

Research on the Curriculum Reform of "Python Basics and Applications" based on the Integration of "Position, Course, Competition and Certificate"

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Abstract

The integration of "position, course, competition and certificate" has currently become a new direction for higher vocational colleges to explore the reform of talent cultivation models and curricula. This paper takes the "Python Basics and Applications" course of the Business Data Analysis and Application major as an example. By actively connecting with job requirements, competition standards and certificate requirements, a closed-loop system of "teaching - learning - doing - evaluation" is constructed to explore and practice the comprehensive education model of "position, course, competition and certificate", with the aim of enhancing students' employment competitiveness and career development potential and facilitating the precise supply of business data analysis talents in the digital economy era.

Keywords

Python; Curriculum Reform; the Integration of "Position, Course, Competition and Certificate"

1. Introduction

With the release of documents such as the "National Vocational Education Reform Implementation Plan" and the "Opinions on Promoting High-Quality Development of Modern Vocational Education", the integration of "position, course, competition and certificate" has gradually become a new direction for higher vocational colleges to explore the reform of talent cultivation models and curricula. At present, many scholars in China have put forward their own thoughts on the teaching reform of "position, course, competition and certificate". However, on the whole, the research on the integration of "position, course, competition and certificate" based on specific professional courses is still relatively lacking. This project takes the "Python Basics and Applications" course of the Business Data Analysis and Application major as an

example. According to the job requirements, competition standards, and certificate ability requirements, the course standards are revised and the course content is re-constructed, fully integrating "position, course, competition and certificate" into the course teaching.

2. Problems existing in the course of "Python Basics and Applications"

Under the trend of the accelerated advancement of Digital China construction, enterprises' demand for technical and skilled talents in business data analysis is increasing day by day. The "Python Basics and Applications" course offered by W Vocational and Technical College serves as a core professional course for the Business Data Analysis and Application major. It aims to cultivate students' abilities in data collection, processing, analysis and visualization using the Python language, laying a solid foundation for their future careers in data analysis. After investigation, it was found that there are the following problems in the integration of "position, course, competition and certificate" in this course:

2.1. Disconnection between positions and courses

At present, the teaching content of "Python Basics and Applications" mainly focuses on the basic syntax of Python, emphasizing syntax over application. There is a lack of support from real enterprise case data, and students still cannot solve practical problems after learning. During the practical training teaching process, the design of teaching projects is overly simplistic and incoherent, still remaining at the superficial stage of knowledge imparting. It fails to conduct project-based design based on the actual job processes of enterprises and is disconnected from the job requirements of related enterprises. As a result, students find it difficult to enhance their technical application abilities through course learning.

2.2. Separation of courses and competitions

At present, the "Python Basics and Applications" course is not closely integrated with the Python assessment points in competitions. On the one hand, the "Python Basics and Applications" course involves numerous vocational skills competitions. For instance, the Business Data Analysis and Big Data Application Development events in the World Vocational College Skills Competition, as well as the Business Data Analysis and Python Programming Development events in the "Belt and Road" and BRICS Skills Development and Technological Innovation Competition, etc. Therefore, it remains to be studied which competition to choose for the integration of courses and competitions. On the other hand, vocational skills competitions are rather difficult and have high requirements for students' comprehensive qualities. As a result, students' initiative to participate is not high. Therefore, only a few students are involved in the competitions, and the training on the competition content

has become a phased training, leading to the separation of classes and competitions and failing to achieve the goal of improving students' professional skills through skills competitions.

2.3. Decoupling of courses and certificates

At present, the integration of the Python Basics and Applications course with the skill points required by the "1+X" Python Programming and Development Vocational Skills Certificate is not very high. The skill points of the certificate have not been fully integrated into the course, and it is not clearly stated during teaching which contents correspond to which certificate examination points. As a result, students still need additional training after completing the course before they can obtain the certificate. It increases the learning cost, reduces the employment competitiveness, and ultimately leads to the phenomenon of poor integration effect of courses and certificates.

3. The curriculum reform plan of "Python Basics and Applications" based on the integration of "position, course, competition and certificate"

3.1. Integration of "position, course, competition and certificate" and reconstruction of teaching content

In response to the issues of disconnection between positions and courses, separation of courses and competitions, and decoupling of courses and certificates in the "Python Basics and Applications" course offered by W Vocational and Technical College, the course team of "Python Basics and Applications" conducted on-site and online research at enterprises to clarify the daily job tasks and job workflow of the business data analysis job group. Taking the job workflow of enterprises as the main line, Taking real enterprise projects as the carrier, the traditional course content was restructured in a project-based manner. A total of five projects were set up: Python Basics, data collection of user reviews on e-commerce platforms, Data Processing of Sales in chain supermarkets, Data Analysis of Operation in Chain Catering Stores, and Data Visualization of operation in chain Catering Stores. Targeted and practical teaching tasks were also designed.

The "Business Data Analysis" event of the World Vocational College Skills Competition was selected as the goal of the "integration of teaching and competition" for the "Python Basics and Applications" course. The knowledge points and skill points included in the competition were sorted out and refined, and the "1+X" Python Programming Vocational Skills Certificate was actively integrated. Selectively extract the relevant knowledge points and skill points included in the vocational skills standards, avoid repetitive knowledge points and skill points, and then incorporate them into the course teaching design through methods such as pre-class preview, in-class integration, and post-class expansion based on the difficulty level of the

knowledge points and skill points, to build a curriculum system where "position, course, competition and certificate" are mutually integrated.

3.2. Integration of "position, course, competition and certificate" and optimization of teaching design

The teaching team of the "Python Basics and Applications" course, in light of the learning characteristics of students, has divided the teaching design of each project into five main steps: clarifying project objectives, formulating project implementation plans, explaining relevant knowledge, project implementation, and project evaluation. Before class, teachers use the Smart Vocational Education platform to release micro-lesson videos and guided learning tasks, helping students understand the task requirements, collect students' learning data, and adjust teaching strategies and key and difficult points based on their learning and test situations. During class, teachers issue task books and clarify learning goals in line with job tasks. Students conduct inquiry-based learning according to the task requirements and formulate project implementation plans through group discussions. The teacher explains the key and difficult points of the operation in the implementation process, and the students improve the project implementation plan. After students complete the tasks according to the proposed plan, they make presentations. Teachers and groups give comments, provide scores and suggestions, and then improve and optimize the results. Teachers summarize the tasks, sort out the key points and common mistakes in the operation process. After class, the teacher classifies and pushes extension tasks based on the comprehensive evaluation results before and during the class. Students continuously optimize their plans and complete the extension tasks.

3.3. Integration of "position, course, competition and certificate" and reform of evaluation methods

In the past, the "Python Basics and Applications" course mostly evaluated students' grades based on a combination of regular performance and final exam results, while neglecting the results of certification exams and skills competitions. Some students had to prepare for skill certificates and skills competitions in their spare time while preparing for the course exams, which reduced their enthusiasm for participating in competitions and obtaining certificates. Therefore, in order to achieve the comprehensive education goal of "job, course, competition and certificate", it is necessary to reform the assessment method of the courses. Specifically, course grade = regular performance (60%) + final assessment (40%). The regular performance is composed of three parts: class attendance, classroom performance and practical tasks, accounting for 10%, 20% and 30% respectively. The final assessment score is the objective result of the computer-based test. It can also be replaced by the student's certification scores or participation in skills competitions. For example, obtaining the "1+X" Python Programming Development Vocational Skills Level Certificate (In-

intermediate) can be directly converted to 100 points, while obtaining the junior certificate can be converted to 80 points. In vocational skills competitions, winning the first prize or above at the provincial level can be directly converted into 100 points. Winning the second and third prizes at the provincial level can be respectively converted into 90 and 80 points. For other competitions, the conversion will be based on the level of the event and the grade of the award.

4. Conclusion

The curriculum reform of "Python Basics and Applications" in the Business Data Analysis and Application major, with the integration of "position, course, competition and certificate" as its core, aims to solve the problem of the disconnection between traditional courses and industry demands, and cultivate high-quality technical and skilled talents in business data analysis who possess Python data analysis capabilities, business problem-solving skills and professional certification qualifications. By aligning with job requirements, competition standards and certificate requirements, a closed-loop system of "teaching - learning - doing - evaluation" is constructed to enhance students' employment competitiveness and career development potential, and to facilitate the precise supply of business data analysis talents in the digital economy era.

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