Research on the Talent Cultivation Path of Digital and Intelligent Auditing under the OBE Concept

Shiran Shi
Xi'an Innovation College of Yan'an University, Xi'an, Shaanxi, China

Abstract: The era of digital intelligence has prompted the transformation and upgrading of audit talent skill standards. The cultivation of digital audit talents needs to follow the OBE (Outcome-Based Education) concept, reverse-engineering the training path based on job competency standards. On this basis, this study optimizes the digital audit talent cultivation framework, proposing an application-oriented talent training path and a hierarchical optimization strategy that take auditing practical application ability as the core foundation and digital interdisciplinary collaboration as a key approach. The aim is to enhance the cultivation of audit talents in universities and provide multi-skilled talent support for the digital transformation of the auditing industry.

Keywords: Digital and Intelligent Auditing; Interdisciplinary Collaboration; OBE Concept; Four-Dimensional Framework; Progressive Cultivation

1. Introduction

The deep application of digital intelligence technology promotes the transformation of the audit model from risk-oriented auditing to digital intelligence auditing, and the variety of data analysis methods has a significant impact on audit education. Furthermore, the demand for compound audit talents in the audit industry is surging. The data analysis competence is now regarded as a fundamental entry-level requirement for audit practitioners [1], and Generative AI is reshaping the entire audit workflow, which requires auditing education to update curriculum systems and teaching models synchronously to match the changing competence demands [2]. At the same time, the transformation and upgrading of industries such as energy and manufacturing have simultaneously unleashed a combined demand for talent in intelligent auditing and ESG auditing. Under the dual-carbon background, the demand for ESG audit talents continues to expand, and such talents need to have both professional audit competence and digital technical ability [3], which further amplifies the shortage of composite audit talents. However, the current cultivation of auditing talents in universities generally faces the problem that the training system does not align well with industry demands. It is urgently necessary to optimize the talent training framework, strengthen the skill development of intelligent auditing talents, and further adjust the talent supply structure to better match the industry market demands brought by industrial transformation and upgrading. This study, based on the OBE concept, takes the current situation of intelligent auditing talent cultivation as its starting point, optimizes the cultivation path for intelligent auditing talents, and proposes tiered implementation improvement measures.

2. Theoretical Foundation

Outcome-Based Education (OBE) follows the core logic of backward design and forward implementation. Starting from the development of job-related skills, it works backward to design the talent cultivation framework and pathways, aligning the training of digital and intelligent audit talents with job requirements to strengthen the objective of skill development. Applying the OBE concept to the construction of digital auditing curriculum can effectively improve the matching degree between talent training and post competence requirements [4].

The digital and intelligent skills requirements for auditing positions are clearly defined, relying on the precise positioning of training objectives based on job competency requirements to address the mismatch between supply and demand of auditing talent. At the same time, the cultivation of digital and intelligent auditing skills follows a hierarchical and progressive pattern, which aligns with the OBE concept that emphasizes a step-by-step development path. More importantly, with the rapid iteration of

digital and intelligent technologies, the OBE concept upholds the idea of continuous improvement, allowing for timely adjustments according to industry dynamics. The goal-oriented design of OBE can realize precise investment of teaching resources and effectively avoid resource waste caused by homogeneous construction [5].

3. Analysis of the Current State of Digital and Intelligent Audit Talent Development

3.1 The Curriculum System is Disconnected from the Development of Digital and Intelligent Auditing Practices

The current auditing curriculum doesn't integrate digital intelligence technology enough, and course content lags behind industry practice. It also lacks coverage of key development areas in auditing like data asset auditing, information system auditing, and comprehensive auditing.

Most auditing students have basic mastery of digital tools, but lack the ability to apply these tools in specific audit scenarios, and their awareness of AI audit application scenarios is generally insufficient [6]. This is mainly because digital intelligence technology is disconnected from auditing knowledge, and the course setup lacks a step-by-step progression, making it hard for students to build strong digital audit skills. Their knowledge structure struggles to meet the talent skill demands of the industry's digital transformation.

3.2 The Scarcity of Dual-qualified Teachers Restricts the In-depth Development of Digital Intelligence Audit Education

Faculty competence in digital auditing is a key factor restricting the quality of digital transformation of auditing education [7]. Teachers generally lack practical auditing experience, particularly in hands-on capabilities within the field of intelligent auditing. There is a shortage of dual-qualified teachers who possess both auditing expertise and practical intelligent auditing skills, and who are familiar with local auditing needs. An interdisciplinary teaching team has not yet been established, making it difficult to meet the requirements for interdisciplinary instruction in intelligent auditing and the in-depth application of intelligent technologies, thereby hindering the effective implementation of intelligent auditing education.

3.3 Practical Teaching Lacks Real-life Scenarios and Experiential Learning

Practical teaching is a core component in cultivating application-oriented intelligent audit talents. However, there are issues in universities such as outdated audit training platforms, a lack of real business data and local audit cases, and a loose integration of technical operations with audit scenarios, making it difficult for students to conduct full-process practical training in simulated intelligent audit environments. However, Experiential teaching design can significantly improve students' practical perception and operational ability in auditing courses [8]. At the same time, practical teaching lacks layered design, and the cultivation of practical skills does not align well with industry demands, making it difficult to effectively enhance students' digital intelligence auditing skills.

3.4 Insufficient Depth of Data Analysis and Lack of Linkage with Audit Objectives in the Audit Practice Courses

Some universities are at the forefront of optimizing auditing practice courses, which is evidently due to the substantial effort these universities have invested in integrating as much practical training content as possible into the discussion and development of auditing practice courses. However, the data analysis content involved still remains at a superficial level, mainly focusing on financial ratio analysis, trend analysis, peer comparison, and market analysis. Similarly, universities that rely on more practice-oriented auditing software instruction, although these software tools have kept pace with the times and include numerous practical cases, still have data analysis modules that are not comprehensive enough and fail to link auditing procedures with auditing objectives [9]. Therefore, in intelligent auditing education, it is necessary to introduce higher-level models to connect auditing procedures and the data analyses they utilize with the ultimate auditing objectives. This would effectively enable data analysis skills in intelligent auditing to better achieve auditing goals through visualization and intelligent technologies.

4. Optimization of the Talent Development Path for Digital and Intelligent Auditing

Based on the principles of reverse design under the OBE concept, the digital audit skill

requirements for practitioners in the auditing industry are analyzed, a talent training skill checklist is deduced in reverse, and corresponding course modules and practical components are matched to optimize and form a four-dimensional integrated talent training framework comprising courses, competencies, certifications, and literacy.

4.1 Detailed Structure of the Framework

As shown in Table 1, the optimized four-dimensional integrated talent cultivation framework, systematically constructed through a four-way linkage structure of courses–core competencies–certificates–core literacy, aims to address the disconnect between traditional auditing education and the industry's digital and intelligent transformation. At the same time, this framework adopts a six-module course structure, specifically including general foundation courses module layer, discipline foundation courses module layer, professional basic courses module layer, core professional courses module layer, professional extension courses module layer and practical training courses module layer. With each module corresponding to specific competency sets, qualification certificates, and literacy development goals. Each module is designed with a clear progression logic, from foundational to advanced, and from general to specialized.

Table 1. The Four-Dimensional Integrated Talent Training Framework

Courses Module Layer	Core Competences	Certificates	Core Literacy
General foundation	Communication; Creative thinking	Language proficiency	All-round development
Discipline Foundation (Economics, statistics & accounting)	Quantitative analysis & governance cognition	Entry-level accounting qualification	logical thinking
Professional Basics (law basics & auditing principles)	Business analysis, accounting calculation & basic audit cognition	Entry-level audit qualification	Professional ethics
Core Professional (Financial, internal & government audit core modules)	Risk control & Full-scenario audit practice & risk control	CPA, ACCA, CIA & tax advisor	Professional responsibility & risk prevention
Professional Extension (Digital intelligence audit & ESG audit)	Data & AI application in audit, ESG assurance & carbon audit skills	Data analytic & ESG professional	Data security & sustainable development
Practical Training	On-post operation & team collaboration	\	Career adaptability

The modules 4 to 6 are especially important for students' development of smart financial skills. Module 4 is the core professional module, built on the three major audit pillars: CPA auditing, internal auditing, and government auditing. The core courses include taxation, corporate strategic management, financial audit practice, government accounting, government auditing, management accounting, financial statement analysis, performance audit practice, and internal audit practice. It helps students develop all-around auditing practice and risk control abilities. Relevant professional certificates include CPA, ACCA, CIA, and tax advisor, while also fostering a sense of professional responsibility and awareness of risk prevention. And module 5 focuses on professional development, and it's the core part of training students' numerical auditing skills. The professional extension courses module layer includes two sub modules Digital Smart Auditing and Smart Green Auditing. The Digital Smart Auditing sub module mainly covers courses like business data visualization, SQL audit queries, big data audit practices, ERP system auditing, Python data analysis and applications, AI audit applications, and RPA intelligent auditing techniques and practices. The Smart Green Auditing sub module mainly covers courses like carbon accounting, carbon auditing, ESG audit practices, and resource and environmental auditing. This module mainly aims to develop students' ESG data analysis skills, as well as carbon auditing and AI application abilities. Overall, the professional development module aligns with digital and ESG professional certifications, such as CDA Data Analyst, CISA, and ESG Analyst, while also enhancing students' awareness of data security, digital prudence, and sustainable

development literacy. Ultimately, practical training is reinforced through Module 6. It is worth noting that this module should be integrated throughout the entirety of the four-year undergraduate program, including intensive exercises, the graduation thesis, graduation internship, general education practice, interdisciplinary practice, professional practice, and professional internship. This module aims to enhance students' practical operational skills and teamwork abilities, thereby ultimately improving their career adaptability and professional workplace competence.

4.2 Targeted Responses to Current Deficiencies

The framework is specifically designed to address critical deficiencies identified in the current auditing education system.

First, to address the issue of the disconnect between the curriculum system and digital intelligent auditing practice, this framework ensures the implementation of these courses by explicitly introducing advanced artificial intelligence auditing courses, such as RPA intelligent auditing technology and practice, as well as machine learning, within the professional expansion courses module layer, along with the provision of corresponding software and platform support, thereby addressing the problem of insufficient depth in digital intelligent auditing training. At the same time, it addresses the lack of education in digital intelligent green auditing by incorporating courses on carbon auditing, ESG auditing, and related subjects, in response to the growing demand for such capabilities driven by the "dual carbon" strategy [10]. In addition, the progressive teaching structure ensures that digital intelligent auditing skills can develop step by step, from basic tools to advanced applications.

Second, to deal with the lack of teachers who have dual qualifications, the framework suggests creating an interdisciplinary teaching team that mixes audit professors, data science instructors, and industry experts. Since the Professional Extension module depends on specialized digital and ESG courses, it naturally requires teamwork across different fields, which helps bring in and train faculty with both types of expertise. Plus, the practical training module includes industry projects, giving current teachers a chance to work on real audit situations and gradually build up their practical skills. This directly addresses the shortage of teachers who have both auditing knowledge and hands-on intelligent auditing abilities.

Third, to overcome the lagging practical teaching system, the framework addresses the weak integration of industry scenarios and course content. The existing curriculum is often disconnected from real audit practice, with students lacking exposure to authentic audit business scenarios and industry-specific cases. The framework emphasizes scene-embedded teaching design, where specific audit business scenarios are integrated into each level of digital-intelligent courses, and practical training segments promote the application of intelligent digital tools. Moreover, the Practical Training module is embedded throughout the entire four-year undergraduate program, encompassing intensive exercises, graduation thesis, graduation internship, general education practice, interdisciplinary practice, professional practice, and professional internship ensuring that practical training is continuously reinforced rather than concentrated in a single semester.

Fourth, to resolve the insufficient depth of data analysis and its lack of linkage with audit objectives, the framework requires that data analysis courses go beyond surface-level financial ratio analysis and explicitly connect analytical procedures with audit objectives. Courses such as SQL Audit Query, Business Data Visualization, and Big Data Audit Practice are designed to include modules on automated anomaly detection and risk indicator calculation, directly linking data processing outputs to audit risk assessment. Notably, ESG auditing, which centers on the verification, analysis, and attestation of multi-source heterogeneous data, relies on digital technology for data collection and validation [11]. Therefore, ESG auditing skills are positioned at the advanced stage. The framework further mandates that all practical training projects include a clear articulation of how each data analysis technique serves the overarching audit goals, thereby ensuring that students develop the ability to align technical skills with professional judgment rather than merely performing isolated analytical tasks.

As shown in Figure 1, these solutions can be transformed into a progressive capability development chart. The radar chart has six axes, representing the core competency areas,

including communication and innovation, quantitative and governance analysis, business and auditing fundamentals, full-scenario auditing and risk control, application of intelligent auditing skills, and practical operation and collaboration. Figure 1 intuitively illustrates the staged shaping of students' abilities across four training phases. The basic consolidation stage shows a small polygon concentrated in the basic dimensions, directly reflecting the initial focus on building foundational knowledge and familiarity with basic tools. The technical empowerment stage expands outward, particularly in the dimensions of quantitative analysis and digital applications, corresponding to the framework's focus on integrating AI audit courses and data analysis tools as a response to the insufficient depth of digital-intelligent training. The practice deepening stage further extends the polygon across multiple dimensions, illustrating the effect of scenario-based teaching and interdisciplinary practice in bridging the gap between technical skills and real audit situations. The career preparation stage achieves the most extensive and balanced coverage across six dimensions, reflecting the comprehensive student competency profile ultimately formed after systematically addressing the four major deficiencies.

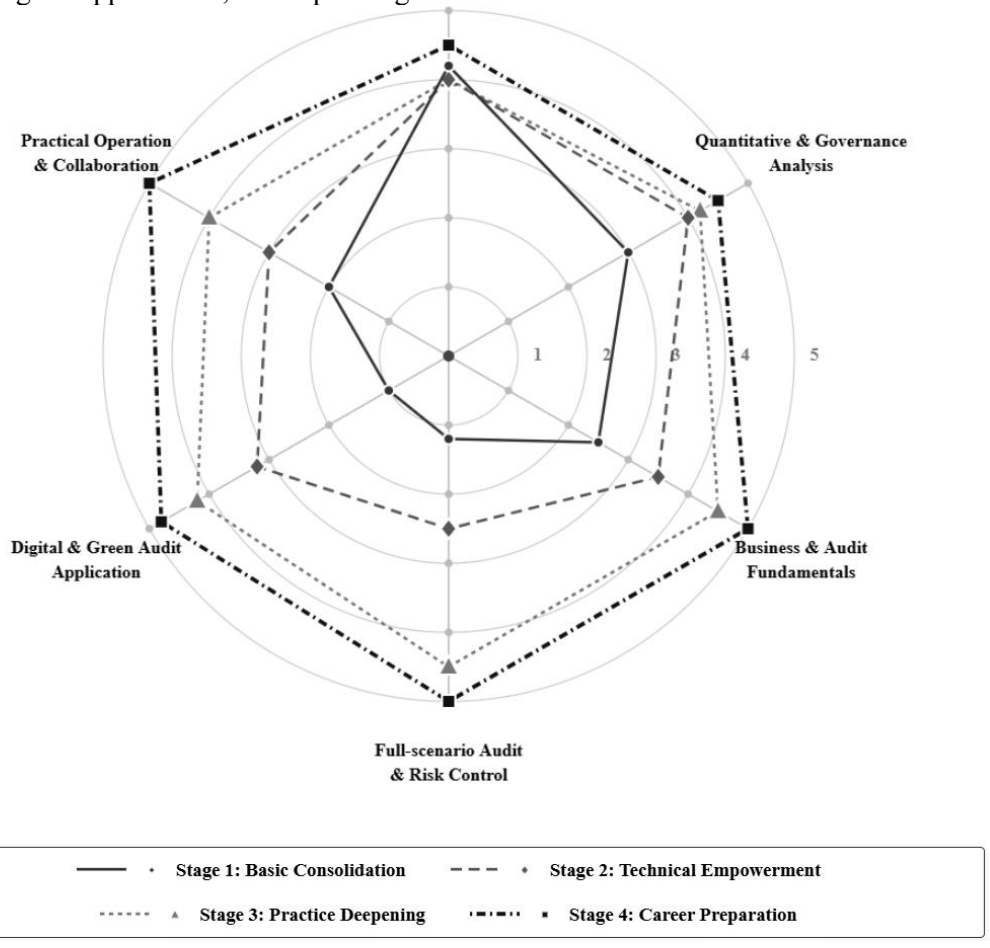

Figure 1. Digital-Intelligent Audit Talent Development Framework Capability Map

4.3 Four-Stage Progressive Capability Development Pathway

The rapid evolution of technology demands that talent cultivation be precisely aligned with industry needs [4]. Furthermore, the digital audit competencies cannot be acquired in a single stage but must be developed through a layered, four-stage pathway, which corresponds to the cognitive development patterns of undergraduate students. The four-stage progressive capability development pathway emphasizes the vertical progression of student capabilities over time. As shown in Figure 2, the optimized talent cultivation framework is further guided by the progressive training points of the OBE concept, forming a four-stage progressive capability development path throughout the undergraduate program. At each stage, the focus is on shaping auditing practice skills, with a hierarchical and

progressive development of digital and intelligent auditing skills.

Figure 2. Four-Stage Development Path for Intelligent Audit Skills

The four-stage progressive capability development pathway focuses on auditing practical application skills as the core foundation and uses digital interdisciplinary collaboration as the key approach for a practical talent development path and layered optimization strategy. Specifically, the enlightenment stage focuses on building foundational audit knowledge and introductory digital tool familiarity. Students develop core competencies in business and audit fundamentals, establishing a solid base for subsequent technical learning. The foundation-building stage shifts the emphasis toward quantitative analysis and digital application skills, enabling students to master technical tools such as SQL, Python and build data visualization capabilities, thus realizing the integration of digital tools and audit practices. The application stage integrates technical skills with practical audit scenarios through scene-embedded teaching and interdisciplinary projects. Students deepen their understanding of big data audit practices and conduct in-depth training in intelligent audit projects with the implementation of RPA and AI audit tools. The implementation stage achieves the comprehensive integration of all competency dimensions. Students participate in targeted internships in digital-intelligent positions and complete digital-intelligent graduation designs, realizing the precise connection between their capabilities and job requirements.

This interdisciplinary design ensures that students develop a composite skill set essential for modern audit practice. As audit practice increasingly integrates with data science, information systems, and environmental economics, the four-stage pathway progressively

incorporates these interdisciplinary elements. In the early stages, students build foundational knowledge in statistics and accounting. In the intermediate stages, they engage with data analytics and programming. And in the later stages, they apply these skills to specialized domains such as ESG auditing and information system auditing. These courses and applications are built upon the digital auditing competencies developed in the previous three stages. This hierarchical design ensures that each stage prepares students for the next, creating a coherent and cumulative learning experience.

5. Research Conclusions

The Four-dimensional Integrated Talent Training Framework represents a systematic and innovative approach to cultivating application-oriented intelligent audit talents in the digital era. By integrating courses, competencies, certificates, and literacy into a coherent structure, and by aligning the framework with the OBE philosophy, industry demands, and regional economic development strategies, the framework effectively addresses the current deficiencies in auditing education. It provides a practical pathway for higher education institutions to produce graduates who are not only proficient in traditional audit knowledge but also equipped with advanced digital-intelligent skills and green audit capabilities, thereby meeting the urgent talent needs of the auditing industry in the context of digital transformation and sustainable development.

Furthermore, the progressive four-stage development pathway — Basic Consolidation, Technical Empowerment, Practice Deepening, and Career Preparation — ensures that students acquire digital and intelligent audit competencies in a structured, step-by-step manner that aligns with their cognitive development. This staged approach allows for targeted skill building at each phase, with earlier stages focusing on foundational knowledge and tool familiarity, intermediate stages emphasizing technical application and programming capabilities, and later stages integrating comprehensive audit practice and career readiness. The explicit linkage between course modules, competency sets, professional certifications, and literacy development creates a transparent pathway for students to understand their learning journey and career progression. This integrated design also facilitates continuous curriculum improvement, as feedback from certification outcomes, internship performance, and graduate employment can be systematically fed back into course content and teaching method adjustments, ensuring the framework remains responsive to evolving industry needs and technological advancements.

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