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Blended Teaching Research Under 1 + X Certificate System - Take Big Data Financial Analysis as an Example

Yiming WANG[a,1], Luxia YI[b]
[a]*Guangzhou City University of Technology, Guangzhou, China*
[b]*Guangzhou Industry and Commerce College, Guangzhou, China*
ORCiD ID: Yiming Wang https://orcid.org/0009-0000-0931-8128

Abstract. A new round of scientific and technological revolution is booming, and new technologies such as big data, artificial intelligence, and block-chain promote comprehensive innovation in the economy and society. The digitization process in various industries and fields is accelerating, and the accounting industry is also deeply affected. The cultivation of intelligent compound accounting talents is imminent, and universities play a vital role in talent training. Based on the application-oriented undergraduate colleges and universities, based on the era of digital economy, the 1+X certificate system and the background of school-enterprise cooperation, this study takes the mixed teaching of big data financial analysis based on the DEEP platform as an example to explore the transformation from traditional accounting talents to intelligent compound accounting talents. The new path of training promotes the integration of production and education, and provides reference for the training program, curriculum, and teaching of accounting talents in colleges and universities.

Keywords. Big data financial analysis; 1+X certificate system; School-enterprise cooperation; Blended Teaching

1. Introduction

In the current era, data has become an important factor of production and a driving force for promoting the quality and efficiency of economic and social development. Under the impetus of information technology, accounting personnel should not only have professional skills but also have information technology literacy, and colleges and universities that cultivate accounting talents have a long way to go. How to cultivate intelligent compound accounting talents has become a problem that education and teaching must pay attention to and think about. In vocational colleges and application-oriented universities, the pilot work of academic certificate + several vocational skill level certificates system (hereinafter referred to as 1+X certificate system) is launched to improve the vocational education and training system, deepen the integration of production and education, school-enterprise cooperation, and cultivate compound technical talents for enterprises.

This study adopts the blended teaching mode to carry out curriculum reform in order

[1] Corresponding Author: Yiming WANG, E-mail: 849162395@qq.com, wangym@gcu.edu.cn.

to cultivate intelligent compound accounting talents. From the domestic literature, He Kekang pointed out that the advantages of traditional teaching and the advantages of Blending Learning should be combined to promote each other [1]. Huang Hongmei and others used the hybrid teaching method combining the chemical simulation experiment platform with the mobile phone We-Chat platform to better solve the problem of teaching status such as untimely communication between teachers and students [2]. Li Xuan and others designed five steps based on the online+offline blended teaching model: pre-class preparation, classroom teaching, experimental training, after-school summary evaluation, knowledge expansion, which effectively improved students' interest in learning and reduced the demand for class hours compared with traditional teaching [3]. From the relevant foreign literature, the blended teaching model is also a concept identified by the American Simon League, which integrates traditional teaching and online teaching to create a new teaching method [4]. EralpAltun, Barıs Demirdag et al.created a virtual laboratory (SANLAB) in 2019, which promoted learning activities based on active learning methods, and students can conduct interactive experiments in a computer environment [5]. Peng X s article puts forward how to use the online+offline blended teaching mode in colleges and universities, and puts forward the use of flipping classrooms, micro-classes, MOOCs online and offline teachers teaching, which can not only effectively improve students self-learning ability but also improve the teaching effect [6]. Jin X demonstrates the advantages of the online+offline blended teaching model compared with traditional teaching and online teaching, but it points out that choosing the appropriate online teaching platform is the top priority for the quality of this teaching model [7].

To sum up, the mixed teaching mode has become the main trend of curriculum teaching reform. In foreign countries, there are many virtual laboratories and MOOCs as online teaching tools. The main scope of implementation is the same as that in China, and it is mostly used in higher education [8-10]. Research shows that the online+offline blended teaching mode can improve the teaching effect, reduce the pressure of teachers, and promote students self-learning ability [11-13].

2. Application-oriented Undergraduate Colleges and Universities Mathematical Intelligence Compound Accounting Personnel Training Needs and Difficulties

2.1. The Demand for Accounting Talents in the Era of Big Data Intelligence

According to the Top Ten Information Technology Selection Reports Affecting Chinese Accountants issued by Shanghai National Accounting Institute in 2021, financial cloud, electronic invoice, accounting big data analysis and processing technology, electronic accounting archives, robot process automation, new generation ERP, mobile payment, data platform, data mining and intelligent process automation are the top ten information technologies affecting accountants. Technological innovations such as artificial intelligence, big data, and block-chain have spawned new industries, new formats, and new models. This urgently requires accelerating the training of a group of high-quality accounting talents who are proficient in both professional and information technology and have strategic thinking and innovation capabilities. Since the release of the Accounting Industry Medium and Long-term Talent Development Plan (2010-2020), although the construction of accounting talent team has been significantly improved, from the actual development of accounting talents, structural imbalances still exist. There

are more people engaged in basic accounting, and the supply of high-end accounting talents with new era development concepts, global strategic vision, and management innovation capabilities is insufficient.

2.2. Dilemma of Accounting Talent Training in Application-Oriented Universities

For colleges and universities, due to the special attributes of financial work, it is difficult for accounting majors to find enough positions to organize students practical training, resulting in low practical ability of students. For enterprises, the number of accounting students is huge, but there are not many people who can get started quickly, and there are few people who can have data thinking and use big data tools to deal with financial problems. The key to solving these problems lies in the training of accounting professionals in colleges and universities. How to set up a technical curriculum system, build big data professional courses, build training conditions, organize internships, and how to integrate production, education, and research has become a problem faced by various colleges and universities. At the same time, because the colleges and universities did not have strong big data technology teachers, courses, and training conditions before, the training of new accounting talents under the economic situation of data intelligence is facing difficulties [14-16].

2.3. School-Enterprise Cooperation to Promote 1+X Vocational Skill Level Certificate System

The 1+X certificate system aims to jointly develop talent training programs between schools and enterprises, break through the barriers between academic education and vocational training, closely combine professional knowledge with job demand skills training, strengthen students entrepreneurial and employment ability, and accelerate the cultivation of compound technical talents. The institutional foundation for alleviating structural employment conflicts. This project is a course offered by Shouguan Technology Co., Ltd.in cooperation with Yuelan (Shanghai) Data Service Co., Ltd.on the DEEP cloud platform. Not only to carry out teacher training, but also to encourage and organize students to obtain 1+X big data financial analysis professional qualification certificate after the completion of the course teaching, so as to realize the deep integration of industry, university and research.

3. The Course of Big Data Financial Analysis Opens a New Path for the Cultivation of Accounting Talents

3.1. Research on Students Intention to Lay the Foundation of Curriculum Demand

The course of Big Data Financial Analysis adopts a mixed teaching mode based on the DEEP platform. Guided by the 1 + X professional qualification certificate of big data financial analysis, it uses a variety of teaching methods to organically integrate big data data technology with enterprise financial analysis theory, and introduces teaching in the form of typical work tasks to cultivate compound accounting talents qualified for big data financial analysis positions. Before the start of the course, a questionnaire was issued

to collect students learning intentions. According to the questionnaire, students pay more attention to employment and the difficulty and practicability of professional courses.

Table 1. Students' confusion in the learning process of professional courses

Option	Proportion
It is difficult to learn professional courses.	53.67%
No interest	16.06%
Will not learn to be useful	45.87%
There is no direction of employment	62.39%
Disagree with the assessment method	18.81%
The classroom form is not novel enough	31.19%
Others	12.84%

From Table 1, senior students generally have a sense of employment anxiety. They pay attention to the difficulty and practicability of their professional courses, pay attention to the combination of theory and practice, and are eager to master more frontier information of the times, develop their horizons, broaden their knowledge of modern information technology and big data analysis and application, and expand their employment direction. This requires teachers to pay attention to the acceptance and practicability of the teaching content when teaching, as well as to provide students with relevant suggestions on employment. The course of Big Data Financial Analysis opens up new employment channels for students' employment.

Table 2. The professional skills that students think accounting major must have

Option	Proportion
Accounting processing capacity	93.58%
Management ability	61.47%
Language competence	49.54%
Financial software application ability	84.86%
Tax business processing capacity	77.06%
Financial management ability	72.94%
Organization and coordination ability	48.17%
Financial big data application analysis ability	76.15%
Practical ability	66.97%

At the same time, the survey shows that students believe that in addition to accounting ability, the accounting profession should also have the ability to apply and analyze financial big data, software application ability and practical ability, reflecting students' needs and expectations for big data financial analysis. It also shows that big data financial analysis is a practical course.

3.2. School-Enterprise Co-construction Provides Platform Technical Support

Strengthen the integration of school-enterprise cooperation, build a big data financial

analysis course group, and provide students with comprehensive financial data analysis and learning resources. This paper selects the 1 + X certificate system series of teaching materials for big data financial analysis, takes the professional skill level standard of big data financial analysis as the benchmark, relies on the DEEP big data financial analysis platform, and integrates the latest technologies such as data collection, processing, analysis and mining, data visualization and the latest applications of the industry into the teaching materials and training according to the big data processing process, so as to provide strong support for the latest skills requirements of big data financial analysis positions. The learning resources support online open courses, operation videos, PPT teaching courseware, internship and training operations and other resources. Some of the selected resources in the teaching materials are embedded in the two-dimensional code link. Readers can learn by scanning the code on the mobile terminal anytime and anywhere to meet the needs of blended teaching. Strengthen the cooperation between schools and enterprises to build curriculum resources, and continue to expand and improve education and teaching resources on the basis of the original curriculum materials, videos, and micro-classes, including curriculum syllabus, lesson plans, learning cases, papers, question banks, network resources, etc. Enrich the mixed teaching process and achieve sustainable improvement.

3.3. Open up a New Direction for the Training of Mathematical Intelligence Compound Accounting Talents

The big data financial analysis provides a breakthrough for the cultivation of new accounting talents. It not only combines the background of the digital intelligence economic era, but also combines with the vocational skill qualification examination to cultivate students' ability to process the whole link of big data and form the thinking of using data to solve practical work problems. Combined with accounting expertise, big data technology is used for data collation, processing, analysis, and data visualization, so as to deal with financial statement analysis, audit analysis, cost analysis, budget analysis and other issues.

4. The Design and Research of Blended Teaching Mode Based on DEEP Platform

4.1. DEEP Platform and Experimental Project Content

Big Data Financial Analysis relies on the DEEP training platform and is supported by the Windows operating system. The DEEP big data analysis system adopts the C/S system architecture, and the experimental training environment can be constructed in the way of cloud server or LAN server. The course includes two major sections and eleven experimental projects, which constitute the workflow of big data full-link processing. As shown in Figure 1.

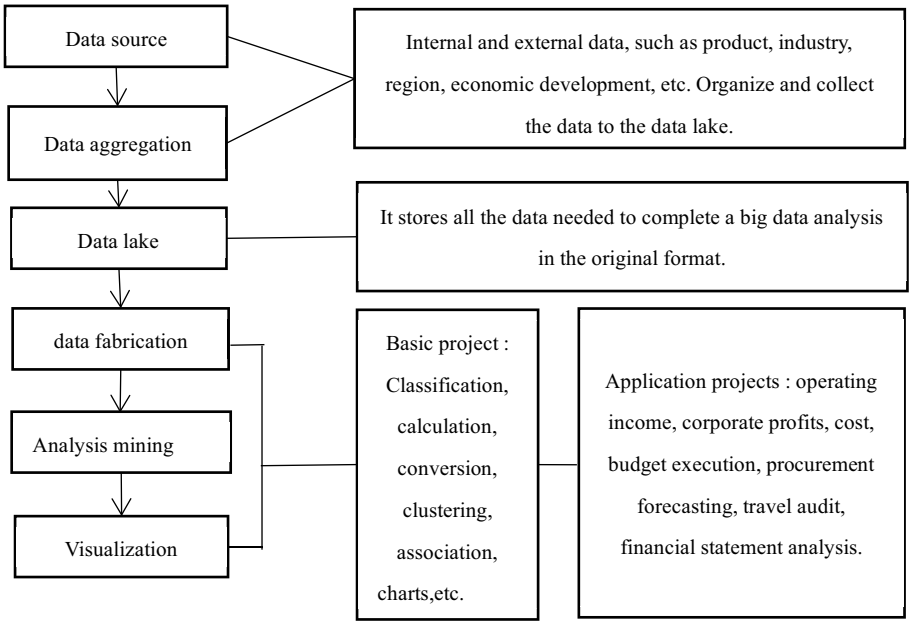


Figure 1. Big data financial analysis Full link processing workflow and project content

4.2. Introducing the IMPACT Cycle Model to Help Students Establish Data Analysis Thinking

University of Arkansas Sam. Vernon.J.Richardson, a professor of accounting at Walton Business School, believes that accountants do not need to become data scientists, but in the big data environment, accounting talents need to master seven kinds of data analysis thinking, namely, data analysis thinking mode, data cleaning and data preparation, data quality, descriptive data analysis, manipulation of data to perform data analysis, problem solving through statistical data analysis, data visualization and data reporting [17]. The big data financial analysis course is not only to train students to operate software, but also to cultivate students' big data analysis thinking in each project training. Therefore, the IMPACT cycle model is used to describe the data analysis process to students. In the continuous intensive training, students' big data thinking is trained to use linked data to solve business problems. As shown in Figure 2.

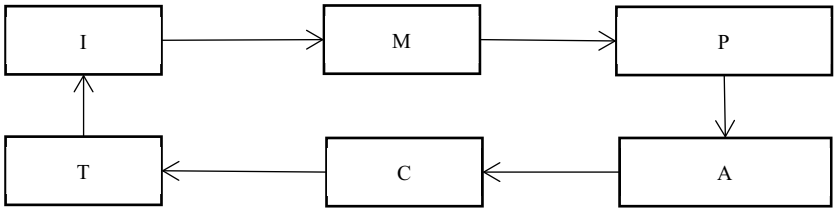


Figure 2. IMPACT cycle model

The steps of IMPACT cycle model are Identify the question, Master the data, Perform the test plan, Address, and refine the results, communicate insights, Track the outcomes. Then, according to the results, further research questions are put forward.

Through the training of each experimental project, accounting students are trained to gradually establish data analysis thinking.

4.3. Using Diversified Teaching Methods

Big Data Financial Analysis mainly adopts two stages of online and offline, three links in the classroom, and six steps of BOPPPS for blended teaching, as shown in Figure3.

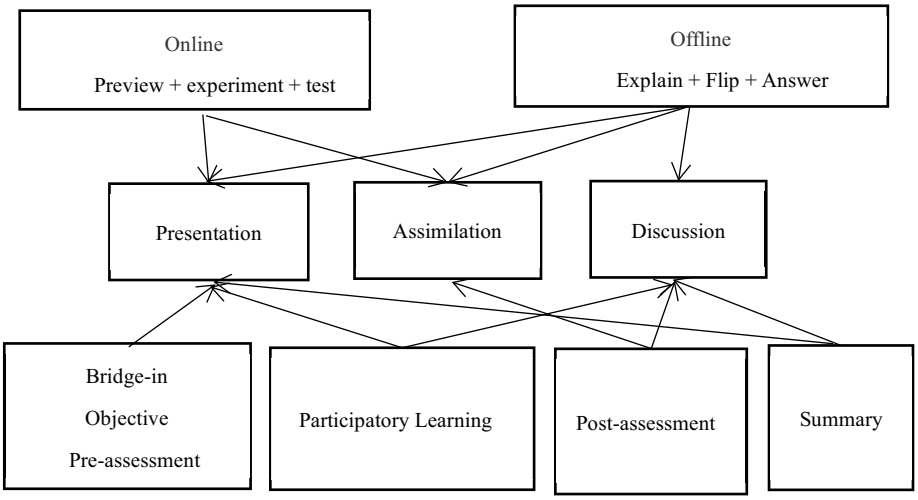


Figure 3. Multi-teaching method design

The classroom examples of multi-teaching mode are as follows:

Table 3. Multi-teaching model example classroom

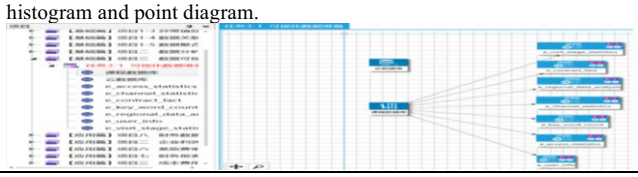
procedure	Examples of first-class teaching activities
Self-study before class (Online)	Introduction and development trend of big data financial analysis, big data thinking and full chain processing workflow.
Bridge-in (Offline)	The installation of DEEP training platform introduces the development prospect of big data financial analysis and mobilizes students' enthusiasm for learning.
Objective (Offline)	Master the visual data processing skills in DEEP, cultivate students' aesthetic ability, drawing ability, data graphic typesetting ability.
Pre-assessment (Offline)	Ask EXCEL drawing types and steps, understand the current knowledge level of students, and answer the difference between EXCEL and DEEP in visualization.
Participatory Learning (Offline)	The teacher explained the knowledge points and demonstrated the DEEP experimental project, and the students conducted independent experiments and group discussions.
Presentation	Data management, data flow creation, grouping table, cross table, detail table, histogram and point diagram. 

Table 3. Multi-teaching model example classroom (Continued)

procedure	Examples of first-class teaching activities
Assimilation	Students complete all the experimental projects in the DEEP system and think about the logical relationship of the data. To be able to demonstrate the experimental project on stage.
Discussion	Group discussion was conducted on the doubtful points of this course, and the problems that could not be solved were submitted to teachers for answers.
Post-assessment (Online +Offline)	Students carry out group experiments and teachers and students evaluate together. The teacher arranges the homework after class, the students complete it independently, and the problem discussion summary is retained in the next class in the classroom discussion [18].
Summary （Offline）	Teachers summarize the knowledge points of this course and comment on the students learning process. Pre-announce the content of the next class, arrange online preview work: thermal point map, line chart, area map, rectangular block map, pie chart, text map.
Afterclass feedback (Online +Offline)	Teachers reflect on the teaching of this course, receive feedback on students learning effects through learning, and optimize and adjust teaching methods and teaching progress.

5. Conclusion

The accounting major in application-oriented universities should keep up with the pace of the times, and the professional construction should move towards big data intelligence, and strive to cultivate application-oriented compound accounting talents with solid professional foundation, reasonable knowledge structure, strong innovation and practice ability and high information literacy. Colleges and universities should attach importance to and strengthen the construction of theoretical courses, practical courses and training bases related to accounting informatization and big data, cooperate with software companies to carry out some related teaching, and combine teaching work, scientific research work with new technologies, new methods, and new tools in the field of practice to achieve coordinated development [19]. Starting from the course of big data financial analysis as the starting point of the cultivation of intelligent compound accounting talents, in the process of exploring the mixed teaching research, in response to the 1 + X certificate system, deepen the cooperation between schools and enterprises, and point to area, the following conclusions are summarized, which can provide reference for the application-oriented undergraduate colleges and universities to improve the training program and curriculum setting and teaching of accounting talents.

1) Blended teaching is student-centered, starting before class, through class and after class. The pre-class activity is an online activity. Students need to complete the teacher s preview task and give the problem to the group supervisor to feedback to the teacher. The classroom activity is the key and difficult point of the teacher s intensive teaching, and the students are divided into groups to carry out the operation steps of the flipped classroom demonstration experiment. After-class activities Students need to complete their homework and conduct mutual evaluation [20].

2) When launching online activities, the teacher publishes courseware, videos and DEEP experimental projects related to pre-class preview, and then the students complete the experimental operation. The teacher divides the students into several groups through the teaching platform, and each group assigns student representatives to be responsible for the organization of online learning activities and the guidance and supervision of offline learning. When launching offline activities, the teacher will elaborate on the key

points and difficulties and demonstrate the DEEP platform to visualize the relevant experimental projects. The team members can submit the problems encountered in their preview to the group discussion group [21].

3) Teachers evaluation of students learning effect: pre-class evaluation, through the way of questions (teachers ask students to answer or students ask each other to answer) to evaluate students' knowledge of last class and the preview of this class; in-class evaluation, explain the new content in the process of constantly throwing problems in order to evaluate the degree of understanding of students and the difficulty of teaching content; after-school evaluation, arrange after-school assignments to evaluate students learning of this class.

Students' evaluation of teachers teaching methods and contents: students can regularly feedback and evaluate the learning effect and teachers teaching methods and progress, including oral feedback, written feedback, platform feedback, group feedback and other forms, improve students' participation in the classroom, help teachers optimize teaching methods and adjust teaching progress in time.

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