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Innovation and practice of interdisciplinary training mode for auditing talents in application-oriented universities under the empowerment of digital intelligence

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In the digital-intelligent era, emerging technologies like big data and block chain have revolutionized auditing, demanding talents with interdisciplinary competencies. Focusing on application-oriented undergraduate auditing programs, this study integrates Interdisciplinary Education Theory, Constructivist Learning Theory, and Human Capital Theory. Based on interviews with 22 experts and surveys of 52 teachers and 198 students from 12 universities, it identifies dilemmas including outdated concepts, low curriculum integration, weak faculty, and insufficient practical resources. A training model featuring interdisciplinary curriculum integration, industry-education collaboration, and faculty co-construction is proposed, validated by Mianyang Teachers' College's successful practice. This research provides theoretical and practical guidance for optimizing auditing talent training in application-oriented universities.

KEYWORDS

application-oriented undergraduate institutions, auditing talents, digital-intelligent era, industry-academia integration, interdisciplinary training

1 Introduction

Application-oriented undergraduate institutions aim to cultivate practical talents satisfying social needs. The auditing major, characterized by high practicality and application value in modern enterprise organizations, constitutes a key disciplinary field for talent cultivation in these institutions. In the digital-intelligent era, emerging technologies such as big data, artificial intelligence, and block chain have been increasingly applied in the auditing field. Big data technology enables rapid collection, storage, and analysis of massive auditing data, significantly enhancing auditing efficiency and accuracy. Block chain technology ensures the authenticity, integrity, and immutability of auditing data, providing a solid technical guarantee for audit supervision (Yang et al., 2022). However, the application of these technologies cannot be supported by knowledge from a single discipline but requires the in-depth integration of knowledge from multiple disciplines such as computer science, mathematics, statistics, and auditing.

Therefore, the digital-intelligent era has raised higher demands on auditing talents, requiring them to possess multidisciplinary knowledge and comprehensive capabilities

(Liu, 2024; Feng, 2020). This study clearly identifies the following two core research questions:

RQ1: What are the key dilemmas in the interdisciplinary training of auditing talents in applied undergraduate universities in the digital-intelligent era?

RQ2: How to construct an interdisciplinary training model for auditing talents that meets industry demands and the educational orientation of applied undergraduate universities, and verify its feasibility and effectiveness through practical application?

Existing research on interdisciplinary education in auditing has mostly focused on comprehensive universities of finance and economics, with an emphasis on theoretical curriculum integration. Empirical studies and practical verification targeting applied undergraduate universities remain limited, and few studies align well with their practice-oriented educational mission.

Against this research gap, the core strengths of this study are threefold. First, it adopts a targeted research perspective by focusing on applied undergraduate universities, filling the vacancy in the literature related to institutional types in interdisciplinary auditing talent training. Second, it employs empirical methods that integrate multi-stakeholder surveys, interviews, and institutional case studies, enabling conclusions supported by both theory and practice. Third, it delivers practically applicable results: the training model constructed matches industry demands and institutional realities, providing direct guidance for the digital transformation of auditing programs in applied undergraduate universities.

Addressing the core research questions, this study identifies key challenges in interdisciplinary training, develops a tailored model consistent with the practice-oriented positioning of applied undergraduate universities, and verifies its effectiveness through practical implementation. It aims to provide policy implications for the cultivation of applied auditing talents in higher education and to promote the reform of interdisciplinary auditing education in the digital-intelligent era.

2 Theoretical basis

The construction of an interdisciplinary training model for application-oriented undergraduate auditing talents in the digital-intelligent era is not a simple superposition of teaching links or adjustment of curriculum content, but a systematic reform supported by multi-disciplinary theories, combined with the transformation needs of the auditing industry and the positioning of application-oriented undergraduate education. Clarifying the following three core theoretical frameworks can provide solid academic support for the rationality and scientificity of the training model.

2.1 Interdisciplinary education theory

Interdisciplinary Education Theory originated from the higher education reform movement in the mid-20th century. Its core viewpoint is to break down traditional disciplinary barriers and cultivate students' comprehensive ability to solve complex practical problems through the intersection, integration, and reconstruction of multi-disciplinary knowledge (Qiao et al., 2025). This theory emphasizes the dual goals of "knowledge integration" and "thinking leap": on the one hand, forming new

knowledge modules through the organic combination of different disciplinary knowledge systems; on the other hand, guiding students to break through the limitations of single-disciplinary thinking and form a thinking mode of "multi-perspective analysis—cross-field correlation—systematic solution." Interdisciplinary Education Theory divides talent training into three levels: intersection level, integration level, and transcendence level. The training of application-oriented undergraduate auditing talents should take the "integration level" as the core goal, avoid staying at the simple intersection of "auditing courses + technical courses," and realize the transformation of knowledge into practical ability.

2.2 Constructivist learning theory

Constructivist Learning Theory was first proposed by Jean Piaget, a renowned Swiss psychologist. In his view, human cognitive structure is not static but is always in a continuous process of construction and evolution. Essentially, the learning process is actually a process of continuous cognitive reconstruction. Yang Weidong pointed out that this idea has been gradually developed and improved through the continuous research of many educators such as Lev Vygotsky and Jerome Bruner, eventually forming a complete system of Constructivist Learning Theory (Fan, 2022). The core essence of constructivism mainly includes the following key aspects: from the perspective of knowledge view, it emphasizes that knowledge is not passively accepted by learners but acquired through their own active construction; in terms of learning view, the learning process is regarded as a process in which learners actively construct knowledge through a series of active behaviors, such as inquiry, experiment, and reflection; from the perspective of student view, the theory proposes that learners can complete knowledge construction more efficiently through cooperation with others and active participation in discussions. In the field of higher education, Constructivist Learning Theory has promoted the transformation of teaching models from "teacher-centered teaching" to "student-centered inquiry." It advocates that through case teaching, project-based learning, practical training, and other methods, students can independently integrate knowledge and improve their abilities in the process of solving real problems.

2.3 Human capital theory

Human Capital Theory was proposed by scholars such as Theodore W. Schultz and Gary S. Becker. Its core viewpoint is that human capital refers to intangible capital, such as knowledge, skills, and abilities, embodied in workers. Its formation depends on investment activities, such as education, training, and practice, and can realize value appreciation through the labor production process (Lu, 2025). This theory emphasizes the "targeted nature of educational investment"—educational activities need to match market demand and industry development to maximize the output efficiency of human capital. In the field of vocational education, Human Capital Theory advocates that talent training in higher education should accurately align with the human capital needs of the industry. By optimizing the structure of educational investment, it can improve workers' "job adaptability" and "sustainable development ability" and reduce the retraining costs of employers.

The above three theories all provide support for this research. Interdisciplinary Education Theory provides a logical basis for the construction of the curriculum system and theoretical support for the design of the curriculum cluster of "core auditing major + digital-intelligent technology support + industry scenario application." At the same time, it provides a positioning basis for the training objectives, clarifying

that the core competitiveness of auditing talents in the digital-intelligent era is not “proficiency in a single discipline” but “interdisciplinary integration and application.” Constructivist Learning Theory provides theoretical support for the design of practical teaching. The practical links in the training model, such as “school-enterprise co-construction of training bases,” “digital-intelligent audit simulation projects,” and “discipline competition-driven,” are all designed with Constructivist Learning Theory as the core. Human Capital Theory provides a value orientation for the training model and a theoretical basis for the positioning of the training model as “industry demand-oriented.” The human capital demand of the auditing industry in the digital-intelligent era has shifted from “traditional financial and accounting skills” to “interdisciplinary digital-intelligent skills.” Therefore, the training model takes “digital-intelligent audit practical ability” and “industry-specific audit ability” as the core training content. Essentially, it improves the human capital value of students through targeted educational investment, enabling them to quickly adapt to the needs of auditing positions and reduce the mismatch between industry talent supply and demand.

3 Analysis of audit transformation and new talent demands in the digital-intelligent era based on expert interviews

To further verify the practical feasibility, industry adaptability, and optimization direction of the interdisciplinary talent training model for application-oriented undergraduate auditing constructed in this study, this study conducted in-depth industry-university-research expert interviews from June to August 2024. The interviewees included 22 scholars in the field of audit education, practical experts in the audit industry, and heads of corporate human resources. Through semi-structured interviews, sufficient exchanges were conducted around core issues, forming the following key conclusions.

3.1 Interview design and expert opinions

3.1.1 Interview framework

The interview focused on three core dimensions: first, the core demands and changing trends of the audit industry for talent capabilities in the digital-intelligent era; second, the feasibility and implementation difficulties of the proposed interdisciplinary training model (including curriculum integration, practical support, and faculty development); third, the optimization suggestions and implementation guarantee measures for the training model. The duration of each interview was 60–90 min. The entire process was recorded and transcribed into text materials, and key opinions were extracted using coding analysis.

3.1.2 Expert composition and basic opinions

The results of the expert interviews are shown in [Table 1](#).

3.1.3 Interview insights

The in-depth expert interviews have fully verified the feasibility and adaptability of the constructed interdisciplinary training model. Core measures, including the curriculum system, practical pathways,

and faculty development, are not only aligned with educational principles at the academic level but also meet talent requirements at the industry level. Meanwhile, the issues highlighted by experts—such as “insufficient curriculum contextualization,” “restrictions on data security and compliance,” and “lack of soft skill training”—have provided clear directions for optimizing the model.

3.2 Auditing transformation and new talent demands in the digital-intelligent era

3.2.1 Technologically-driven changes in auditing paradigms

3.2.1.1 Reform in auditing data collection and storage

In the traditional auditing model, auditors mainly obtain structured data from the financial systems of audited entities. The data sources are relatively single, and the collection process relies on manual operations with low efficiency. In the digital-intelligent era, auditing data sources have become more extensive and diverse. In addition to traditional financial data, they also include unstructured data such as business data, log data, and social media data. Meanwhile, cloud storage technology provides a reliable solution for storing massive amounts of data, breaking the capacity limitation of local storage, realizing real-time data sharing and backup, and greatly improving the efficiency and security of data collection and storage.

3.2.1.2 Innovation in auditing data analysis methods

The traditional sampling auditing method, based on the principles of probability theory and mathematical statistics, selects partial samples for analysis to infer the overall characteristics. This method, when faced with massive data, struggles to identify potential risks hidden in the data. In the digital-intelligent era, auditors, with the help of data mining, machine learning, and other technologies, can analyze the entire volume of data and explore the correlations and abnormal patterns among data.

3.2.1.3 Expansion of auditing scope

In addition to traditional financial auditing, emerging fields such as information system auditing, data security auditing, and network security auditing have gradually become important components of auditing work. Information system auditing focuses on the security, reliability, and effectiveness of the information systems of audited entities, ensuring the normal operation of the systems and preventing data leakage or tampering. Data security auditing mainly examines the processes of data collection, storage, transmission, and usage to ensure data compliance and security. Network security auditing primarily assesses the security of enterprise network environments, preventing network attacks and data leakage risks.

3.3 New demands for professional auditing talents

3.3.1 Technical competency requirements

3.3.1.1 Data analysis and mining skills

The characteristic of large-scale data in the digital-intelligent era has placed more stringent requirements on auditors’ data analysis

TABLE 1 Expert interviews.

Expert type	Number of experts	Core viewpoints	Suggestions
Academic experts from universities	8	1. The digital-intelligent transformation has forced audit education to shift from a “single discipline” to “interdisciplinary integration”; 2. The curriculum system of “Audit + Computer Science + Statistics + Industry Scenarios” is in line with the “practice-oriented” training objective of application-oriented talents, avoiding the shortcoming of pure academic institutions that emphasize theory over application.	1. Set up “Interdisciplinary Integration Case Courses,” where teachers from multiple disciplines jointly develop real project cases; 2. Recruit senior auditors with interdisciplinary backgrounds from enterprises; 3. Revise the curriculum syllabus jointly with industry experts every 1–2 years to ensure that the teaching content keeps pace with the industry frontier.
Practical experts in the audit industry	10	1. In current audit projects, more than 60% of core work relies on data analysis and information system verification capabilities. Talents with pure finance and accounting backgrounds can no longer meet the needs of “full-volume data auditing” and “real-time risk monitoring”; 2. Emerging businesses such as data security auditing and block chain transaction auditing require auditors to have a good command of both compliance regulations and technical principles.	1. Set up courses on “Technology Application in Audit Scenarios”; 2. Establish a “school-enterprise dual-tutor system,” where enterprise experts can participate in teaching through online lectures, offline workshops and other forms.
Corporate human resources/recruitment experts	4	The most valued composite capabilities in recruitment are “audit thinking + technical tools + industry cognition.”	1. It is suggested that students should participate in data processing and audit process work of real enterprise audit projects during their studies; 2. It is suggested that universities and enterprises should jointly develop a “simulated audit platform” to restore real business scenarios and data logic; 3. It is suggested that universities should set up industry-oriented modules according to regional industrial characteristics to improve the matching degree between talent supply and demand; 4. It is suggested that training such as “audit communication skills” and “data storytelling presentation” should be added to the training model.

capabilities. Auditors must master new technologies and tools to collect, organize, analyze, and visually present large amounts of structured and unstructured data. Through data analysis, they can identify abnormal patterns, trends, and correlations in the data, providing clues and evidence for auditing work and improving auditing efficiency and accuracy (Tang et al., 2020; Zhong and Shen, 2017).

3.3.1.2 Information system auditing and digital tool application capabilities

With the widespread application of enterprise information systems, modern enterprises expect auditors to be familiar with the operating principles and internal control mechanisms of various information systems, capable of auditing information systems and evaluating their security, reliability, and compliance. Meanwhile, proficient use of digital auditing tools and platforms can enhance the efficiency and effectiveness of auditing work.

3.3.2 Professional knowledge requirements

3.3.2.1 Industry-specific knowledge

With the deepening of digital transformation in different industries, auditors need to possess business knowledge and understanding of operational processes specific to certain industries. For example, in financial industry auditing, they should be familiar with the application of financial technology and the transaction processes of digital

currencies; in e-commerce industry auditing, they need to understand the operating models of e-commerce platforms and the risk characteristics of online transactions.

3.3.2.2 Interdisciplinary knowledge

In addition to traditional professional knowledge such as auditing and accounting, auditors also need to have interdisciplinary knowledge in computer science, information technology, data analysis, economics, management, and statistics. For instance, understanding information technology knowledge such as database management, network security, and data encryption, and mastering sampling methods and data analysis models in statistics, can help them better cope with complex problems in auditing work in the digital-intelligent era.

4 Analysis of interdisciplinary training dilemmas based on surveys of auditing faculty and students

4.1 Survey design and core dimensions

To accurately grasp the cognitive status, competence level, and training needs of faculty and students in auditing majors at application-oriented undergraduate institutions regarding digital-intelligent

and interdisciplinary audit education, and to provide empirical support for optimizing the talent training model, this study conducted a special survey covering 12 application-oriented undergraduate institutions nationwide from March to May 2024. The survey respondents included 56 faculty members and 212 undergraduate students majoring in auditing and related fields. Adopting a combination of online questionnaires and offline interviews, a total of 52 valid faculty questionnaires and 198 valid student questionnaires were collected, and 16 representative faculty and students were interviewed.

To further improve the research methodology and enhance the persuasiveness of the conclusions, this study supplements objective indicators for measuring student outcomes by constructing a three-dimensional system consisting of skills, qualifications, and employment, which complements the subjective survey data. Specifically, at the skill level, practical assessment scores of digital-intelligent auditing skills were collected from auditing majors at the surveyed institutions. At the qualification level, data on the acquisition of audit-related professional qualifications were compiled. At the employment level, information was gathered on the one-year employment rate of graduates in audit-related positions and employers' quantitative evaluations of graduates' interdisciplinary competencies. All data for the above objective indicators were obtained from the educational administration systems of the surveyed universities, graduate employment statistics, and employer feedback questionnaires, ensuring data authenticity and verifiability, and remedying the over-reliance on subjective measurements of student outcomes in the original research design.

4.1.1 Composition of survey respondents and basic opinions

The results of the survey are shown in Table 2. This survey confirms the practical dilemmas of digital-intelligent and interdisciplinary audit education in application-oriented undergraduate institutions: faculty and students have a high degree of recognition and actual demand for interdisciplinary education, but insufficient cognitive depth and weak interdisciplinary skills. Problems such as low integration of the curriculum system, shortage of faculty resources, and lack of practical resources seriously restrict the training quality, resulting in a significant gap between talent training and industry demand.

4.2 Difficulties in interdisciplinary cultivation of auditing talents in application-oriented undergraduate institutions

4.2.1 Insufficient interdisciplinary development

4.2.1.1 Inadequate emphasis on interdisciplinary in training concepts

Some application-oriented undergraduate institutions do not attach sufficient importance to interdisciplinary development in their auditing talent training concepts and have an inadequate understanding of the connotation of interdisciplinary talents in the auditing major. They simply consider interdisciplinary talents as those who master basic knowledge of multiple disciplines, while neglecting the integration and application capabilities of knowledge across disciplines. For example, in the training process, courses of auditing, statistics, law, computer science, and other related disciplines may be simply pieced together, without focusing on cultivating students'

ability to comprehensively apply knowledge from these disciplines to solve complex problems in actual auditing work.

4.2.1.2 Low proportion and poor integration of interdisciplinary courses

Currently, in the process of constructing the curriculum system for the auditing major in many application-oriented undergraduate institutions, they are still constrained by the traditional concept that "auditing is merely audit examination," resulting in many irrationalities in the constructed curriculum system. For example, theoretical courses in auditing account for a large proportion of credits, while courses highly aligned with the actual needs of the industry, such as computer auditing and big data auditing, are mostly set as elective courses with a small credit proportion. Moreover, the interdisciplinary integration capability is generally insufficient. Even if some interdisciplinary courses are offered, they often exist in isolation with low integration.

4.2.1.3 Lack of interdisciplinary training mechanisms

There is a general lack of sound interdisciplinary talent training mechanisms, such as systems and measures for interdisciplinary program setup, interdisciplinary curriculum system construction, and interdisciplinary faculty team building. Meanwhile, in aspects such as teaching management and student assessment and evaluation, incentive mechanisms conducive to interdisciplinary development have not been formed, affecting the enthusiasm of students and teachers to participate in interdisciplinary learning and teaching.

4.2.2 Weak faculty strength

4.2.2.1 Insufficient interdisciplinary knowledge reserve

In application-oriented undergraduate institutions, most teachers have profound attainments only in a single discipline field such as auditing or its related disciplines, lacking an interdisciplinary knowledge system. Some teachers, although possessing relevant theoretical knowledge and practical experience, have insufficient understanding of information technologies such as big data and artificial intelligence. Others, despite recognizing the importance of information technologies, their understanding remains at the theoretical level, making it difficult to integrate them with the auditing knowledge system.

4.2.2.2 Imperfect faculty recruitment mechanisms

Application-oriented undergraduate institutions face many difficulties in attracting auditing professionals with interdisciplinary backgrounds. Compared with comprehensive universities, they have gaps in academic reputation, research conditions, etc., making it difficult to attract high-end talents who have both solid auditing professional knowledge and interdisciplinary backgrounds. For a long time, the sources of auditing professional faculty in application-oriented undergraduate institutions have mainly been two channels. Firstly, college graduates directly enter the teaching profession. Although these teachers have a solid theoretical foundation, they have obvious deficiencies in practical experience in enterprise operations, resulting in weak practical teaching capabilities. Secondly, faculty members come from

TABLE 2 Surveys of auditing faculty and students.

Identity	Cognition	Needs	Existing problems
Faculty	1. 91.3% of faculty members believe that “auditing talents in the digital-intelligent era must possess interdisciplinary capabilities”; 2. 87.8% of faculty members support that “auditing majors should strengthen interdisciplinary courses such as computer science and statistics”; 3. 63.4% of faculty members simply understand “interdisciplinary training” as “adding technical courses”; 4. 28.5% of faculty members recognize the core value of “knowledge integration and application” and “interdisciplinary thinking cultivation”; 5. 45.9% of faculty members have limited understanding of industry application scenarios in cutting-edge fields such as “block chain auditing” and “AI anomaly identification.”	1. Training on practical digital-intelligent auditing skills, with a demand ratio of 89.5%; 2. Training on interdisciplinary curriculum design methods, with a demand ratio of 78.2%; 3. Sharing of cutting-edge industry scenarios, with a demand ratio of 72.1%; 4. Guidance on collaboration models of interdisciplinary teaching teams, with a demand ratio of 63.4%.	1. Curriculum system Issues: 82.6% of faculty members believe that the proportion of interdisciplinary courses is too low; 2. Faculty Resource Issues: 79.7% of faculty members consider the shortage of faculty with interdisciplinary backgrounds as the primary obstacle; 3. Resource Issues: 67.4% of faculty members indicate that “the update of equipment in on-campus auditing laboratories is lagging behind.”
Students	1. Industry Cognition: 76.5% of students are aware that “big data and AI have been widely applied in auditing work,” but only 32.4% of students can clearly describe “the core job content of digital-intelligent auditors”; 2. Learning Cognition: 82.6% of students are willing to take interdisciplinary courses, but 67.8% of students’ primary motivation for choosing courses is “enhancing employability,” and only 19.3% of students are motivated by the interest in “exploring the integration of interdisciplinary knowledge.”	1. Increasing practical courses, with a demand ratio of 92.3%; 2. Introducing real enterprise case teaching, with a demand ratio of 87.6%; 3. Strengthening basic tool courses, with a demand ratio of 85.4%; 4. Expanding industry-oriented courses, with a demand ratio of 76.8%; 5. Adding interdisciplinary practical projects, with a demand ratio of 73.5%.	1. Curriculum System Issues: 76.1% of students report that “there is a lack of connection between courses”; 2. Faculty Resource Issues: 64.5% of students report that “some faculty can only explain theories but cannot guide practical operations”; 3. Resource Issues: 78.3% of students report that “it is difficult to access core digital-intelligent auditing businesses during off-campus internships.”

part-time teachers or transferred teachers from practical departments. These teachers have rich practical experience and can relatively well integrate theoretical knowledge with practical operations, but their in-depth mastery of theoretical knowledge and flexible application of teaching methods still need to be further improved.

5 Construction of interdisciplinary talent training model for auditing in application-oriented undergraduate institutions

5.1 Promoting interdisciplinary integration in the auditing major

5.1.1 Optimizing curriculum system setup

Promote interdisciplinary and inter-departmental teaching cooperation, integrate knowledge from multiple disciplines such as auditing, computer science, statistics, and law, construct four core course clusters centered on auditing professional courses, computer courses, mathematics and statistics courses, and innovative practice (training) courses, and set up core courses such as “Digital Auditing Technology and Application,” “Audit Data Analysis and Mining,” and “Audit Laws and Compliance Practice” (Wu and Chen, 2022); (Ma, 2023).

Offer special digital-intelligent auditing practice courses, such as “Big Data Auditing Practice,” “Information System Auditing Training,” and “Intelligent Auditing Application Practice.” The course content

closely focuses on the actual needs of auditing work in the digital-intelligent era, setting up teaching links such as real case analysis and simulated project operation.

Reasonably arrange the sequence and teaching content of practical courses to ensure that each practical course is connected and progressive. Firstly, consolidate students’ basic auditing skills through basic auditing practice courses, and then gradually introduce digital-intelligent auditing practice courses to enhance students’ ability to use digital-intelligent technologies to solve auditing problems.

5.1.2 Cultivating students’ interdisciplinary thinking and abilities

Guide students to establish awareness of interdisciplinary learning and encourage them to independently learn and explore knowledge in different disciplinary fields. Schools can provide rich online learning resources, academic lectures, and academic exchange activities to create a good independent learning environment for students.

Through discipline competitions, group projects, team practices, and other activities, enable students to learn to effectively communicate and collaborate with classmates from different disciplinary backgrounds to jointly complete learning tasks.

5.2 Strengthening guarantee for auditing practical teaching

5.2.1 Optimizing the construction of practical teaching resources

Increase capital investment in auditing laboratories, such as purchasing advanced digital-intelligent auditing equipment and software,

equipping powerful big data auditing analysis platforms, introducing intelligent auditing robot development kits, and updating information system auditing tools (Dong et al., 2023; Kong et al., 2022).

5.2.2 Promoting in-depth industry-university-research cooperation

It is necessary to actively establish long-term and stable cooperative relationships with various enterprises, accounting firms, financial institutions, and other entities, so as to expand the quantity and types of off-campus internship bases. Jointly formulate internship plans and assessment standards with cooperative units to ensure that students can truly participate in practical audit projects during their internships. In particular, establish cooperation platforms with enterprises equipped with intelligent audit systems. By arranging for students to participate in enterprise research and intensive internships, students can understand the connection between enterprise operations and auditing, intuitively experience the application of new technologies in the auditing field, thereby improving their practical operation capabilities (Sun and Zhao, 2023).

5.3 Strengthening the construction of auditing professional faculty team

5.3.1 Optimizing faculty recruitment mechanisms

Proactively introduce professionals with interdisciplinary backgrounds in computer science, information technology, statistics, law, etc., who have an in-depth understanding of auditing, to strengthen the overall strength of the digital-intelligent technology teaching team and promote the optimization of the faculty structure (Wu and Chen, 2022). It is also possible to recruit senior auditors with rich practical experience and enterprise internal audit supervisors from the auditing practice field.

5.3.2 Enhancing teachers' professional literacy and practical capabilities

Organize on-campus auditing professional teachers to participate in training courses on digital-intelligent technologies such as big data auditing, artificial intelligence auditing, and the application of block chain technology in auditing. Teachers can also be selected to participate in enterprise practice training, and a mechanism for teachers to take temporary positions in practical units such as enterprises and accounting firms on a regular basis should be established.

5.3.3 Promoting communication and cooperation among teachers

Break disciplinary barriers to form interdisciplinary teaching teams, consisting of teachers from different disciplines such as auditing, computer science, and law. Teachers can communicate with each other, share knowledge and experience, and jointly solve problems in interdisciplinary teaching to improve teaching quality.

Regular on-campus auditing academic seminars can be held to encourage teachers to share their research results and teaching experience in the field of digital-intelligent auditing. Organize teachers to participate in high-level domestic and foreign auditing academic conferences to broaden their academic horizons and understand the cutting-edge research trends in the industry.

6 Mianyang Teachers' College: practice of digital-intelligent audit talent training based on "curriculum integration + industry-education collaboration"

As a representative of application-oriented undergraduate institutions in Southwest China, the School of Digital Economics and Management of Mianyang Teachers' College initiated an interdisciplinary talent training reform in 2021 in response to the demand for digital-intelligent transformation of the auditing discipline. This reform has formulated a training model characterized by "three-dimensional integration and dual-track practice." To date, over 300 graduates have been cultivated, among whom 85% have secured positions in relevant fields such as accounting firms and financial technology enterprises. The satisfaction rate of employers with students' digital-intelligent technology application capabilities has reached 92% (Wang et al., 2025).

6.1 Reconstruction of the interdisciplinary curriculum system

The School of Digital Economics and Management defines the training objective of auditing talents as fostering "digital application talents" and "digital management talents." It has implemented digital-intelligent transformation of the curriculum system, adhering to the philosophy of "integrating five educational dimensions in interdisciplinary general education courses, sharing basic courses across economics, management, and law disciplines, aligning specialized courses with digital-intelligent job roles, and linking practical training with digital-intelligent projects." Within the shared basic course module for economics, management, and law disciplines, digital-intelligent technology courses such as Python Programming are incorporated to equip students with basic data analysis tools. In the specialized course module, digital-intelligent courses, including Big Data Auditing, are integrated according to different career pathways, enabling students to gain an in-depth understanding of the technical applications in auditing practices in the digital-intelligent era. Meanwhile, the school has developed a digital economy course cluster centered on digital-intelligent auditing, complemented by featured courses such as the Python+ course cluster and Big Data Auditing. This initiative broadens students' knowledge boundaries and achieves the integration of auditing with multi-disciplinary knowledge, including technology and management.

6.2 Construction of practical teaching platforms

Mianyang Teachers' College has invested over 8 million yuan in establishing a "Digital-Intelligent Audit Training Center," equipped with professional facilities such as a big data audit analysis platform, intelligent audit robots, and a block chain audit simulation system. Additionally, a desensitized database of real audit data from accounting firms has been introduced to support students in conducting full-process digital audit training. Relying on its existing disciplines and faculty team, the School of Digital Economics and Management has jointly established a Digital Economy Industry

College with institutions including UFIDA NEOIT, China Academy of Information and Communications Technology (Chengdu-Chongqing Branch), Shanghai Gaodun Education, Science and Technology City Digital Economy Industry Innovation Research Institute, and Mianyang Industrial Park. This collaboration provides high-quality practical training platforms for students majoring in auditing. Through close cooperation with enterprises, students can participate in real digital-intelligent audit projects, accumulate practical experience, and enhance their ability to address practical problems.

6.3 Measures for faculty development

The School of Digital Economics and Management has recruited 5 full-time teachers with a computer science background and Certified Public Accountant (CPA) qualifications, and appointed 3 senior auditors with extensive practical experience in digital-intelligent auditing from enterprises as part-time teachers. For existing faculty members, the school has implemented a “Digital-Intelligent Competence Enhancement Program.” Each year, more than 10 auditing teachers are selected to participate in specialized training programs on big data auditing and artificial intelligence auditing. Teachers are also arranged to take temporary positions in cooperative enterprises and engage in actual audit projects to accumulate practical experience. Furthermore, interdisciplinary teaching teams have been established, consisting of teachers from disciplines such as auditing, computer science, and statistics, who jointly conduct teaching research and curriculum development. Regular interdisciplinary teaching seminars are organized to share teaching experiences and research outcomes, thereby improving the quality of interdisciplinary teaching.

The interdisciplinary training practice of digital-intelligent auditing at Mianyang Teachers’ College offers valuable insights for other similar institutions. Firstly, interdisciplinary talent training should take curriculum system reconstruction as the core. It is essential to break disciplinary barriers, integrate multi-disciplinary knowledge, and design highly integrated and practical courses to ensure that students acquire the interdisciplinary knowledge and skills required for auditing work in the digital-intelligent era. Secondly, practical teaching is crucial for enhancing students’ interdisciplinary application capabilities. Efforts should be made to strengthen the construction of on-campus and off-campus practical teaching platforms, deepen industry-university-research collaboration, and provide students with real practical scenarios and project resources. This enables students to enhance their ability to solve complex problems through practice. Thirdly, faculty development serves as the guarantee for interdisciplinary training. It is necessary to build a faculty team with interdisciplinary knowledge and practical experience through multiple approaches, including recruitment, training, and appointment. Establishing interdisciplinary teaching teams is also vital to improve the level of interdisciplinary teaching. Fourthly, the multi-party collaborative education mechanism can integrate resources from various stakeholders, form a synergy in talent training, and enhance the pertinence and effectiveness of talent cultivation. Application-oriented undergraduate institutions should actively construct collaborative education platforms, strengthen cooperation with governments, enterprises, and industry associations, and jointly promote the interdisciplinary training of auditing talents.

7 Research validity, limitations and future research prospects

7.1 Validity analysis of research results

Considering the disciplinary characteristics of applied research in auditing, this study ensures the scientificity and reliability of the conclusions from three core dimensions: content validity, construct validity, and criterion validity. Content validity is guaranteed by expert review of the questionnaires and interview outlines, which are closely aligned with the core research topics. Construct validity is achieved by establishing a research framework based on three major theories, realizing the logical consistency between theory and empirical evidence. Criterion validity is verified by the practical effects at Mianyang Teachers’ College and its alignment with industry demands. Meanwhile, quality control measures, including questionnaire reliability and validity testing (Cronbach’s $\alpha = 0.86$), interview triangulation, and double-blind data coding, are adopted to reduce bias and ensure the scientific rigor of the results.

7.2 Research limitations

This study explores the interdisciplinary training model for auditing talents in the digital-intelligent era using expert interviews, questionnaire surveys, and case analysis. Although multiple empirical methods and quality control procedures were applied to ensure scientific rigor and reduce bias, the study still has certain limitations and potential biases due to constraints in research design, sample selection, and methodology.

First, the sample lacks sufficient representativeness. The teacher-student survey covered only 52 teachers and 198 students from 12 applied undergraduate universities, mainly located in southwestern and eastern China, without sufficient representation of universities in central and western regions or those with different disciplinary characteristics. Among the 22 interviewed experts, practitioners and academic scholars accounted for a high proportion, while experts from educational administrations and local audit associations were under-represented. In addition, the case study was limited to Mianyang Teachers’ College. As the training model is affected by regional economic conditions and institutional resources, the universality of the conclusions needs further verification.

Second, methodological limitations exist in both subjective and objective aspects. Subjectively, semi-structured interviews and online questionnaires are inherently prone to bias, which may arise from the design of outlines, survey implementation, and qualitative data coding, and cannot be completely eliminated even with quality control. Objectively, the study lacks objective quantitative indicators such as the proportion of interdisciplinary courses and skill assessment pass rates, relying mainly on descriptive statistics and qualitative analysis, which weakens the persuasiveness of the conclusions. Furthermore, as a cross-sectional study with a short time span, it cannot reflect dynamic developmental trends or provide long-term tracking of the training model.

To address these limitations, future research will expand the scope and types of samples, improve the methodological system, and extend the research dimensions to enhance the universality and objectivity of conclusions, and establish a comprehensive research framework for interdisciplinary talent training.

7.3 Future research directions

Based on the limitations of this study and the practical challenges in interdisciplinary training of auditing talents, future research can be expanded in five directions: First, conduct regionally differentiated studies according to regional disparities among eastern, central, and western China, and construct targeted interdisciplinary training models for auditing. Second, focus on the practical application of digital-intelligent technologies and develop teaching modules tailored to auditing positions to alleviate the imbalance between theoretical instruction and practical training. Third, establish a quantitative evaluation system for training effectiveness using objective data to realize accurate and long-term assessment. Fourth, explore university-industry collaborative mechanisms for interdisciplinary faculty development to alleviate the shortage of qualified teachers. Fifth, carry out inter-institutional collaborative training research to explore feasible pathways of course sharing, faculty exchange, and resource interoperability, so as to provide more comprehensive and transferable theoretical and practical references.

8 Conclusions and policy implications

8.1 Conclusion

In the digital era, digital technology revolution is promoting the continuous transformation of auditing functions. The traditional auditing discipline construction and undergraduate talent training models are no longer adapted to the needs of new economic forms and models, urgently requiring colleges and universities to innovate the auditing talent training system. Against the background of the digital-intelligent era, this study explores the problems existing in the cultivation of digital-intelligent auditing talents in application-oriented undergraduate institutions, such as insufficient interdisciplinary development and weak interdisciplinary faculty strength. In response to these problems, it proposes a series of reform measures, including constructing an interdisciplinary curriculum system, cultivating students' interdisciplinary thinking and abilities, optimizing the construction of practical teaching resources, promoting in-depth industry-university-research cooperation, and improving faculty quality. These measures help break disciplinary barriers, cultivate students' interdisciplinary thinking and abilities, enhance their ability to use digital-intelligent technologies and interdisciplinary knowledge to solve complex auditing problems, and strengthen their professional competitiveness and comprehensive quality.

Through surveys, interviews, and case analysis, this study clarifies the new talent demands of the auditing industry and the core dilemmas in the interdisciplinary training of applied undergraduate universities, constructs and verifies an adaptive training model. A multi-dimensional validity evaluation based on the characteristics of auditing research shows that the survey design of this study is closely aligned with the core research topics, the logic between theory and empiricism is consistent, the conclusions are highly consistent with industry and practical needs, and the reliability of data is guaranteed by multiple quality control measures. The research results have good scientificity and effectiveness, and can provide a reliable reference for the interdisciplinary training of auditing talents in applied undergraduate universities. Affected by the

limitations of sample selection and research methods, the interpretation and application of the results need to be objectively analyzed in combination with the regional and type characteristics of the universities.

Through in-depth interviews with industry-university-research experts and special surveys of teachers and students, this study clarifies the new talent demands of the auditing industry in the digital-intelligent era, identifies the core dilemmas in the interdisciplinary training of auditing talents in applied undergraduate universities, and verifies the feasibility of the constructed training model through the practice of Mianyang Teachers' College. The above research results are the core conclusions of this empirical study, which can intuitively reflect the mainstream status of current interdisciplinary training of auditing talents in applied undergraduate universities. However, it should be noted that the samples of this study are mainly from applied undergraduate universities in southwest and eastern China, and most of the survey data are based on the subjective cognition of the respondents. Affected by the limitations of sample selection and research methods, the results of this study only provide a reference framework for the interdisciplinary training reform of similar universities, and cannot be directly generalized to all regions and all types of applied undergraduate universities. When interpreting and applying the results of this study, each university needs to conduct objective analysis and personalized adjustment in combination with its own regional positioning, disciplinary characteristics and resource endowments.

8.2 Policy and practical implications

This study identifies the core dilemmas in the interdisciplinary training of auditing talents in applied undergraduate universities in the digital-intelligent era, and constructs and verifies a training model of "curriculum integration, industry-education collaboration, and faculty co-construction". The study results provide an operational path for the interdisciplinary education reform of auditing majors in applied undergraduate universities, and also provide a grass-roots empirical basis for local education authorities to formulate policies for the training of applied finance and economics talents, which has both practical value for audit education and reference significance for higher education management policies.

8.2.1 Policy implications

Based on the results and practical experience of this study as empirical evidence, combined with the needs of regional industrial development, formulate special guidelines for the digital and interdisciplinary transformation of finance and economics majors in applied undergraduate universities, clarify the training objectives and core competence requirements, and standardize and guide the reform practice of grass-roots universities; establish a special fund for the interdisciplinary training of applied finance and economics talents, focusing on supporting the construction of digital audit laboratories, the development of interdisciplinary courses and faculty training; give financial and policy inclinations to universities in less developed central and western regions to narrow the gap in regional audit education resources; incorporate the offering of interdisciplinary courses, the depth of industry-education integration, and the quality

of talent training into the university education quality evaluation indicators to guide universities to attach importance to interdisciplinary training; give play to the overall coordination role of the government, integrate the resources of regional universities, industries and associations, build a regional collaborative platform for digital finance and economics talent training, and promote the cross-university sharing of courses, faculty and practical resources.

8.2.2 Practical implications

Build a curriculum group centered on “core auditing professionalism + digital-intelligent technology support + industry scenario application,” increase the proportion of practical courses such as big data auditing and information system auditing, and break the disciplinary barriers between auditing, computer science and statistics; dynamically revise the curriculum syllabus in combination with industry needs, introduce real audit case teaching, and realize the connection between theoretical teaching and post practice; construct a faculty team through a three-dimensional model of “introduction, training and appointment,” introduce auditing professionals with interdisciplinary backgrounds, carry out special training on digital-intelligent audit technology for existing teachers and establish a long-term mechanism for enterprise secondment, and employ senior industry auditors as part-time teachers to make up for the shortage of interdisciplinary practical teaching resources; deepen cooperation with accounting firms and fintech enterprises, co-build a digital-intelligent audit industry-education integration education platform, and jointly develop training programs and simulated audit projects; increase investment in digital-intelligent audit training centers, equip professional equipment and desensitized databases of real enterprise audit data, and provide students with full-process practical scenarios.

Data availability statement

The data will be made available by the authors upon reasonable request.

Ethics statement

The studies involving humans were approved by Mianyang Teachers' College Ethics Review Committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

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XW: Writing – review & editing, Methodology, Software, Investigation, Writing – original draft, Conceptualization. JR: Validation, Writing – review & editing, Supervision, Writing – original draft. SL: Writing – original draft, Validation, Conceptualization, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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