

AI-Enabled Audit Talent Development under China's New Quality Productive Forces: Mechanisms and Practice Pathways in Higher Education

Qinhao Yang

School of Accounting, Chongqing Technology and Business University, Chongqing 400067, China

Abstract: In China, efforts to develop new quality productive forces have placed higher and more complex demands on the competencies of audit professionals. Yet university-based audit talent development still tends to have a narrow disciplinary focus, limited training in data- and AI-related skills, and underdeveloped practice environments, making it difficult to effectively meet these emerging requirements. In this context, higher audit education needs to respond to the drive to develop new quality productive forces and to reshape existing audit talent development systems. This paper constructs a three-dimensional mechanism framework of intelligent empowerment, cognitive empowerment, and ecological empowerment, and uses it to clarify the role of artificial intelligence (AI) in reconstructing audit knowledge and skill structures, optimizing learning processes and assessment approaches, and reshaping collaborative education ecosystems. On this basis, it proposes practice pathways for AI-enabled audit talent development in six areas: digital and intelligent curriculum development, strengthened teacher support systems, personalized capability-enhancement schemes, multi-dimensional learning outcome evaluation systems, immersive practice environments, and improved government–industry–university–research collaboration mechanisms. The study aims to provide a reference for universities seeking to advance audit education reform and to develop high-quality audit professionals aligned with the requirements of new quality productive forces.

Keywords: New Quality Productive Forces, Artificial Intelligence (AI), Audit Talent Development, Higher Education.

1. Introduction

In China, the notion of new quality productive forces has been put forward to describe an advanced form of productivity that departs from traditional growth models and is characterized by high technology, high efficiency and high quality. In this policy framework, new quality productive forces are understood as both innovation-driven and talent-driven: innovation depends on high-quality human capital, and the development of such human capital in turn relies on education. A virtuous interaction among education, science and technology, and talent is thus regarded as the fundamental foundation for the emergence and growth of new quality productive forces (Fan et al., 2024) [1]. As a strategic hub connecting these three elements, higher education is expected not only to undertake the core task of developing high-quality talent, but also to play an important role in advancing scientific and technological progress and serving national development strategies. Building talent development systems that are aligned with the requirements of new quality productive forces has therefore become an important task for universities.

Since the 18th National Congress of the Communist Party of China, increasing emphasis has been placed on the role of audit. Audit has been identified as a key component of the national supervision system and an important force for promoting the modernization of the governance system and governance capacity (Leixnering et al., 2025) [2]. It contributes to supervising policy implementation, regulating market behavior and supporting the efficient allocation of resources, thereby providing institutional safeguards for the healthy development of new quality productive forces. Within this context, audit professionals occupy a pivotal position: as members of audit institutions and as practitioners carrying out

specific engagements, their professional competence and overall quality directly influence the effectiveness of audit governance and oversight. Developing high-quality audit talent is therefore closely linked to the broader objective of fostering new quality productive forces. However, existing models of audit talent development in universities remain largely anchored in traditional fields such as accounting, finance and business administration, resulting in a relatively narrow training focus. Students' knowledge structures tend to be single-disciplinary, their technical capabilities-especially in digital and data-intensive environments-are often insufficient, and their critical thinking and innovative capacity are not systematically developed. As a result, it is difficult for current programs to meet the requirements that the development of new quality productive forces places on audit professionals in terms of knowledge systems, skill structures, modes of thinking and professional values. At the same time, efforts to reform audit talent development are constrained by several factors, including the complexity of integrating cross-disciplinary content, challenges in embedding practice scenarios into teaching, lagging faculty development in relevant domains and the limited effectiveness of existing collaborative education mechanisms.

The rapid development and wider application of artificial intelligence (AI) provides an important opportunity to rethink and reshape the paradigm of audit talent development. AI has strong capabilities in knowledge integration, personalized learning support, intelligent feedback and simulation of professional contexts, and shows considerable potential for improving teaching efficiency, stimulating student engagement, strengthening practice-oriented learning and promoting collaboration among multiple stakeholders (Aguado-García et al., 2025) [3]. This raises a series of questions: can AI play a substantive role in audit talent

development so as to respond more effectively to the practical demands arising from the development of new quality productive forces? Through what mechanisms might AI influence audit curricula, learning processes and collaborative education ecosystems? And how can the effectiveness of AI applications in this context be enhanced? Against this background, this paper systematically explores the mechanisms and practical pathways of AI-enabled audit talent development in the context of new quality productive forces, with a view to providing theoretical support and practical guidance for promoting better alignment between higher education and the development of new quality productive forces.

2. Literature Review

2.1. Demand for Audit Talent under New Quality Productive Forces

Within the broader agenda of developing new quality productive forces, technological innovation, high-quality human capital and supportive institutional arrangements are expected to work together to drive deep changes in production modes and value creation. Universities, as key sites of talent development and scientific innovation, are therefore under pressure to reshape their educational offerings so as to serve national strategies, industrial upgrading and the demand for new types of talent. In this context, the competency profile required of audit professionals is shifting from a single-skill training model to a more multi-dimensional competency profile (Fogarty and Campbell, 2024) [4]. First, literacy in data and digital technologies is becoming a basic requirement: auditors are increasingly expected to master skills such as automated information acquisition, big data analysis and AI-assisted judgment (Ballantine et al., 2024) [5]. Second, a cross-disciplinary knowledge base is emerging as a core underpinning, requiring auditors to integrate knowledge from accounting, auditing, finance, law, information technology and public administration in order to address complex problems in practice. Third, critical thinking and innovative capacity are becoming essential for coping with uncertainty and complexity, enabling auditors to question assumptions, analyze evidence rigorously and design appropriate responses in dynamic environments (Wolcott and Sargent, 2021) [6]. Fourth, social responsibility and public governance awareness are being incorporated more explicitly into professional ethics, as auditors are expected to uphold market order while also responding to broader concerns such as sustainable development, public interest and social equity.

Taken together, these trends suggest that universities need to develop audit talent with strong digital capabilities, cross-disciplinary knowledge structures, critical thinking skills and a clear sense of social responsibility. However, existing audit programs still show structural misalignments: limitations remain in curriculum content, pedagogical models and practice-oriented components, which makes it difficult to fully match the competency requirements implied by the development of new quality productive forces.

2.2. The Impact of AI on Talent Development in Higher Education

Artificial intelligence has emerged as an important technological driver of educational transformation and is reshaping the ideas, structures and practices of talent development in higher education (Chiu et al., 2023; Guo et al.,

2024) [7, 8]. On the one hand, through the analysis and modeling of learners' behavioral data, AI supports a shift from standardized, "one-size-fits-all" instruction toward more fine-grained, data-informed support based on learning analytics and student profiles, enabling more intelligent matching of teaching resources and the construction of personalized learning pathways. On the other hand, through technologies such as knowledge graph construction, intelligent analytics and decision support, AI facilitates the expansion of course content from single-discipline knowledge to cross-disciplinary knowledge networks and supports deeper integration of intelligent tools into teaching processes, which can help strengthen students' critical thinking and integrative analytical abilities (Zhang and Aslan, 2021) [9].

At the same time, AI is driving changes in teaching management and practice-oriented education. By drawing on real-time collection and analysis of teaching and learning data, it enables more digital and precise forms of teaching management and strengthens process monitoring and feedback. In addition, through virtual simulation, scenario-based training and task-driven learning, AI can help to deepen industry-education collaboration and foster more collaborative learning ecosystems, thereby enhancing students' practical skills (Bates, 2020) [10].

2.3. Summary of the Literature

Overall, existing studies have provided relatively systematic discussions of the competency requirements for audit professionals under the development of new quality productive forces, covering dimensions such as skill structures, knowledge bases, ways of thinking and professional ethics. The potential of AI to empower higher education has also been widely acknowledged. Existing studies highlight its role in reconstructing knowledge systems, enabling more intelligent teaching management and fostering more open practice ecosystems.

However, much of the current literature remains at a relatively macro level, focusing on general educational change or broad visions of AI-enabled education. There is still limited attention to how AI can be used in more concrete ways to support discipline-specific talent development in auditing, and how it can be translated into operational pathways for developing audit professionals who are aligned with the requirements of new quality productive forces. Against this backdrop, the present paper builds on the development logic of new quality productive forces and the enabling potential of AI in education, focuses on the practical challenges and transformation needs in audit talent development, and accordingly develops a mechanism-based framework for AI-enabled audit talent development and proposes corresponding practice pathways, with the aim of providing targeted theoretical and practical reference for universities seeking to reform their audit talent development.

3. Mechanisms of AI-enabled Audit Talent Development under New Quality Productive Forces

New quality productive forces emphasize the reconfiguration of production factors and efficiency gains driven by scientific and technological innovation. Their formation and evolution depend not only on the iterative upgrading of technological systems, but also on the systemic restructuring of talent development models. AI-enabled audit

talent development is therefore not a matter of simply inserting a single technological tool into existing programs. Rather, it operates through three mutually reinforcing dimensions—intelligent empowerment, cognitive empowerment and ecological empowerment—that reshape the knowledge structures of audit professionals, the pathways through which their competencies are formed, and the collaborative education environment, thereby providing hybrid and innovative audit talent to support the development of new quality productive forces.

In the dimension of intelligent empowerment, AI draws on technologies such as knowledge graphs, natural language processing and semantic analysis to break down discipline-based fragmentation in traditional curricula and to integrate heterogeneous knowledge from multiple sources. First, by constructing knowledge graphs that span auditing, accounting, finance, law, information technology and public administration, AI can present previously dispersed knowledge points as an interconnected network, guiding students from fragmented memorization toward more systematic understanding and thereby fostering cross-disciplinary knowledge structures consistent with the characteristics of new quality productive forces. Second, through intelligent retrieval and semantic matching, AI makes it possible to embed the latest auditing standards, regulatory requirements, audit tools and representative cases dynamically into teaching, shortening the transmission chain of knowledge updates and shifting audit education content from a “static textbook” model to a “dynamic knowledge base.” Third, by relying on intelligent analytics tools, repetitive tasks such as data cleaning, anomaly detection and simple matching can be delegated to AI, enabling students to devote more attention to higher-order judgment activities such as risk identification, audit strategy selection and the integrated evaluation of audit evidence; in turn, this helps to strengthen critical thinking and professional judgment in practice-oriented training. Fourth, by providing intelligent recommendations and support for reorganizing teaching content, AI can facilitate the continuous updating of faculty knowledge structures, enhance the overall digital and intelligent literacy of teaching teams and their capacity for curriculum innovation, and thus offer more stable intellectual and technological support for audit talent development.

In the dimension of cognitive empowerment, AI transforms teaching decisions that previously relied mainly on instructors’ experience into data-based diagnostic and personalized support processes through real-time collection and in-depth analysis of data on students’ learning behaviors. First, with the help of multimodal data collection, learning profiles and learning analytics, AI can combine process data from classroom interaction, online learning, assignments and tests to dynamically portray students’ learning rhythms and learning characteristics, thereby providing an empirical basis for differentiated teaching and individualized guidance and promoting a shift in audit courses from “uniform pace and uniform requirements” to “tiered progression and instruction in accordance with individual differences.” Second, through adaptive learning systems and intelligent push mechanisms, AI can automatically generate personalized exercise sets, case scenarios and learning resource packages in response to students’ real-time performance, forming a “diagnosis—feedback—remediation—reassessment” closed-loop learning process and helping students move from merely “knowing that” to “knowing why” and “knowing what ought to be.”

Third, AI supports a transformation in learning outcome evaluation from an exclusive emphasis on summative assessment toward a combination of diagnostic, formative and summative approaches: process data such as classroom participation, collaborative interaction and project performance can be incorporated into evaluation frameworks, overcoming the limitations of a single exam-centered metric and, through strengthened process feedback and guided reflection, encouraging students to build sustained self-directed learning capabilities and laying a foundation for lifelong learning in line with the pace of new quality productive forces.

In the dimension of ecological empowerment, AI relies on algorithmic models, process mining and virtual simulation technologies to reshape the collaborative education ecosystem for audit talent development. First, by intelligently integrating the resource elements of multiple actors—such as government departments, university units and industry organizations—AI can bring information on talent needs, practice project opportunities and course teaching resources together on unified digital platforms, enabling more precise matching between supply and demand, significantly reducing the cost of resource linkage and coordination, and improving the operational efficiency of government–industry–university–research collaboration in talent development. Second, with the help of intelligent de-identification of practice data and the automated construction of simulation scenarios, AI can embed typical audit processes, risk situations and professional roles into virtual projects and scenario-based tasks, efficiently building immersive and multimodal practice environments that closely reflect real-world practice. This allows students to complete risk assessment, procedure design, evidence collection and conclusion formulation in “quasi-real” contexts, thereby strengthening the practice orientation of training. Third, relying on process mining and online collaboration platforms, AI can conduct dynamic monitoring and analysis of key process stages, participant responsibilities and operational bottlenecks in collaborative education processes, making collaboration more visible. On this basis, universities can continuously optimize course co-development, project-based co-training and joint mentoring arrangements, facilitating a shift in government–university–enterprise cooperation from fragmented, project-based cooperation toward more regular and institutionalized collaboration, and gradually improving the overall effectiveness of collaborative audit talent development.

4. Practical Pathways for AI-enabled Audit Talent Development under New Quality Productive Forces

In light of the growing demand for high-quality audit professionals under the development of new quality productive forces, universities need to move beyond a purely conceptual embrace of AI and translate it into workable institutional arrangements and teaching practices. Around the key questions of “what to teach, how to learn and how to practice,” universities can start from curriculum and faculty development, personalized training and learning outcome evaluation, the building of immersive practice environments and the improvement of government–industry–university–research collaboration mechanisms, and thereby construct a set of mutually connected and jointly advancing practical

pathways for AI-enabled audit talent development.

4.1. Digital and Intelligent Curriculum Development

With the support of AI technologies, universities can gradually optimize and redesign audit curricula by using knowledge-graph construction and the integration of cross-disciplinary content as key levers. First, program directors and core faculty members can use knowledge-graph tools to map existing training schemes and core courses, and build an “audit knowledge graph” that covers content from auditing, accounting, finance, law and information technology. Second, using this knowledge graph as a reference, universities can revise and re-modularize core courses such as Auditing, Government Auditing and Internal Auditing, and systematically embed cross-disciplinary units on data analysis, compliance review and the use of intelligent audit tools. Third, in both classroom teaching and after-class study, universities can deploy visual knowledge-graph interfaces and intelligent search functions, guiding students to develop problem-solving capabilities oriented toward complex business scenarios through targeted knowledge learning, case analysis and small-scale project work, and thereby providing concrete curricular support for an audit talent development system that combines multi-disciplinary knowledge structures with digital and intelligent skills.

4.2. Strengthening Teacher Support Systems

By leveraging intelligent teaching and research platforms, knowledge graphs and AI-based teaching support tools, universities can systematically embed AI into faculty development and routine teaching and research activities. First, they can build an intelligent teaching and research platform that integrates up-to-date auditing standards, industry practice cases and applications of data- and AI-driven audit tools. Through intelligent analytics and recommendation functions, the platform can push resources tailored to specific courses and instructors, helping faculty regularly revise syllabi, update teaching content and develop locally relevant cases. Second, AI tools can be incorporated into key teaching tasks such as lesson preparation, assignment design and classroom feedback analysis. Applications such as lesson-planning assistants, intelligent assignment analytics and classroom data dashboards can reduce instructors’ repetitive workload in information search, grading and statistics, allowing them to devote more energy to instructional design and student capability development. Third, taking the intelligent teaching and research platform as a focal point, universities can build teaching and research communities that support course development, resource sharing and teaching feedback, and introduce corresponding training and incentive measures to continuously enhance the overall digital literacy and curricular innovation capacity of teaching teams, thus providing strong faculty support for high-quality audit talent development.

4.3. Deepening Personalized Capability-Enhancement Schemes

Drawing on behavioral analytics and multimodal data collection, universities can embed AI throughout the full process of student development. First, using data accumulated on learning platforms and combining it with classroom records and periodic assessments, universities can establish student capability development profiles and classify students

along dimensions such as knowledge mastery, learning resilience, and collaborative participation. Teaching and research teams can regularly review these profiles to clarify development priorities and support strategies for different student groups. Second, around core audit competencies, capability modules such as data analysis, risk identification, and communication and writing can be defined. Based on students’ less-developed areas of competence, the system can automatically recommend corresponding learning task packages. Instructors and students can jointly agree on stage-based goals and assessment requirements, forming trackable learning contracts that encourage sustained engagement under clear goals. Third, personalized capability-enhancement schemes can be embedded into day-to-day teaching by integrating group discussions, course projects, discipline-based competitions, and graduation theses into coherent capability-development pathways. The system can periodically generate concise learning progress reports and reminders, while instructors focus on face-to-face guidance and reflective coaching. In this way, students are encouraged to improve their capabilities through ongoing practice and self-adjustment rather than short-term cramming aimed solely at examinations.

4.4. Building Multi-dimensional Learning Outcome Evaluation Systems

With the help of learning analytics and intelligent evaluation tools, universities can systematically redesign student evaluation systems. First, course assessment schemes can be revised to shift learning outcome evaluation from a model dominated by final written examinations toward a combination of diagnostic, formative and summative assessments. Process-based indicators can be incorporated into grade composition at defined proportions, strengthening the overall assessment of students’ analytical skills, capacity for teamwork, and professional ethics. Second, by relying on learning platforms, universities can establish unified mechanisms for collecting and presenting process data. AI can conduct real-time analysis and visualization of learning behavior data, providing instructors with class-level and individual learning reports and supporting evidence-based adjustments to teaching priorities, pacing and tiered instruction strategies. Third, evaluation results should be fed back to students in a timely manner through learning reports, early-warning messages and one-to-one guidance, helping them understand their strengths and areas for improvement, and encouraging them to “learn for development” rather than merely “learn for exams.” Over time, this can foster self-directed and lifelong learning capabilities that are better aligned with the requirements of new quality productive forces.

4.5. Developing Immersive Practice Environments

Using virtual simulation technologies, intelligent audit tools and real-world audit cases, universities can systematically build high-fidelity teaching environments that closely reflect industry practice. First, in collaboration with audit institutions, accounting firms and public or private entities, universities can select representative audit projects and, with AI assistance, conduct data de-identification and scenario abstraction to construct reusable libraries of typical audit processes and risk scenarios. Second, virtual simulation platforms can be used to embed elements such as business

processes, risk distributions and role allocations into scenario-based project tasks, and to design practice projects that cover key steps including material misstatement risk assessment, audit procedure design, audit evidence collection and the formulation of audit conclusions. Students can be guided to complete entire audit tasks in quasi-real contexts through group collaboration. Third, virtual simulation training can be closely linked with classroom teaching, course papers and practice reports, with assessment placing particular emphasis on process documentation and reflective summaries. This can help students systematically improve their problem-analysis skills, their ability to handle complex audit situations and their professional judgment through repeated practice, thereby achieving deeper integration between classroom teaching and professional practice.

4.6. Improving Government–Industry–University–Research Collaboration Mechanisms

Relying on algorithmic models, information-sharing tools and online collaboration platforms, universities can build regular and institutionalized mechanisms for collaborative education. First, they can take the lead in establishing shared audit project, case and internship position databases for multiple actors, including government departments, enterprises and public institutions, accounting firms and research organizations. By clearly specifying project types, competency requirements and learning objectives, these databases can support more effective alignment between practice projects and talent development goals. Second, all stages of collaborative education can be managed via online platforms. Process mining and related techniques can be used to analyze key stages and operational bottlenecks in course co-development, project-based co-training, and joint mentoring arrangements. The resulting insights can help optimize collaboration processes, clarify roles and responsibilities, and improve feedback mechanisms, thereby supporting a shift in government–university–enterprise collaboration from fragmented, project-based cooperation toward more regular and institutionalized collaboration. Third, universities can establish evaluation and feedback mechanisms for collaborative education that incorporate indicators such as students' practice performance, employer evaluations and project quality. Data analytics tools can be used to generate regular evaluation reports, which in turn can inform adjustments to cooperation content, improvements to training schemes and the refinement of collaboration mechanisms. By improving collaborative education systems that feature multi-party participation, process transparency and assessable outcomes, universities can continuously enhance the practice orientation of audit talent development and its capacity to serve the development of new quality productive forces.

5. Conclusion

Efforts to develop new quality productive forces have placed higher and more complex demands on the competencies of audit professionals. However, university-based audit talent development still tends to have a narrow disciplinary focus, limited training in data- and AI-related skills, and underdeveloped practice environments, and existing systems also show shortcomings in cross-disciplinary integration and collaborative education

mechanisms. Grounded in the development logic of new quality productive forces and focusing on how AI can enable audit talent development, this paper has constructed a three-dimensional framework of intelligent empowerment, cognitive empowerment, and ecological empowerment, and clarified the role of AI in reconstructing audit knowledge and skill structures, optimizing learning processes and assessment approaches, and reshaping collaborative education ecosystems. On this basis, the paper has proposed practice pathways for AI-enabled audit talent development in six areas—digital and intelligent curriculum development, strengthened teacher support systems, personalized capability-enhancement schemes, multi-dimensional learning outcome evaluation systems, immersive practice environments, and improved government–industry–university–research collaboration mechanisms—with the aim of providing a reference for universities seeking to advance audit education reform and to develop high-quality audit professionals aligned with the requirements of new quality productive forces. At the same time, AI-enabled audit talent development is not only a technological issue but also an educational and governance challenge, and its further advancement will continue to depend on sustained efforts by universities in institutional strategy and policy design, resource provision, and faculty development.

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