

Research on Modular Curriculum Construction and Teaching Model in Higher Vocational Education under OBE Concept

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Abstract

The Outcome -Based Education (OBE) teaching mode breaks the traditional "teacher-centered" and "knowledge system-oriented" mode, emphasizes the students' dominant position, and realizes the fundamental transformation of teaching paradigm from "content-based" to "student-based". In recent years, OBE mode has played an important role in promoting the reform of engineering education and improving the quality of engineering talent training, and has become the focus of engineering colleges. In order to make the education of big data technology specialty in higher vocational colleges closely connect with local industries, meet the employment needs of social enterprises, and train students to adapt to social posts more quickly, we discusses the course construction path of project-based and modular teaching, and explores the modular course teaching mode applicable to big data technology specialty based on the school-enterprise cooperation platform. Through the course teaching reform and practice, students can apply what they have learned. It improves their interest and enthusiasm in learning, and enables students majoring in big data technology to better grasp the research and development achievements and the latest technology closely combined with production practice, so as to improve their employment competitiveness.

Keywords

Outcome -Based Education, Modularization, Curriculum Construction, Teaching Mode.

1. Introduction

Outcome-Based Education (OBE) reversely designs the curriculum system based on the final learning outcomes expected by students. The OBE teaching mode breaks the traditional "teacher-centered" and "knowledge system-oriented" mode, emphasizes the student's dominant position, and realizes the fundamental transformation of teaching paradigm from "content-based" to "student-based". The concept of OBE mode adapts to the needs of society, especially enterprises for talents, that is, students' skills and abilities are presented in observable, measurable and applicable modes [1].

At present, most of China's higher education system adopts the discipline-oriented education mode, and trains talents in accordance with the teaching syllabus of various majors and courses, which is easy to cause the lack of personalization and the gradual homogenization of talent training mode. OBE mode nowadays has played an important role in promoting the reform of engineering education and improving the quality of engineering talent training, and has become the focus of engineering colleges and universities [2].

At present, China attaches great importance to the development of big data and comprehensively implements the national big data strategy. It is estimated that by 2025, China's demand for big data talents will reach 2 million. There is a huge gap between the supply and demand of big data talents. The education of big data technology in higher vocational colleges needs to be closely connected with local industries, meet the employment needs of

social enterprises, and enable graduates to adapt to social posts faster after entering the society. The training of big data analysis ability should give simulation teaching atmosphere and environment as much as possible to promote the implementation of teaching planning [3]. In order to improve the close connection between big data talent training and enterprise post capabilities, it is necessary to introduce OBE mode.

Based on the practical needs and existing problems, this paper aims at cultivating high-level skilled data analysis talents, taking the "Big Data Analysis Technology" course of "high starting point planning, high quality construction, and sustainable improvement" as an example [4]. Based on the school-enterprise cooperation platform, the dual sides jointly explore the course construction path of project-based and modular teaching, and explore the modular course teaching mode applicable to the major of big data technology.

2. Research State and Future Development Tendency

With the arrival of the big data era, it is urgent for colleges and universities to establish the big data analysis curriculum system in time to cultivate and transport a large number of talents with big data professional quality for the society, so as to meet the growing demand of the society for big data talents. However, courses related to data analysis are mainly aimed at ordinary undergraduates and above, focusing on theoretical explanation and abstract content, which do not meet the needs of higher vocational education. The major of big data in higher vocational colleges should absorb advanced foreign vocational teaching experience, strengthen international exchanges, and combine regional characteristics and industrial development models to create regional and even national benchmarks.

2.1. School-enterprise combination and industry-education integration

In the process of continuous exploration and innovation in higher vocational education, scholars put forward innovative education models: integration of production and education, school-enterprise cooperation, and comprehensive improvement of students' vocational skills through the combination of education and training. In recent years, the State Council and the provincial government have been advocating school-enterprise cooperation and the integration of industry and education, demanding to promote the organic connection of the education chain, talent chain, industry chain and innovation chain [5]. In December 2017, the General Office of the State Council issued several opinions on deepening the integration of industry and education ([2017] No. 95), requiring deepening the integration of industry and education, improving the quality of education, expanding employment and entrepreneurship, promoting economic transformation and upgrading, and cultivating new drivers of economic development. In December 2018, Zhejiang Province also put forward corresponding implementation suggestions, which shows the importance of the integration of industry and education, and also provides guidance on how to do it. China's higher vocational education focuses on the cultivation of students' ability to apply new technologies. In the process of practice, many have implemented school-enterprise collaborative education measures [6] to improve the practical teaching level, improve the industry-university-research collaborative education mechanism, and build a multi-party collaborative education platform to improve students' job competitiveness. Most of these partners or intended partners are information technology enterprises in the region.

2.2. Dual vocational education in Germany and modern apprenticeship in Britain

Facing the historic intersection of a new round of scientific and technological revolution and industrial revolution, "new engineering" has become a hot word in the current topic of teaching reform in colleges and universities. In western developed countries, modern apprenticeship

has become very popular, such as the "dual system" in Germany, the modern apprenticeship in Britain, and the cooperative education in the United States. The core of German vocational education is the famous "dual system", which is known as the secret weapon of German vocational education. German teenagers receive training in enterprises and compulsory education in vocational schools. This form of learning is known as "dual system". Learning from the experience of the dual system in western countries and carrying out teaching reform on the talent training of big data analysis posts under the background of new engineering is a task that higher vocational colleges must face.

2.3. Research feedback teaching

In addition to imparting knowledge, university teachers also need to add some skills in scientific research activities, such as the frontier of discipline development and new technologies, into classroom teaching in time, in order to cultivate students' scientific research thinking and literacy in the process. At present, most of the teaching models are still the traditional classroom teaching system. However, some big data majors have certain self-study ability and research and development ability, but their subjective initiative has not been brought into play. Students' learning and scientific development are still in a passive state, which to some extent hinders the exploration of innovation potential. At present, many front-line teachers have carried out a lot of beneficial practical exploration on the scientific research back-feeding of the new technology curriculum in higher vocational colleges, with remarkable results.

2.4. Modular teaching method and "1+X" certificate system [7]

China's research on modular teaching is earlier than "project-based" teaching, and has put forward a variety of teaching reform attempts, such as the design of the "three integration" (integration of innovation and entrepreneurship education concepts, integration of flipped classroom teaching methods, integration of scientific research project research) curriculum reform model of "leading edge reading+thematic research+project training"; In the thinking and innovation practice of the project-based modular teaching reform of some courses, the teaching reform mode is designed according to the idea of "the work process of the course system is oriented, the course content is project-based, and the course teaching is integrated"; Based on the new teaching concept of OBE, many engineering courses have reformed and explored the teaching methods of the courses, established the student-centered and learning results-oriented teaching concept, proposed the use of modular teaching, and implemented the "student-centered and project-driven" teaching reform.

2.5. Summary

China's vocational education pays attention to the training of engineering technology application ability, and constantly reforms the teaching mode of training various practical skills. This topic takes the course "Big Data Analysis Technology" as an example, combines the source of higher vocational students and vocational training objectives, explores the integration path of project-based and modular knowledge and skills system, and constructs a modular teaching model applicable to the big data analysis course. We design and optimize the teaching of courses through scientific research feedback. We introduce the application of data analysis cases of horizontal scientific research work, and explore the project-based talent training mode of school-enterprise dualistic industry-learning collaborative education based on school-enterprise cooperation and industry-teaching integration, which combines the project flow, so that students can learn and use, and improve learning interest and enthusiasm, Let students majoring in big data technology better master the research and development achievements and the latest technology closely combined with production practice, and improve their employment competitiveness.

3. Course construction and implementation path

The construction of professional courses in higher vocational colleges should be based on the needs of the post, combined with the characteristics of students from different sources, and reverse design of courses based on the OBE concept to form a "student-centered, employment-oriented" curriculum construction idea. Under the opportunity of vigorously advocating school-enterprise cooperation and industry-teaching integration, we will further deepen school-enterprise cooperation, combine "1+X" certificate training, and explore project-based and modular curriculum resource construction and teaching mode design that meet the characteristics of higher vocational students. The curriculum construction needs to put forward corresponding teaching reform measures and suggestions in combination with the needs of online and offline hybrid teaching, to achieve the close connection between professional training objectives and industrial development, and finally improve the quality of employment on the basis of ensuring the number of jobs, and to take a positive step forward in promoting the cultivation of data analysis ability and comprehensive quality of big data majors.

Next, we will take Big Data Analysis Technology as an example to illustrate the key methods and paths for the construction and implementation of the course.

3.1. Connect with the post, and research the content reconstruction path of project-based curriculum based on OBE concept

According to the principle of results-oriented (OBE), taking Big Data Analysis Technology as an example, we have to reverse design and build a project-based modular curriculum system to transmit social needs into the curriculum system. The construction of the curriculum system follows the OBE principle, that is, the reverse design principle. Take the position orientation as the final output, reverse build the core competencies that support it, and all the core competencies support the position orientation. The training specifications support the core competence, and the curriculum system supports the training specifications.

3.2. Multi-party linkage and integration into the all-round talent training mode of ideological and political education research

The curriculum construction and teaching adhere to the ideological and political guidance, implement the tripartite linkage of "professional teachers", "senior tutors" and "enterprise tutors", and integrate the three classes of "in-class teaching, early training and evening training, and off-campus practice" to implement the ideological and political collaborative education mode [8], so as to cultivate students' good learning, behavior and professional habits, and achieve the comprehensive development of students' moral, intellectual, physical, aesthetic and labor.

3.3. School-enterprise cooperation, using information technology to research the construction process of supporting integrated teaching resources

In order to implement individualized teaching and improve the quality of students' learning, the development of professional courses in higher vocational colleges should focus on the construction of digital resources in "different levels" and "different industries", give full play to the online platform, online and offline communication, and realize personalized customized teaching while serving social training.

Under the OBE concept, the development of professional curriculum resources in higher vocational colleges should be based on the characteristics of knowledge, skills and quality, combined with the project-based and modular curriculum structure, build teaching resources including various forms, and develop loose-leaf teaching materials matching the Data Analysis Python Practice [9-12].

3.4. Quantitative assessment, combined with collected multi-dimensional data to design accurate evaluation methods

Based on the course design and specific teaching implementation process, the module course evaluation mechanism is constructed by accurately collecting the process data of teaching and learning around the three teaching links of "pre class, during class and after class". Through three main bodies, namely, teacher guidance, student assistance, and third party supplement, students' individual and team are evaluated comprehensively. The evaluation indicators should cover "knowledge, skills and quality" in order to "promote teaching by evaluation, promote learning by evaluation, and promote management by evaluation", and finally achieve the optimization of teaching design, supervision of students' learning progress, and improvement of overall teaching management to influence the subsequent training process, forming a teaching closed-loop.

4. Conclusion

In the teaching of China vocational and technical colleges, there are some problems, such as the deviation of teachers' teaching objectives, the inappropriate selection of teaching materials, the weak learning foundation of students, and the integration of ideological and political issues. In the course construction, we need to solve it slowly. How to excavate the ideological and political elements and select the ideological and political carrier, and synchronize the knowledge teaching, ability training and value guidance are the key issues to be solved in the professional curriculum of higher vocational education. In addition, the practice of enterprises and industries has developed rapidly. There are new products and technologies in enterprises, but relevant knowledge has not been added to school textbooks in time. How to integrate the resources of schools and enterprises and strengthen the construction of information resources has become an important way for the development of professional courses in higher vocational colleges. Based on the school-enterprise cooperation, this paper explores a school-enterprise dualistic, production-study collaborative teaching model suitable for the practical needs of higher vocational education. Based on the backbone of the national double-high professional group of big data technology, we take the course construction and teaching reform of Big Data Analysis Technology as an example to explore the modular course construction path and teaching mode.

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