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Exploration of Ideological and Political Teaching Practice of Experimental Courses under the Concept of OBE-BOPPPS: Taking "Digital Economy Comprehensive Experiment" Course as an Example

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Abstract

Compared with the professional courses mainly taught in the classroom, the ideological and political construction of experimental courses in colleges and universities lags behind, especially for the experimental courses of digital economy that have only been established in recent years. Therefore, taking the digital economy major of Anhui University of Finance and Economics as the research object, and closely following the teaching concept of OBE-BOPPPS education, this paper discusses the ideological and political teaching practice ideas, teaching content overall design, teaching implementation process and teaching assessment methods of the newly opened "digital economy comprehensive experiment" course, and strives to provide discernible materials for the digital economy major to better promote the ideological and political construction of the experimental course on the basis of in-depth summary of the main measures and teaching practice of the ideological and political construction of this experimental course.

Keywords

OBE Concept; BOPPPS Mode; Comprehensive Experiment of Digital Economy; Course Ideology and Politics.

1. Introduction

Establishing morality and cultivating people is the fundamental task of education. At present, integrating curriculum ideology and politics into the teaching process of professional courses has become an important means to better promote the education of "establishing morality and cultivating people" and shape students' thinking and cognition. However, the problem is that the ideological and political construction of professional courses with classroom teaching as the main teaching method has made rapid progress and good practical results, while the ideological and political construction of professional experimental courses mainly based on experimental teaching has lagged behind, especially for the newly established digital economy majors in recent years, because their subject construction is still in the exploratory stage, the ideological and political construction of professional experimental courses is still weak, and reform and innovation are urgently needed to improve their efforts.

Facing the new situation and new challenges, General Secretary Xi Jinping pointed out that it is necessary to "comprehensively improve the ability of high-quality development of education services" [1]. In order to better serve the new business model of the digital economy, more than 60 universities in China have established digital economy majors. Anhui University of Finance and Economics is one of the universities that completed the establishment earlier. In line with

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the development trend of new business forms, the course teaching of digital economy major should pay more attention to the use of Marxist basic positions, viewpoints and methods to cultivate students' ability to have the basic methods and thinking modes of digital economy analysis, so it is particularly important to do a good job in the ideological and political teaching of experimental courses. Taking the "Digital Economy Comprehensive Experiment" course newly offered by Anhui University of Finance and Economics as an example, as the core course of digital economy major, it is a cross-curriculum comprehensive experimental course based on Excel, Python statistical analysis software and ThingJS platform, focusing on tempering students' ability to analyze scientifically and solve various problems faced in the development of digital economy in China. The experimental course is still in the initial construction period, and its ideological and political construction is also in the initial stage, so it is urgent to give a positive response at the level of theoretical research and practical exploration. In addition, considering that the traditional teaching concept led by knowledge transfer does not meet the requirements of the current ideological and political construction of the "digital economy comprehensive experiment" curriculum, focusing on the results-oriented education (OBE) concept of "student output" [2], and the BOPPPS teaching model of student-centered teaching and teaching practice [3], it should become the most important mode to promote the ideological and political teaching practice of this experimental curriculum.

Based on this, this paper focuses on OBE-BOPPPS education and teaching concept, and discusses the ideological and political practice teaching thoughts, teaching content overall design, teaching implementation process and teaching assessment methods of "Digital Economy Comprehensive Experiment" curriculum, and strives to provide identifiable materials for accelerating the quality of its curriculum ideological and political teaching practice and for the digital economy major to better carry out curriculum ideological and political teaching activities.

2. Practical Thoughts of Ideological and Political Teaching in "Digital Economy Comprehensive Experiment" Course

Based on economics and by means of digital technology, the major of digital economy has been integrated with management science, computer science and other disciplines, and has formed a characteristic training model of "discipline integration, industry-education integration, and technology integration". The "Digital Economy Comprehensive Experiment" course of Anhui University of Finance and Economics fully reflects the founding goal of the digital economy major. It is a characteristic experimental course based on the basic principles of economics and using digital analysis tools such as Excel, Python and ThingJS platforms to study the development phenomena of China's digital economy, the development cases of China's digital economy, and the development problems of China's digital economy.

At the National Education Conference in September 2024, General Secretary Xi Jinping stressed that "we must unremittingly cultivate people with the soul of socialism with Chinese characteristics for a new era". For this reason, the practice of ideological and political teaching in the course of "Digital Economy Comprehensive Experiment" carried out by Anhui University of Finance and Economics has always revolved around this guiding ideology, and has initially achieved the exploration results of the ideological and political teaching construction of this experimental course. Currently, the course targets about 150 students in the 2022 class of the digital economy major, and is also the first major student to take the course. In the course of teaching practice, following the concept of Achievement-Oriented Education (OBE), the focus of teaching is highly focused on the level of "student production", and based on the integration of a large number of ideological and political elements, the ideological and political teaching practice ideas of the experimental course are scientifically established, as shown in Figure 1.

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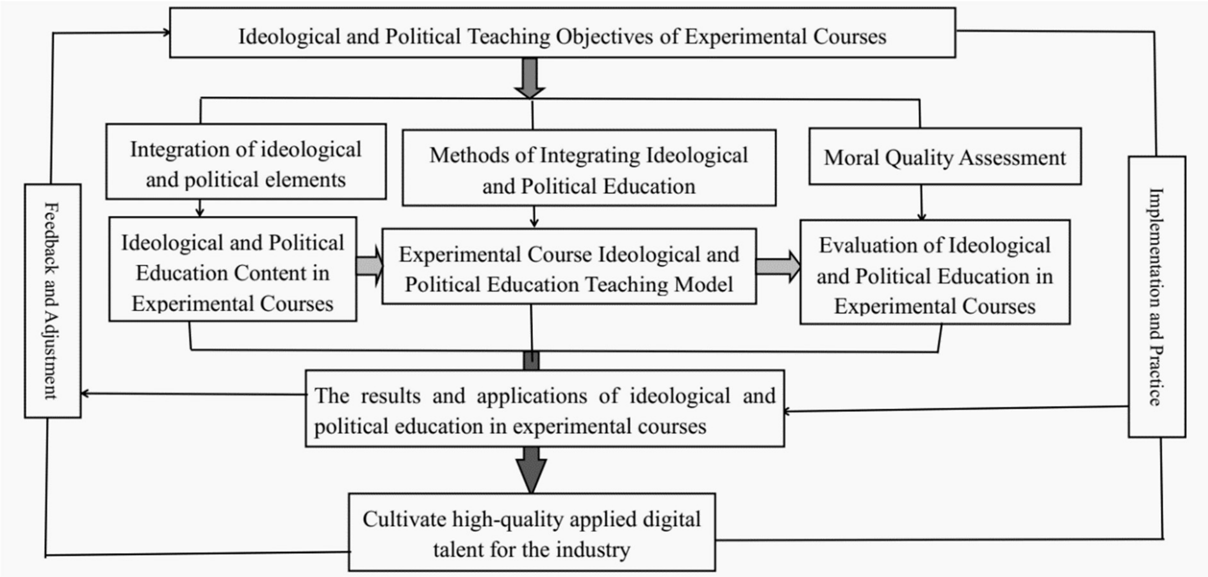

Figure 1. Ideological and Political Teaching Practice Diagram of "Digital Economy Comprehensive Experiment" Course

Figure 1 shows that under the OBE education concept, it is first required to clarify the ideological and political teaching objectives of the "Digital Economy Comprehensive Experiment" curriculum, that is, to cultivate professionals with wide caliber, compound high quality and applied industries that are required to meet the needs of the construction of new business forms of digital economy and the development of digital society in the central region. In order to realize this teaching goal, in the process of implementing and practicing the ideological and political teaching of experimental courses, on the one hand, we must fully excavate Chinese cases and refine ideological and political elements, so as to reasonably set up the ideological and political teaching content of experimental courses; On the other hand, we must make full use of online teaching platform tools such as Learning Link, Rain Classroom, QQ software, and rely on the experimental teaching equipment of the Experimental Teaching Center of the School of Economics to continuously innovate the ideological and political teaching model of experimental courses; Thirdly, it is necessary to incorporate the content of moral literacy into the evaluation of ideological and political teaching in experimental courses, such as through daily attendance inspection, classroom behavior inspection and digital economy development discussion inspection, etc., to scientifically evaluate students' usual performance and achieve the effect of ideological and political teaching in experimental courses. In addition, the achievements of ideological and political teaching in experimental courses should be formed accordingly, including experimental research reports, experimental course papers and experimental investigation reports related to the development of China's digital economy, and students should be encouraged to participate in various subject competitions and innovative entrepreneurship projects in a team form, so as to truly achieve the effect of applying their studies and learning from each other. Finally, through the investigation and comparison of the teaching results and applications, and combining the feedback of employers and graduates, the specific sub-goals of the ideological and political teaching of the "Digital Economy Comprehensive Experiment" course are adjusted in time to continuously improve the ideological and political teaching quality and teaching effectiveness of the experimental course.

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3. Design and Implementation of Ideological and Political Teaching Content of "Digital Economy Comprehensive Experiment" Course

3.1. Overall Design of Ideological and Political Teaching Content of "Digital Economy Comprehensive Experiment" Course

The overall design of the ideological and political teaching content of "Digital Economy Comprehensive Experiment" course should not only stimulate students' interest in learning basic operating knowledge and operating skills, but also combine the hot issues of digital economy development, highlight ideological and political elements [5], and create a benign interactive atmosphere of classroom operation exercises, two-way exchanges between teachers and students, and group cooperation. This is shown in Table 1.

Table 1 shows that the teaching module is divided into nine parts, and the teaching content focuses on the operation training of digital analysis tools such as Excel, Python and ThingJS platforms, as well as the practical application of these digital economic analysis tools; Ideological and political integration points highlight the understanding of the importance of data elements, highlight the cultivation of students' scientific research capabilities in the mining of China's digital economy development issues, the collection, collation, analysis and use of China's digital economy development data, and provide exchanges and application guidance on the final experimental results report; The method of integrating ideological and political elements mainly includes case explanation, classroom demonstration, experimental operation, group discussion, collaborative communication, after-class reflection, report writing and communication, and so on.

Table 1. Design of Ideological and Political Education Content for the 'Comprehensive Experiment of Digital Economy' Course

Serial Number	Teaching Unit	Teaching content	Integration points of ideological and political education	Integration method
A	Fundamentals of Programming for Digital Economy Data Analysis	Basic knowledge of digital economy data analysis tools, data sources, data storage and processing, and visualization word clouds.	Case studies on the development of China's digital economy. Relevant content on digital economy in the "Decisions of the Central Committee of the Communist Party of China on Further Deepening Reform Comprehensively to Promote Chinese-style Modernization", the "14th Five-Year Plan", and the report of the 20th National Congress.	Lectures, discussions, classroom demonstrations, experimental operations, database searches
B	Excel Business Data Analysis	Principles of Excel Business Data Charting, Selecting Chart Types Based on Analysis Purpose, Chart Editing Techniques, and Chart Output	Study the "Three-Year Action Plan for Data Element X (2024-2026)" and typical cases. Thematic discussion on the importance of data elements.	Case analysis, classroom demonstrations, experimental operations, group discussions
C	Power Query Data Cleaning	Basic applications of Power Query, basic	Cultivate students' ability to scientifically process	Class demonstrations,

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	and Transformation	operations for data cleaning, data merging, transformation of data table structure, filtering, conditional columns, and grouping operations.	data, and develop their scientific research literacy and data information integration skills.	experimental operations, group collaboration
D	Power Pivot Data Modeling and Analysis	Basics of Power Pivot application, Power Pivot data modeling, DAX language, DAX functions, filters and calculators	Learn knowledge about digital industry and industry digitalization. Analyze and process the value understanding of large-scale data.	Class demonstrations, experimental operations, group collaboration
E	Python Data Visualization Analysis	Python data visualization analysis, such as pie charts, donut charts, canvas distribution, axes and scales	The importance of studying the knowledge of new digital productive forces and the collection and visualization of its indicator data.	Class demonstrations, experimental operations, group discussions
F	Python Social Network Analysis and Visualization	Social network analysis and visualization in Python, such as Igraph, NetworkX, and Pyecharts for social network diagram analysis.	Artificial intelligence and machine learning case studies. Cultivating students' ability to perform statistical modeling and extract valuable data insights.	Class demonstrations, experimental operations, group collaboration
G	ThingJS Platform: Campus-Builder Quick Start	CampusBuilder installation and launch, introduction to the main interface, introduction to the editing interface, campus-level basic scene construction, building-level and indoor-level basic scene construction, model property settings	Explanation of digital rural construction and digital governance in rural areas. Study of the strategic goals and ten key tasks of the 'Digital Rural Development Strategic Outline'.	Class demonstration, group discussion
H	ThingJS Platform: Campus-Builder Practical Case	Overview of CampusBuilder main scene construction, building construction, and ThingJS system development	Case studies such as the interactive platform for people's sentiments in Jiangjiayan Town, Shiyan, Hubei, and the Digital Zhuzhuang Comprehensive Management Service Center in Zhujiazhuang Village, Jinan, Shandong.	Case explanation, classroom demonstration, group collaboration
I	Experimental Results Report	Research the issues related to the development of China's digital economy, and submit research papers, survey reports, or research reports.	The topic discusses how to better study the development of China's digital economy and to refine students' awareness and ability in scientific research.	Group discussion and report exchange

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3.2. Implementation of Ideological and Political Teaching Content of "Digital Economy Comprehensive Experiment" Course

The teaching model of BOPPPS consists of six parts: Introduction Bridge, Learning Goals, Pre-study, Participatory Learning, Post-exam and Summary. This teaching model is applied to the implementation of ideological and political teaching in the course of "digital economy comprehensive experiment", that is, it is concretely divided into six parts: the introduction of experimental projects, the establishment of experimental goals, the demonstration and mapping of experiments, classroom operation exercises, the submission and evaluation of experimental assignments, and the summary of experimental results. Taking "Excel Chart Editing Skills and Chart Output" content in teaching unit B as an example, the implementation process of ideological and political teaching content of experimental courses based on BOPPPS teaching model is as follows:

The first is the introduction of experimental items (B). With the help of one of the second batch of typical cases of "Data Element X" released by the National Data Administration and other departments at the China International Big Data Industry Expo on Aug 29, 2024, that is, the case of "Multi-Source Catering Data Real-Time Precision Service, Enabling Digitalization and Efficiency Enhancement in the Catering Industry", it illustrates the application value of business data collection, business data development and analysis services and data full-process security governance, and focuses on explaining the chart editing skills and chart output operations involved in the course, so as to quietly integrate the ideological and political element "data element importance" content into the course content, stimulate students' learning interest and motivation, trigger students' exploratory thinking, and thus lead to experimental projects.

The second is to establish the experimental goal (O). Through the teaching PPT, case materials and operation video links of this class published through the study pass, on the basis of students previewing to complete the experimental operation principles and preliminary understanding of the experimental operation steps, clearly explain the experimental objectives of this class, that is, proficient in quickly adding new data to the chart, adding data labels to the chart, enabling the production of small charts in the report, thermometer charts, average line charts and filling effects, as well as saving charts as templates and outputting them to WORD, PPT and other operation skills, so that students can clearly understand and express the learning goals of this class, especially fully understand the chart editing skills and chart output operations in the "data element×" action cases of real application scenarios.

The third is the experimental demonstration and mapping (P). Using the computer equipment of the Experimental Center of the School of Economics, the teacher demonstrated the experimental operation cases required by the experimental objectives in the classroom, and paid attention to the key explanation and repeated demonstration of error-prone steps. During the teaching process of experimental operation exercises, functional modules such as "discussion", "selecting people" and "grabbing answers" in the Learning-through teaching platform are timely used to strengthen communication and interaction with students in order to clarify the difficulty degree of operation content, accurately grasp the differences in students' training abilities, and form first-hand materials for the implementation of experimental operation teaching and later adjustment.

Fourth, classroom operation exercises (P). Participatory learning is the core element to embody the teaching concept of BOPPPS, and it is the key means to train students to form scientific research literacy and improve their data analysis ability. Therefore, this link requires students to complete the classroom operation case training by themselves, and combined with activities such as group discussions, mutual evaluation of operation skills, and operation exercise demonstrations to encourage students to deepen their proficiency in experimental operation skills. The teacher monitors the progress of the students' classroom operation exercises in real time, solves various problems encountered in the students' operation exercises in time, and effectively plays the role of answering questions and assisting each student to complete the experimental operation exercises with high quality.

Fifth, submittal and evaluation of experiment assignments (P). Through the release of after-school experiment evaluation assignments with embedded ideological and political elements, the students' classroom experiment operation skills and the ability to scientifically study the development of China's digital economy can be examined in time, which can not only timely understand the students' learning status, but also help to better stimulate students' enthusiasm for development, analysis and problem solving, but also help teachers to reflect and adjust the design of teaching content, and constantly soften the ideological and political teaching process of experimental courses. This link publishes the experiment assignment "Zhiwang Consult the article on "Digital Economy, Shared Development and Common Wealth". After downloading the appendix of the report at the end of the text, find the digital product wholesale and digital product retail data of the hometown province (city and autonomous region) from 2011 to 2017, perform operations on double charts, small pictures in the report, thermometer diagrams and filling effects, and output screenshots of the operation process and operation results to word documents to upload learning pass". Teachers evaluate the assignments submitted by students in a timely manner and give them a pertinent evaluation, praise the advantages and point out the deficiencies in order to effectively improve the interactive teaching quality of ideological and political courses in experimental courses.

The sixth is the Summary of Experimental Effects (S). Different from the traditional teaching mode, the BOPPPS teaching model pays more attention to students' own induction of knowledge. Therefore, for this lesson, students adopt the methods of group discussion and after-class homework evaluation in class, and then combined with the guidance of teachers, students complete the induction of "Excel Chart Editing Skills and Chart Output" operation skills and evaluation of learning results.

4. Evaluation of Ideological and Political Teaching in the Course of "Comprehensive Experiment of Digital Economy"

Based on the teaching concept of OBE-BOPPPS, the ideological and political teaching assessment of the "Digital Economy Comprehensive Experiment" course should not only assess the students' mastery of the theoretical knowledge and operation skills of the course, but also pay attention to the assessment of students' moral literacy. Among them, the part of theoretical knowledge and operation skills assessment is mainly carried out through classroom operation exercises, classroom question answers and after-school homework arrangement; The moral part closely revolves around "Xi Jinping Thought on Socialism with Chinese Characteristics in the New Era", and quantitatively evaluates students' "moral conduct" at the beginning and end of the semester through designing questionnaires and scales, and evaluates the process in the semester through classroom attendance and personal behavior observation; The literacy part mainly examines the students' practical application in the world outlook and methodology of "Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era", specifically through classroom theme discussions and exchange of experimental results. See Table 2 for details.

Specifically, as shown in Table 2, the ideological and political teaching assessment of "Digital Economy Comprehensive Experiment" course is composed of three parts[6], of which the first part is diagnostic evaluation, and the evaluation focus is on the students' usual moral performance. The evaluation will be divided into three stages: the beginning of the semester, the middle of the semester and the end of the semester, and will run through the whole process of the teaching semester. The total evaluation score of this part is 30 points; The second part is the formative evaluation, the focus of which is the student's experimental technical knowledge and ability. The evaluation consists of classroom operation exercises, classroom question answers and after-school homework, and mainly focuses on the cultivation of students' scientific research question ability. The total score of this part of evaluation is 40 points; The third part is the final evaluation. The evaluation focuses on the improvement of students' literacy. It mainly evaluates the students' ability to find problems during classroom topic discussions and the students' ability to analyze and solve China's digital economy problems reflected in the experimental results report. The total score of this part of evaluation is 30 points. This assessment and evaluation method is in line with the practical goal of ideological and political teaching in the experimental course of "cultivating high-quality applied industrial digital professionals", fully embodies the teaching concept of OBE-BOPPPS education, and has clarity and practicability. It is a necessary guarantee for high-quality ideological and political teaching in the course of "digital economy comprehensive experiment".

Table 2. Ideological and Political Education Assessment for the "Digital Economy Comprehensive Experiment" Course

Evaluation method	Evaluation focus	Review Content	Grade Percentage	Total Score
Diagnostic evaluation	Ordinary moral performance	Design a questionnaire for quantitative assessment at the beginning of the semester	5%	30
		Attendance in class and personal behavior performance during the semester.	15%	
		Quantitative evaluation through scales at the end of the semester.	10%	
Formative assessment	Experimental technical knowledge and skills	Classroom Operation Practice Evaluation	10%	40
		Score for answering questions in class	10%	
		Homework grading	20%	
Summative Evaluation	Improvement of literacy status	Score of Classroom Discussion on Themes	10%	30
		Experimental Results Report Scoring	20%	

5. Conclusion

"Digital Economy Comprehensive Experiment" is a compulsory course newly opened by the digital economy major in recent years. It is a multi-disciplinary cross-innovation course that focuses on cultivating students' ability to study scientific issues and meet the needs of high-quality talents in industrial digitization in the central region. At present, under the impetus of the era of the rapid development of the digital economy, the "Digital Economy Comprehensive Experiment" of Anhui University of Finance and Economics, as a newly opened professional experimental course, ensures that it can carry out and complete the ideological and political teaching practice of the course with high quality, and fills in the lag of the ideological and political teaching of the experimental course in time, which has important significance for better promoting the education of "establishing morality and cultivating people" and accelerating the pace of training high-quality applied digital economy professionals.

Therefore, based on the teaching concept of OBE-BOPPPS, the ideological and political elements are skillfully integrated into the teaching content of the experimental curriculum, the ideological and political integration methods are applied to the teaching mode of the

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experimental curriculum, and the moral literacy is included in the teaching evaluation of the experimental curriculum. Then, the ideological and political teaching content of the experimental curricula is designed in nine teaching units, and six teaching implementation links are adopted, namely, the introduction of experimental projects, the establishment of experimental objectives, the demonstration and mapping of experiments, classroom operation exercises, the submission and evaluation of experimental assignments, and the summary of experimental effects. It has important practical value to carry out practical exploration on the ideological and political teaching of the experimental curriculum. At present, although the ideological and political teaching of "Digital Economy Comprehensive Experiment" course is still in the stage of exploration and practice, in terms of the actual results shown in the early teaching assessment, it is not only recognized by most students, but also has a high enthusiasm for students to participate in ideological and political case studies, theme discussions and operation exercises, and classroom question answers and after-school assignments are 100% completed. Looking to the future, the ideological and political construction of the "Digital Economy Comprehensive Experiment" course needs to be continuously optimized with the times to continuously improve the quality and application effectiveness of the curriculum ideological and political teaching results.

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