete incentive policy.

1. Research Background

1.1 Literature review

Pan Bingchao made an investigation and Study on teachers' Informationized Teaching Ability in rural areas of China. The results showed that the improvement of teachers' Informationized Teaching Ability in rural areas needed to make full use of teachers' subjective initiative, establish strong information awareness and actively explore Informationized Teaching Methods (Pan, 2014). Zhao Xueyao and other scholars distributed questionnaires throughout China to investigate the Informationized Teaching Ability of teachers in 23 higher vocational colleges. The results show that the information-based teaching ability of teachers in higher vocational colleges is at a good level as a whole, but in different dimensions, the development of teachers' information-based teaching ability is not coordinated (Zhao et al, 2018). Tang Huiqin takes the information-based teaching mode of teachers in Higher Vocational Colleges as the breakthrough point, studies the information-based teaching ability of teachers in Higher Vocational colleges, analyses the drawbacks of the original teaching mode, and further proposes a new mixed flexible training mode (Tang, 2015). Chen Shumin analyzed the current teaching situation of teachers in Higher Vocational colleges, and believed that teachers in higher vocational colleges must carry out the self-cultivation and improvement of information-based teaching ability. In view of the problems faced by higher vocational teachers' Informationized Teaching ability, this paper puts forward a series of countermeasures (Chen, 2016). On the basis of defining the concept of TPACK, Xu Xuemin analyzed the current situation of Higher Vocational teachers' information-based teaching ability development, and further constructed a new model of TPACK teaching ability training for higher vocational teachers (Xu, 2018). Liu Tao elaborated the characteristics and connotation of information-based teaching, and put forward a series of countermeasures and suggestions (Liu, 2017) to improve the long-term operation mechanism and reform the traditional teaching mode for the improvement of Higher Vocational teachers' information-based teaching ability. Zeng Qinglan analyzed the structure of Higher Vocational teachers' information-based teaching ability, and based on the principles of operability, practicality, comprehensiveness, integrity and goal, established a three-level index evaluation system, which provided a reference for the improvement of Higher Vocational teachers' information-based teaching ability (Zeng, 2017). Liu Jiangzhen put forward that teaching ability is

the core of Higher Vocational teachers'information-based teaching ability. Based on the analysis of the current situation of Higher Vocational teachers'information-based teaching ability, this paper further puts forward the countermeasures to improve higher vocational teachers' information-based teaching ability (Liu, 2019).

1.2 Research purposes

Higher vocational colleges are an important part of Chinese higher education institutions, which occupy a very important position in higher education. As the implementer of education, higher vocational teachers are also a very important link in higher education. The cultivation and promotion of Higher Vocational teachers'informationization teaching ability can effectively promote the process of informationization construction in Higher Vocational colleges, and it is also the endogenous driving force of teaching reform in Higher Vocational colleges. However, under ICT-TPACK, there are still some problems in the development of Higher Vocational teachers'information-based teaching ability. Therefore, based on the relevant concepts, this paper deeply analyses the problems existing in the development of Higher Vocational teachers'information-based teaching ability, and further puts forward the development strategy of Higher Vocational teachers' information-based teaching ability based on ICT-TPACK, in order to provide valuable reference for the improvement of Higher Vocational teachers'information-based teaching ability.

2. Definition of concepts

2.1 Information-based teaching

Information-based teaching is a new type of teaching mode, the main guiding ideology is the modern educational concept. From a conceptual point of view, information-based teaching is actually a kind of teaching activity carried out by learners and teachers with the help of information education resources, teaching media and methods. Information-based teaching is a kind of teaching activity based on information technology between teachers and students, and it is also a teaching activity carried out by teachers and students using modern teaching media. Effective information-based teaching structure is a multi-angle, multi-level three-dimensional structure. This structure consists of internal and external components, which are information-based teaching concept, information-based teaching design and information-based teaching form. In essence, the information-based teaching mode is that teachers use modern technology to construct a better environment and guide students to acquire knowledge and learn information. In other words, information-based teaching means that teachers make full use of the means of information-based teaching to guide students in the teaching process of knowledge construction in a good teaching environment. Therefore, for teachers, the specific performance of information-based teaching ability is information-based teaching.

2.2 Information-based teaching ability

Ability is the basic condition for a person to engage in certain activities smoothly. Therefore, teaching ability is the basic condition for teachers to carry out teaching activities smoothly and effectively impart knowledge to students. Teachers want to teach a course well, and their teaching ability is very important. In the era of information development, teachers'information-based teaching ability is one of the basic conditions that teachers must have in the classroom. Within the framework of TPACK's teachers'knowledge, teachers' Informationized Teaching ability consists of six parts: promoting students'informationized learning ability, Informationized Teaching Cooperation ability, Informationized Teaching Evaluation ability, Informationized Teaching Communication ability, Informationized Teaching integration ability and Informationized Teaching transfer ability. Power. Some scholars believe that teachers'information-based teaching ability mainly consists of five aspects, namely, the implementation of information-based teaching, information concept, information-based teaching design ability, basic information skills and

professional ethics and ethics.

On the basis of combing the previous research literature, this paper redefines the concept of Higher Vocational teachers'information-based teaching ability. This paper divides the information-based teaching ability of higher vocational teachers into five levels: information ethics and morality, information-based teaching reflection and evaluation, information-based teaching implementation ability and information-based teaching design ability. Power and information-based teaching attitude and consciousness. Among them, the implementation ability of information-based teaching can be divided into four levels, namely, the knowledge base of information-based teaching, the application ability of information technology, the implementation ability of information-based teaching design, the ability of information communication and collaboration.

3. Problems in the Development of Higher Vocational Teachers'Information-based Teaching Ability

3.1 Teachers' attitudes and awareness of information-based teaching are higher, but their participation in information-based teaching practice is lower

In the daily teaching activities of teachers in Higher Vocational colleges, teachers'attitudes and teaching awareness towards information-based teaching will have a direct impact on the level of information-based teaching. According to relevant surveys, 86% of teachers believe that the use of information-based teaching methods can significantly improve classroom teaching effect in practical teaching practice. Ninety-five percent of teachers agree that information-based education can improve their professional level in the process of teaching. Fifty-eight percent of teachers are willing to make full use of information-based teaching methods in the actual teaching process, and at the same time, they can apply information-based teaching methods in teaching activities with a positive attitude. From this point of view, higher vocational teachers have a relatively high sense of identity for information-based teaching. However, through the actual investigation, it is found that most of the teachers in Higher Vocational Colleges agree with information-based teaching methods, but in the actual teaching process, they still use traditional teaching methods to teach. The main reason for this contrast is that the daily teaching tasks of higher vocational teachers are relatively heavy, and the research pressure of higher vocational teachers is also in a relatively high state. Therefore, in the actual teaching process, higher vocational teachers do not have extra energy and time to carry out information-based teaching time and teaching design. Among them, especially in the use of information-based teaching resources and information-based teaching tools, higher vocational teachers'participation is lower.

3.2 Higher vocational teachers' information-based teaching skills are shortage

One of the basic conditions for developing information-based teaching is to master some basic knowledge and skills of information-based teaching. According to the results of the questionnaire survey, 89% of the higher vocational teachers agree with the view that informationization teaching is a concrete manifestation of comprehensive teaching quality. This result shows that higher vocational teachers agree that information-based teaching is a kind of accomplishment and skill. However, only half of the teachers chose to identify with the topic of “flexible application of modern multimedia tools and handling some simple faults in practical teaching activities”. Compared with the previous item, the recognition rate of this item is lower. This result shows that nearly half of the teachers in Higher Vocational Colleges lack the basic operation ability of multimedia teaching system. In the survey, the common problem of higher vocational teachers is that there are few training and opportunities for teachers'information-based teaching in Higher Vocational colleges. Therefore, in the actual teaching process, teachers often have no intention to carry out information-based teaching. Most teachers in Higher Vocational Colleges express the hope that the school can provide more training and learning opportunities, and improve the ability and level of teachers'information-based teaching.

3.3 External environment and self-factors restrict the improvement of higher vocational teachers' information-based teaching ability

When conducting relevant investigations, teachers in higher vocational colleges generally believe that the improvement of their Informationized Teaching ability is restricted by both external environment and their own factors. Firstly, the external environment, 55% of teachers believe that their own information-based teaching level is constrained by the external environment. These external factors mainly include the information-based teaching training provided by the school, the basic teaching environment of the school and related policies. Survey data show that among the external environmental constraints, the top constraints are lack of rich information resources, less information-based teaching training, school information-based teaching conditions difficult to meet the actual needs, lack of corresponding incentive mechanism. Secondly, it is their own constraints. In the survey, 45% of higher vocational teachers believe that their information-based teaching ability is due to their own constraints. These factors mainly include their own information-based knowledge reserve, information-based teaching design, their own energy input and the concept of information-based teaching. According to the survey data, among the self-constraints, the leading factors include lack of relevant information-based teaching experience, lack of correct information-based teaching concepts, and lack of sufficient energy and time in information-based teaching.

3.4 Higher vocational teachers' practical ability of information-based teaching is lower

In the teaching ability of teachers, it is a very important content to master the basic skills of information-based teaching and to apply them skillfully in practical teaching activities. In the survey, 29% of higher vocational teachers can not skillfully use information technology such as virtual simulation in actual teaching activities. This result shows that many higher vocational teachers can not skillfully apply information technology such as virtual simulation in teaching practice. Moreover, the survey data show that only about 50% of higher vocational teachers can reasonably use information technology to carry out teaching practice. This shows that nearly half of the higher vocational teachers still can not apply information technology to teaching practice reasonably, and their ability to apply information technology to teaching still needs to be further improved.

4. Development Strategy of Information-based Teaching Ability of Higher Vocational Teachers Based on ICT-TPACK

4.1 Establishing correct information-based teaching concept

Under the framework of ICT-TPACK knowledge, the cultivation and establishment of Higher Vocational teachers' information-based teaching concept is the inherent requirement of information-based teaching. At present, new teaching modes, new concepts and new technologies continue to evolve, which brings new opportunities and challenges to the teaching development of Higher Vocational teachers, and also puts forward new requirements for the existing teaching modes. Therefore, higher vocational teachers should change their traditional education and teaching concepts, establish correct information-based teaching concepts, and constantly improve their ability of information-based teaching. Firstly, higher vocational teachers should establish the concept of mixed learning, take students as the center, and guide students to become the dominant and participants in teaching activities. Secondly, higher vocational teachers should recognize the status and role of information-based education, actively explore new teaching modes such as SPOC, flip classroom, so as to enhance their own information-based teaching ability.

4.2 Improve the existing teaching environment

Higher vocational colleges constantly improve the existing teaching environment, which can provide guarantee for teachers' information-based teaching. Firstly, under ICT-TPACK, higher vocational colleges should constantly improve the construction of school information-based teaching equipment according to the actual teaching conditions and teaching status, such as the

establishment of functional training classrooms, smart classrooms, recording and broadcasting classrooms, etc. Secondly, schools should increase the introduction and construction of high-quality information-based teaching resources, such as guiding teachers to develop information-based teaching resources independently and introducing high-quality digital resources, so as to promote the process of school information-based education and mobilize teachers' enthusiasm for information-based teaching.

4.3 Develop a complete incentive policy

Higher vocational colleges should take improving teachers' Informationized Teaching Ability as a long-term task to achieve, formulate a complete incentive policy, and mobilize teachers' enthusiasm for Informationized Teaching reform. Specifically, higher vocational colleges should formulate corresponding information-based teaching reform measures, including information-based teaching into the evaluation of professional titles, annual assessment, evaluation of awards. At the same time, schools should establish scientific and reasonable evaluation criteria for teachers' Informationized Teaching ability, and increase financial support and incentives to stimulate teachers' enthusiasm and initiative in Informationized Teaching reform.

4.4 Improving the training system of information education in higher vocational colleges

Information-based teaching training for higher vocational teachers is one of the ways to improve teachers' information-based teaching ability. Specifically, higher vocational colleges can set up three levels of teaching training, elementary information-based teaching training, intermediate information-based teaching training and advanced information-based teaching training. Primary training is mainly the training of basic information technology ability, which lays the foundation of information teaching for Higher Vocational teachers. Intermediate training is to train higher vocational teachers' application ability of information-based teaching, including the application ability of SPOC, flip classroom and other information modes. Advanced training is innovative training in information-based teaching. Different training methods can be adopted according to the actual situation, such as inviting experts to hold lectures and so on.

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