Research on the Construction and Implementation of Big Data Technology Specialized Curriculum under the "Post-Course-Competition-Certificate" Integrated Training Model

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Abstract

The purpose of this paper is to improve the cultivation quality of big data technology professionals through the research of curriculum reform, in order to adapt to the needs of the digital transformation of society. The article firstly analyzes the current research status of domestic and international big data professional curriculum, and points out the lagging problems in curriculum construction and talent cultivation in higher vocational colleges and universities. On this basis, it puts forward the teaching reform plan of "Post-Course-Competition-Certificate", emphasizing the importance of modular teaching content design, the integration of multi-dimensional skills competition, and the hybrid teaching mode of "online + offline". The article also introduces innovative teaching methods and multi-dimensional data assessment programs to comprehensively assess students' learning outcomes. Through these measures, we aim to cultivate high-quality big data professionals who are competent for big data positions in digital transformation.

Keywords

Post-Course-Competition-Certificate, Modularization, Curriculum reform, Training model.

1. Introduction

Big data technology specialty is a new technology application specialty within the information class. The theoretical knowledge and practical skills learned need to be applied to actual job requirements. Through the research of curriculum construction and reform, we can improve the integration of curriculum with posts, competitions, and vocational skills certificates [1, 2], improve the professional knowledge and practical skills of big data professionals, so as to achieve the improvement of teaching quality and talent quality, and ultimately achieve the goal of delivering high-quality professional and skilled personnel to the society, and delivering high-quality professionals to the society, who are capable of performing key positions such as platform operation and maintenance, and technology research and development in the digital transformation. The new form of curriculum teaching reform can form a new teaching model.

The new form of curriculum teaching reform can form a set of effective "Post-Course-Competition-Certificate" integrated education mode curriculum construction and teaching theory program, expanding a variety of teaching forms and enriching teaching resources. Curriculum design into the job, competition and vocational skills level certificate standard requirements, to cultivate a group of flexible use of skills has a positive effect [3], but also for the subsequent students to participate in athletic competitions and job recruitment to enhance competitiveness. With the improvement of the quality of classroom teaching, it naturally leads to the improvement of the quality of student training, and can better deliver high-quality engineering talents related to big data majors to the society.

2. The current status of domestic and foreign big data professional curriculum research

At the China Vocational Education Conference held on April 13, 2021, the concept of "Post-Course-Competition-Certificate" education mode was officially proposed for the first time, which made it clear that the vocational education teaching system is an important development direction in the reform of education mode. This concept emphasizes the close integration of job requirements, curriculum teaching, competition training and vocational skills certification, in order to cultivate high-quality technical and skilled personnel who meet the needs of social development.

2.1. Teaching resources for big data majors

The year 2013 marked the emergence of the big data industry, which ushered in the rapid development of big data technology. However, it was not until 2016 that the Ministry of Education added the professional catalog of "big data technology and application" in the category of senior electronic information, and higher vocational colleges and universities began to carry out pilot training in this field. This shows that higher vocational colleges and universities started late in the construction of big data professional courses and talent training, and there is a certain lag with the pace of industry development. At the same time, the teaching level of teachers, curriculum teaching resources and practical training environment are not perfect enough, and there is a certain gap with the big data industry, which can not keep up with the rapid development of big data technology [4].

2.2. Big Data Professional Talent Cultivation Strategy

At present, higher vocational colleges and universities are mainly concerned about the correspondence between the big data professional talent training system and the "Post-Competition-Certificate" on the whole. The content covers most of the post direction of big data specialty, involving "big data technology and application" vocational skills competition knowledge points and "big data platform operation and maintenance" and "big data analysis technology". The vocational skills level assessment standard, there is a distance between the talent training mode and the actual needs of the society.

2.3. Foreign Talent Cultivation Mode

At present, a number of international countries have carried out the exploration of modern apprenticeship education [5]. For example, the German "dual system" training model, which alternates between school education and enterprise practice; the British industry-academia integration model, which is based on the "learning-practice-learning" training of apprentices; and the American registered apprenticeship model, which is based on the combination of on-the-job training in enterprise positions and theoretical teaching in community colleges. Cultivation Model. Germany, the United Kingdom and the United States of America's modern apprenticeship training model, are based on in-depth cooperation between schools and enterprises, the form of joint training [6].

2.4. Challenge and Opportunity

Although higher vocational colleges and universities have covered the content of "Post-Competition-Certificate" in the overall cultivation process of "Big Data Technology", there are still some problems in benchmarking the market job requirements and talent goals, which are highlighted as failure to keep up with the market job skill requirements, lack of targeted practical project training, lack of online learning data resource platform and practical training platform support and other problems. However, there are still some problems, highlighting the failure to closely follow the requirements of market job skills, the lack of targeted practical

project training, the lack of online learning data resource platform and practical training platform support and other issues. Adopting the "Post-Course-Competition-Certificate" integration method to build new teaching resources and new talent training mode is a new direction for the reform of education. For the cultivation of big data professionals, it is necessary to cooperate closely with famous enterprises in the industry, and convert actual project resources into in-class practical training resources through order classes and internships, etc. At the same time, it is necessary to optimize the curriculum training system. At the same time, it is necessary to optimize the curriculum training system, integrate the multi-dimensional competition syllabus and vocational skills level certificate assessment standards of "Occupation-Discipline-Industry", and close the distance between professional courses and actual needs. Higher vocational big data technology professional curriculum construction and implementation, also needs to learn from foreign advanced vocational education experience, combined with regional characteristics and industrial characteristics, to form a distinctive curriculum teaching system.

3. Big data professional curriculum construction based on the model of "Post-Course-Competition-Certificate" [7, 8]

This paper carries out research based on the "Big Data System Operation and Maintenance Practice" course, as shown in Fig. 1. The modularized teaching content of the course is designed to meet the standards of the relevant positions, competitions and certificates of the course. At the same time, the experience of teachers' guidance, teachers' participation and students' participation is integrated into the course module and implementation links. Through the real teaching implementation of the course, the modularized design content of the course and classroom teaching methods and means are adjusted in the reverse direction.
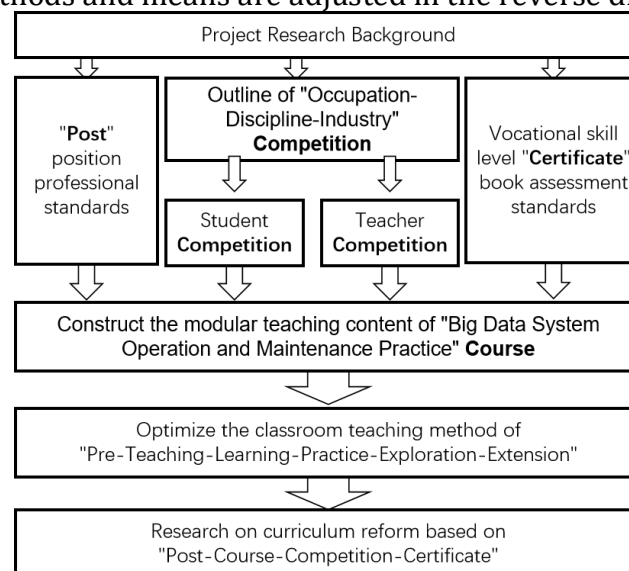

Fig. 1. Curriculum Development and Implementation Pathway

3.1. Align with the standard of "Post-Competition-Certificate" and design the modularized teaching content of "Course"

Taking the vocational standards of big data engineers and technicians and the talent training program as the core, it is divided into five teaching modules, as shown in Fig. 2: Hadoop platform, fully distributed deployment, HA cluster deployment, Hadoop component application and government project practice; combining with the "big data technology and application" vocational skills competition to realize the following "Promote teaching by competition", "Promote learning by competition" and "Promote reform by competition". At the same time, the course content strictly refers to the "1 + X big data platform operation and maintenance"

vocational skills level certificate assessment standards, to ensure that the course and the certificate of seamless docking [9, 10]. In addition, innovative application cases in the field of big data are integrated into the course to enrich and improve the modularized teaching system. The course is centered on the main objective of systematically supporting the dream of a strong nation, and always integrates the elements of Civics and Politics in all stages and links of the course system and classroom teaching. Each teaching module adopts a combination of theory and practical training, and the knowledge and skill requirements between modules progress gradually.
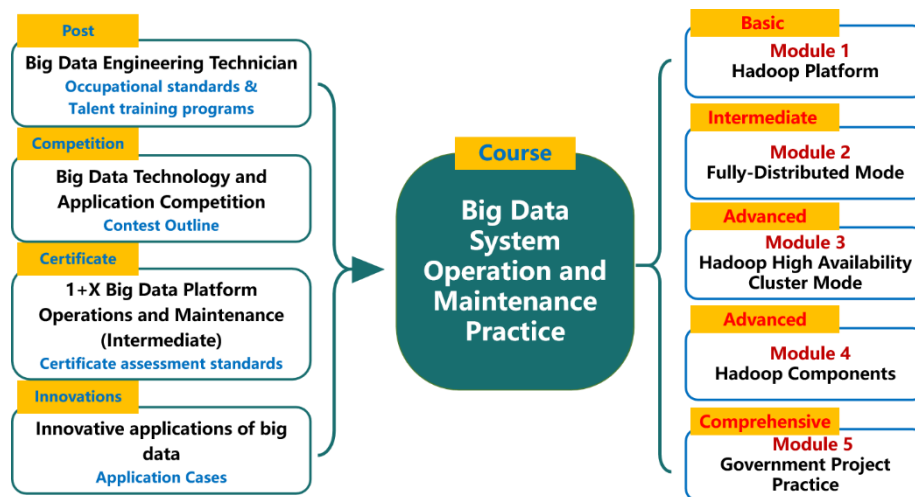

Fig. 2. Modularized teaching content of the course "Big Data System Operation and Maintenance Practice"

3.2. Integrate the contents of multi-dimensional skill competitions into the curriculum teaching system

In line with the standards of the syllabus of the multi-dimensional competitions of "occupation, discipline and industry", we integrate the relevant competition contents into the curriculum teaching system. We attach importance to drawing lessons from the experience of guiding students to participate in competitions, and at the same time carefully analyze the feedback and problems encountered by students in competitions. Based on these valuable feedbacks, we design the course teaching links to strengthen students' ability to discover, analyze and solve problems on their own. In order to gain a deeper understanding of the various aspects of the competition, we encourage teachers to participate in the vocational skills competition themselves. Through personal experience, teachers can intuitively feel the specific requirements of the competition on knowledge and skills, so as to optimize the curriculum teaching system and the setting of teaching links in a more targeted manner.

3.3. Construct "online + offline" hybrid teaching mode, integrating multiple teaching methods

Relying on the Chaoxing course platform, 1+X big data operation and maintenance training platform and Pieuvre Big Data training system to carry out "online + offline" hybrid teaching mode, provide practical training platform, operation video and teaching resources, improve students' learning resources in space and time, and make it convenient for students to learn anytime and anywhere. At the same time, increase teacher-student interaction, student-student interaction, give students a richer form of teaching, improve the overall teaching effect. The practical training resources provided by the platform allow students to focus more on the knowledge and skills themselves, reducing the time wasted due to the preparation of the practical training environment.

Different teaching methods are used before, during and after the classroom, referred to as "Pre-Teaching-Learning-Practice-Exploration-Extension" teaching methods, as shown in Fig. 3. The rational use of teaching methods allows students to experience the learning process of basic, advanced and progressive step by step.

Self-study pre-study method (Pre): Check the course teaching content in advance, independent study to make a good knowledge reserve.

Knowledge teaching method (Teaching): Through the language image vividly explain to help students better understand the teaching knowledge.

Case study method (Learning): According to the specific case demonstration, so that students understand the practical training process and details.

Task-driven method (Practice): Through in-class practical training tasks, create scenarios for teaching and realize the consolidation of knowledge and skills.

Problem solving method (Exploration): Combine the problems in practical training to cultivate students' ability of independent discovery, analysis and problem solving.

Self-study and expansion method (Extension): Use the time after class to check the gaps and realize the consolidation of learning and self-improvement.
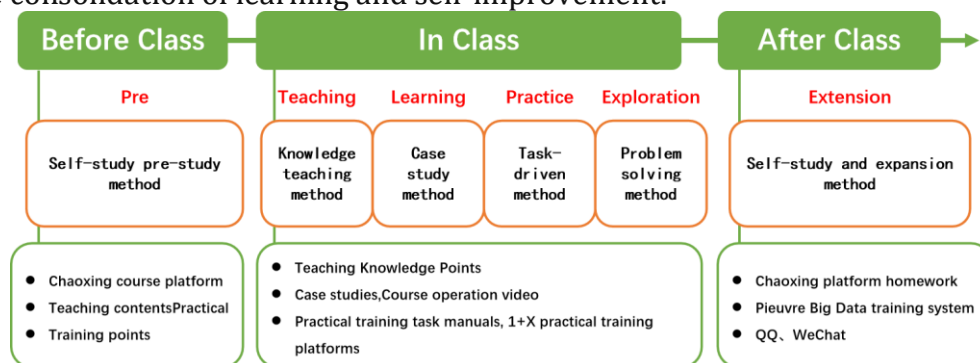

Fig. 3. Classroom implementation process

3.4. Multidimensional data assessment programs [11]

In order to comprehensively assess students' learning outcomes, we have carefully designed two innovative assessment programs. The first one is the course assessment program: around the online learning data generated before, during and after the class, task progress, practical training notes and theoretical knowledge assessment and other process assessment data, and combined with the final course skills requirements of the actual hands-on assessment data, the formation of a comprehensive course assessment data. The second is the certificate replacement program: to formulate rules for the replacement of vocational skills level certificates and course grades, and to realize the three-classroom integration replacement assessment program for the real integration of certificates and courses. These two assessment programs together constitute a multi-dimensional, multi-level evaluation system designed to promote student learning motivation, improve teaching quality, and ensure that students can truly master the required professional knowledge and skills.

4. Conclusion

In the context of the digital era, the big data technology specialty, as an important field of information-based new technology application, is of great significance for the cultivation of high-quality technical and skilled talents who can adapt to the needs of social development. This article discusses in depth how to improve the cultivation quality of big data professionals through curriculum construction and reform, in order to meet the urgent needs of society for digital transformation talents.

The article first reviews the current research status of domestic and international big data professional courses, and points out the problem of out-of-sync with the development of the industry in terms of curriculum construction and talent cultivation in higher vocational colleges and universities. The curriculum construction and talent cultivation of big data majors in higher vocational colleges and universities started late, and there is a certain lag with the rapid development of big data technology, at the same time, the teaching resources and practical training environment are not perfect.

Aiming at these problems, the article puts forward a teaching reform program based on the "Post-Course-Competition-Certificate" education. The program emphasizes the close integration of course content with job requirements, competition training and vocational skills certification, and realizes the in-depth integration of the curriculum with industry needs through modular teaching content design, integration of multi-dimensional skills competitions, and the construction of "online + offline" hybrid teaching mode.

Classroom teaching adopts a variety of educational methods, aiming at guiding students from basic to advanced and then to advanced through different teaching strategies, realizing a step-by-step learning process. Meanwhile, the article also proposes a multidimensional data assessment program, including two assessment methods, namely, course assessment and certificate replacement, in order to comprehensively assess students' learning outcomes.

Through these teaching reform measures, the article finally concludes that it is possible to cultivate high-quality big data professionals who possess both solid professional knowledge and rich practical skills and innovation ability. These talents will be able to take up key positions in digital transformation and make positive contributions to the development of society.

Acknowledgements

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