

Practical Research on Information-based Teaching Reform Mode in Higher Vocational Colleges

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Abstract: This thesis sorts out the bottleneck problems encountered in the current information-based teaching reform in higher vocational colleges, establishes and runs the information-based teaching reform mode of “two orientations, three levels and four stages” and clarifies the context of information-based teaching in ways that provide time reference for promoting the application of information technology in Higher Vocational Education and creating a new teaching form.

Key words: Higher vocational colleges; Information-based; Teaching reform; Practical research

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With the rapid development of information technology such as Internet and cloud computing, promoting the reform of information-based teaching and changing the teaching form have become an important starting point for higher vocational education to improve the quality of personnel training, serve the industry transformation and social and economic development. *The Outline of the National Medium and Long Term Education Reform and Development Plan (2010-2020)* clearly states that “we must improve the teachers’ training system, deepen the educational reform for teachers, and improve the quality of teachers’ training, especially update teaching concepts, improve teaching methods, and enhance the quality of education and teaching by improving the level of teachers’ capability of adopting information technology.” The Implementation Plan of National Vocational Education

Reform points out that “adapting to the development needs of ‘Internet plus vocational education’ and improving teaching methods by adopting modern information technology”. It can be seen that China vigorously advocates the use of information technology to carry out teaching. They are urgent questions for vocational colleges to answer on how to implement the spirit of documents in the teaching practice of higher vocational colleges, and how to explore the path of information-based teaching reform with the characteristics of Vocational Education in line with the reality of education and teaching in the face of new challenges.

I. The bottleneck problems in the reform of information-based teaching in Higher Vocational Colleges

Information-based teaching is mainly composed of four basic elements: educators, educational information, modern educational media and learners 1. From above four elements, currently, higher vocational colleges in China are facing bottleneck problems in the process of information-based teaching reform:

1. Inadequate overall planning of the college

At present, the main body of information-based teaching reform in higher vocational colleges is majors and courses, which is driven by needs of teachers’ project approval and award-winning. The lack of overall planning, layout, design

and guidance at the college level leads to problems such as mismatch between output and input, serious fragmentation of resources, low quality of resources and idle use of a large number of resources.

2. Imperfect management and operation mechanism

The management system and standards of information-based teaching reform are not perfect, and there is a lack of quality construction standards of teaching resources, evaluation standards of teaching effect, credit recognition standards of students' online learning under the background of information technology. The approval, promotion and supervision mechanism of information-based teaching projects are not perfect. There is a lack of incentive mechanism of co-establishment and sharing for the promotion and application of teaching resources.

3. Insufficient teachers and students' information technology abilities

Teachers are lack of information technology capabilities in online course development, teaching resource production, audio and video recording, animation creation and editing, and also short of information-based teaching organization, design and implementation ability of online and offline hybrid teaching and flipped classroom based on various online resource platforms 2. Students lack systematic information technology literacy based on Internet online learning 3.

4. Low quality of college-based teaching resources

Under the influence of national professional teaching resource database and online open course project, higher vocational colleges fully realize the importance of teaching resource construction, and have a large number of college-based teaching resources. However, there are still serious problems in the quality, such as material fragmentation,

separation from the actual teaching use, and insufficient resource education attributes.

In 2015, Harbin Vocational & Technical College launched the information-based teaching reform in an all-round way. Aiming at the bottleneck problems, it found an effective implementation path for the deep integration of information technology and vocational education teaching. After four years of practice, it summarized the information-based teaching reform mode of "two orientations, three levels and four stages" and achieved good practical results.

II. Information-based teaching reform mode of "two orientations, three levels and four stages" and its implementation

1. The meaning of information teaching reform mode of "two orientations, three levels and four stages"

With the aim of cultivating high-quality technical and skilled talents by means of information technology, a three-level content system of "granular teaching resources, structured online open courses, and integrated professional teaching resources database" will be built for teachers, students and social learners, and a four-stage working mechanism of planning & design, selection & project approval, pilot implementation, and application promotion will be established to effectively promote college information-based teaching reform and adapt to the development needs of "Internet plus vocational education" in a way to create a new teaching form under the background of "Internet plus" and the new era of AI.

2.The implementation of information teaching reform mode of "two orientations, three levels and four stages"

1) Scientific planning and design to find the direction of information-based teaching

We sorted out the problems and causes of information-based teaching practice in the college, benchmarked the basic elements of information-based teaching implementation, formulated the college's "implementation plan on information-based teaching reform", made clear the overall idea of layered promotion and effective cultivation and clarify the construction tasks of annual courses and teaching resources in ways to construct, pilot and promote in an organizing and step-by-step approach. Through the special research, a reform route of investment, unified guidance and steady progress was put forward, which is guided by the National Vocational Education Welding Professional Teaching Resource Library to plan and build professional teaching resource libraries and excellent online open courses at the college level. The college plans to invite bids to design and produce two batches of micro courses every year. Each full-time teacher shall produce at least one excellent micro course every semester. Every year, micro course competition at college level, multimedia courseware competition and information-based teaching competition are organized, and excellent works are recommended to participate in provincial and national competitions to drive the transformation of daily teaching form.

2) Improve the guarantee in an all-round way and clarify the context of information-based teaching

Improve the operation mechanism. We have improved the Management Measures for the Construction and Sharing of Excellent Online Open Courses and the Management Measures for the Construction Project of Professional Teaching Resource Library, and established a standardized information-based teaching system. It is clearly stipulated that the construction period of the teaching resource database at the college level is two years, with an annual support of 200,000 yuan; each supporting fund for the core curriculum reform project at the college level is 20,000 yuan, and that for each excellent online open curriculum at the college level is 30,000 yuan. The funds are used for the production, pilot

implementation and promotion of teaching resources and are strictly in accordance with the financial system.

Increase teachers' training. One is to configure software and hardware. The college and enterprise cooperated to develop the teaching resource base platform, curriculum platform and micro course evaluation platform, which provide software guarantee for the development of information-based teaching reform. The college purchased micro class production equipment for teaching departments in secondary schools, including cameras, video cameras, noise reduction headphones, drawing boards / digital screens, tripods, photography lights, hard disks, special bags, to meet the hardware needs of teachers to produce teaching resources. Second is to strengthen trainings. We set primary, intermediate and advanced information-based trainings and regulate all full-time teachers must pass the primary training; on this basis, the course director must pass the intermediate training, and the leader in charge of specialty must pass the advanced training. After the primary training, teachers can independently complete the production of micro class, animation and other teaching resources; after the intermediate training, teachers can lead the team to develop online open courses; after the advanced training, teachers can lead the team to build professional teaching resource libraries.

3) Deepen the pilot implementation and build a stable information-based teaching system

Take strong guidance. Set up a special research group for curriculum construction, develop and issue normative guidance documents, such as The Guide for Writing the Reform Plan of Professional Core Curriculum, The Guide for Writing the Construction Plan of College Level Professional Teaching Resource Database, The Project Proposal for the Reform Project of Core Curriculum, The Project Proposal for the High Quality Online Open Courses, to guide the project team to do a good job in planning and design; 5-7 well-known professors in the college and enterprise experts form

a demonstration team to provide effective guidance through project demonstration, scheme review, process inspection, in-depth classroom and assistance to help improve, so as to ensure the effective promotion and effectiveness of information-based teaching reform.

Strengthen pilot implementation. The college organizes the construction of college level professional teaching resource database and online open course project approval, gives full play to the role of demonstration group in selection, demonstration, construction, promotion and acceptance, and ensures the implementation of all links. Guided by the application of National Welding and Automation Professional Teaching Resource Library, we integrate information technology into classroom teaching process, student learning process and assessment and evaluation process, design teaching activities such as task driven, independent learning, online communication and real-time assessment, develop teaching organization forms of combination of micro class and face-to-face teaching, independent learning and forum communication to realize the classroom flipping of learning before teaching, thereby improve students' interest and enthusiasm in learning, and enhance the realization of teaching objectives.

4) Powerful application and promotion to tamp the effect of information-based teaching

The college explores and applies a variety of effective strategies to promote the teaching resource bases. Taking the National Welding Professional Teaching Resources Library as an example. First, strengthen the organization and system guarantee, establish the application and promotion group of welding resource library, formulate The Implementation Plan for Application and Promotion of Welding Resource Library and other measures and systems, and promote the implementation of application and promotion. Second, give full play to the role of the alliance, establish a mechanism of resource Co-construction and sharing based on the alliance,

and explore the establishment of credit mutual recognition mechanism within the alliance; By holding more than 10 training meetings on the application and promotion of the resource base, we publicized and promoted the effective application of the resource base. Third, strengthen the application of resource base in daily teaching. Select the pilot class, pilot the implementation of hybrid learning, flipped classroom and other teaching modes, and use the real-time interactive teaching methods in mobile environment such as cloud classroom to increase the stickiness of students and classroom and improve the teaching effect.

III. The achievements of information teaching reform mode of “two orientations, three levels and four stages”

1. The system and standard for the construction of teaching resources at the College level have been formulated

We established and perfected three kinds of teaching resource systems. Firstly, we introduced the college management system, i.e. The Management Measures for College Level Teaching Resource Base and The Management Measures for High Quality Online Open Courses etc., and supervised the whole process of the project from the selection conditions, project approval procedures, fund management and other aspects in an all-round way, and stipulated the functions of the teaching resource management system from the framework system. Secondly, we improved the application, promotion and update system of professional teaching resource base and online open courses, i.e. The Measures for Mutual Recognition of Credits in Alliance Colleges, The Measures for Implementation of Application and Promotion of Resource Base, and The Measures for Implementation of Application and Promotion of Online Open Courses 4, and clearly stipulated the implementation

levels of credit mutual recognition, resource update, application promotion, intellectual property protection, competition and commendation. Thirdly, the technology standards on the quality of seven kinds of resources, such as texts, images, audios, videos, animations and virtual simulations, classification attribute standard and teaching resource evaluation standard are researched and formulated; the hybrid learning, mobile learning supervision mechanism and learning effect evaluation mechanism are researched and formulated to ensure the resource quality from the supervision and evaluation level.

2. The framework system of teaching resource base construction has been formed

The National Welding Professional Teaching Resource Library has set up framework system of four parts, including teaching resource system, teaching management platform, user service space and Internet plus resource database. For teachers, students, enterprise employees and social learners, two versions of PC and mobile App are designed. Under the guidance of the national teaching resources database, the college-level teaching resources database has formed a framework system composed of three parts: specialty, curriculum and resources. The Specialty Center includes a series of normative documents, such as specialty teaching standards, instructive talent training programs, talent training quality assessment standards, etc.; the Curriculum Center presents curriculum system, core curriculum standards, new forms of teaching materials, etc.; the Resource Center carries texts, images, animations, virtual simulations and other resources. A framework system for the construction of national and college level teaching resource bases has been preliminarily formed.

3. High quality teaching resources and online courses have been built

The college has one national welding professional

teaching resource database, 12 college-level teaching resource databases, 21 provincial-level excellent online open courses, nearly 30,000 online resources and more than 20,000 registered users. In the teaching resource database, an instructive talent training program is established, which provides reference for different levels of talent training programs such as undergraduate, higher vocational and technical colleges. The main post professional qualification training programs are customized and developed, and the training resource packages are made. Different courses are set up to meet the teaching needs of different regions and industries. Different granularity resources are provided for teachers to meet the needs of personalized teaching and support the special training needs of enterprises, and to provide personalized training services.

4. Diversified information-based teaching activities have been carried out

The training plans and programs of modern educational technology have been formulated, and the primary, intermediate and advanced trainings related to information-based teaching have been carried out for the teachers in the college. In the past five years, we have carried out rotation trainings on the application ability of information technology for teachers; we have carried out micro class competition, information-based teaching competition and multimedia courseware competition in the college every year; and we have included the award-winning situation of teachers into the appraisal and employment evaluation index system. Through training, competition and other ways, the level of teachers' teaching informatization level has been greatly improved.

The information-based teaching reform mode of "two orientations, three levels and four stages" solves the problem of overall planning at the college level of information-based teaching reform in higher vocational colleges, constructs the information-based teaching application and promotion system

and guarantee system, enhances teachers' information- based teaching ability, forms the college-based resource quality standard system, and puts forward an effective way to create a new form of information technology teaching.

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