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Reconstructing Auditing Education in the Age of Artificial Intelligence: Developing Auditor Competencies for Human–AI Collaborative Environments

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Abstract

The increasing use of artificial intelligence (AI) in audit practice is changing the nature of audit work and raising new questions about how universities should prepare future auditors. Recent developments in generative AI, machine learning, and data analytics have enabled audit firms to automate a growing range of activities, including data extraction, document analysis, and risk identification. However, these technological developments do not simply replace existing audit procedures; they also alter the knowledge, skills, and professional capabilities required of auditors. This study examines how AI-driven changes in audit practice influence undergraduate auditing education. Although previous discussions have highlighted the importance of digital skills in accounting education, less attention has been paid to how AI reshapes the broader competency framework of future auditors. In particular, the challenge is not merely whether students can use technological tools, but whether they can integrate technology with audit evidence evaluation, professional judgment, and ethical decision-making.

Keywords

Artificial Intelligence; Auditing Education; Auditor Competency; Audit Analytics; Human–AI Collaboration; Accounting Education Reform.

1. Introduction

Artificial intelligence (AI) has become increasingly embedded in professional service activities, creating new possibilities and challenges for occupations that have traditionally relied on specialized knowledge and professional judgment. The auditing profession represents a particularly important context in which to examine these changes. Audit work has historically depended on auditors' ability to collect evidence, assess risks, evaluate internal controls, and form independent opinions. However, advances in artificial intelligence, particularly generative AI and machine learning technologies, are reshaping how auditors perform these tasks.

In contemporary audit practice, AI-based systems can assist auditors in processing large volumes of financial and non-financial information, identifying unusual transactions, reviewing contractual documents, and generating preliminary risk assessments. These applications have the potential to improve audit efficiency and expand analytical capabilities. Nevertheless, the increasing involvement of intelligent systems does not eliminate the need for human auditors. Instead, it changes the nature of auditors' contributions. As routine analytical activities become increasingly automated, auditors are expected to devote greater attention to interpreting information, evaluating the reliability of technological outputs, exercising professional judgment, and addressing ethical considerations.

These changes have important implications for auditing education. Universities have traditionally prepared auditing students through curricula emphasizing accounting knowledge, auditing standards, internal control evaluation, and audit procedures. This educational model

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has provided students with the technical foundation required for professional practice. However, the assumptions underlying this model are being challenged by the emergence of intelligent audit environments. Future auditors will need to combine traditional audit expertise with new capabilities related to data analysis, digital technologies, and human–AI interaction.

The challenge facing auditing education is therefore more fundamental than simply introducing additional technology courses. The key issue is how educational systems should redefine auditor competencies when technology becomes increasingly involved in audit processes. A student who can operate a data analytics tool but cannot understand the audit implications of analytical results may not be prepared for future professional practice. Similarly, an auditor who relies excessively on AI-generated recommendations without maintaining professional skepticism may create new risks for audit quality. Therefore, AI-era auditing education requires a careful balance between technological capability and the professional values that distinguish auditing from other analytical activities.

Existing research on accounting and auditing education has provided valuable insights into curriculum development, technology integration, and professional skill formation. However, several limitations remain. First, much of the existing literature focuses on the adoption of specific technologies, such as audit analytics tools or accounting information systems, rather than examining how AI changes the underlying competency structure of auditors. Second, prior studies often discuss digital skills as an additional capability rather than considering how technology interacts with traditional auditing competencies, such as professional judgment and skepticism. Third, limited attention has been given to the potential risks associated with AI adoption, including overreliance on algorithmic recommendations, data privacy concerns, and challenges related to algorithm transparency.

These limitations suggest the need for a broader perspective on auditing education reform. Rather than viewing AI as merely a technological innovation that universities should incorporate into existing curricula, this study considers AI as a factor that may reshape the professional identity and competency requirements of future auditors. Such a perspective is particularly relevant because auditing is not only a technical process but also a professional activity grounded in judgment, independence, and public trust.

Accordingly, this study addresses three research questions:

RQ1: How does artificial intelligence reshape the competency requirements of undergraduate auditing professionals?

RQ2: What challenges do existing auditing education systems face in preparing students for AI-enabled audit environments?

RQ3: How can universities redesign auditing education to develop auditors capable of effective human–AI collaboration?

To address these questions, this study develops a competency-oriented framework for auditing education in the AI era. Drawing on competency-based education theory and human–AI collaboration perspectives, the framework identifies three essential capabilities for future auditors: digital analytical capability, human–AI collaborative judgment capability, and technology-related ethical awareness. Based on this framework, the study proposes corresponding educational reforms involving curriculum redesign, teaching innovation, practical learning environments, faculty development, and assessment transformation.

This study makes several contributions. First, it extends the accounting education literature by shifting the discussion of digital transformation from technology adoption toward competency reconstruction. Rather than asking whether auditing students should learn AI-related technologies, this study examines what types of capabilities auditors need when intelligent systems become part of professional practice. Second, the study contributes to discussions of auditor competence by integrating technological capability with traditional auditing values,

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highlighting that AI literacy should complement rather than replace professional judgment and ethical responsibility. Third, the proposed framework provides practical guidance for universities and professional organizations seeking to redesign auditing education in response to technological change.

The remainder of this paper is organized as follows. Section 2 reviews relevant literature and develops the theoretical foundation of the study. Section 3 proposes an AI-era auditor competency framework. Section 4 discusses the challenges facing undergraduate auditing education. Section 5 presents a competency-oriented reform framework and implementation pathways. Section 6 discusses theoretical and practical implications, and Section 7 concludes the study.

2. Theoretical Foundation

2.1. Technological Change and the Evolution of Auditor Competencies

The relationship between technological development and auditor competence has attracted increasing attention in accounting and auditing research. Historically, technological innovation has influenced auditing by changing how auditors collect, process, and evaluate information. The adoption of computerized accounting systems, enterprise resource planning (ERP) systems, and computer-assisted audit techniques (CAATs) has gradually reduced auditors' reliance on manual procedures and increased the importance of analytical capabilities.

Recent developments in big data analytics and artificial intelligence represent a further stage of this transformation. Unlike previous technologies that mainly improved the efficiency of existing audit procedures, AI systems increasingly participate in activities involving information processing and preliminary decision support. For example, intelligent systems can identify abnormal transaction patterns, analyze large volumes of documents, and generate preliminary assessments of potential risks.

This development raises a fundamental question regarding auditor competence. If technological systems can perform many routine analytical tasks, what capabilities distinguish human auditors from automated systems? Existing auditing literature suggests that professional judgment, skepticism, contextual understanding, and ethical responsibility remain central elements of audit quality. Therefore, technological development should not be interpreted as reducing the importance of human expertise. Instead, it changes the nature of expertise required in auditing practice.

Previous studies on audit analytics have emphasized the importance of data-related skills among accounting professionals. However, possessing technical skills alone does not ensure effective audit performance. The value of analytical tools depends on auditors' ability to determine appropriate audit objectives, interpret analytical results, evaluate evidence reliability, and make justified professional judgments.

Therefore, AI-driven transformation requires a broader understanding of auditor competence. Future auditors need not only technological literacy but also the ability to integrate technological information with traditional auditing knowledge and professional values.

2.2. Digital Transformation and Accounting Education Reform

Accounting education has continuously evolved in response to changes in professional practice. Previous reforms have addressed issues such as strengthening analytical skills, improving communication ability, enhancing ethical awareness, and increasing practical experience. The emergence of digital technologies has further accelerated discussions regarding curriculum transformation.

Existing research has provided important insights into the integration of information technology and accounting education. Studies have examined the role of data analytics

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education, accounting information systems, and technology-enhanced learning environments in preparing accounting graduates for changing workplace requirements. These studies demonstrate that technological capability has become an increasingly important component of accounting competence.

Nevertheless, current approaches to digital transformation in accounting education face several limitations.

First, technology is often treated as an additional component rather than an integrated element of professional competence. Universities may introduce courses related to programming, databases, or analytics, but these courses are frequently separated from accounting and auditing contexts. As a result, students may acquire operational skills without understanding how these skills influence professional decisions.

Second, digital transformation discussions often emphasize efficiency and automation while paying insufficient attention to professional judgment. Auditing differs from many other technology-intensive professions because audit conclusions require evaluation of evidence, consideration of business circumstances, and professional skepticism. A technologically capable auditor who lacks judgment capability may not necessarily improve audit quality.

Third, limited research has examined how AI changes the educational objectives of auditing programs. The question is no longer simply whether students should learn digital tools, but what types of capabilities should define a competent auditor when intelligent systems become embedded in audit processes. This study addresses these limitations by conceptualizing AI-driven auditing education reform as a process of competency reconstruction rather than technology adoption.

2.3. Theoretical Foundation

2.3.1. Competency-Based Education Perspective

This study draws first on competency-based education theory, which emphasizes that professional education should focus on developing integrated capabilities required for effective performance rather than merely transmitting disciplinary knowledge.

Within professional education, competence generally involves the combination of knowledge, technical skills, cognitive abilities, professional attitudes, and ethical values. This perspective is particularly relevant to auditing because audit performance depends not only on understanding standards and procedures but also on applying professional judgment in complex and uncertain environments.

From this perspective, AI does not eliminate traditional auditing competencies. Instead, it expands the boundaries of professional competence.

For example, knowledge of auditing standards remains necessary, but auditors increasingly need to understand how AI-generated analyses relate to audit evidence. Data analytics skills become meaningful only when auditors can connect analytical findings with audit objectives and risk assessments. Similarly, familiarity with AI tools must be accompanied by professional skepticism to evaluate whether technological outputs are appropriate.

Therefore, AI-era auditing education should move beyond knowledge accumulation and focus on developing integrated professional capabilities.

2.3.2. Human–AI Collaboration Perspective

The second theoretical foundation is derived from research on human–AI collaboration.

A common assumption in discussions of technological disruption is that intelligent systems will replace human professionals. However, evidence from professional service contexts suggests that AI often changes task allocation rather than completely eliminating human roles.

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In auditing, AI systems are particularly effective at processing large-scale information and identifying potential patterns or anomalies. However, audit decisions require contextual interpretation, ethical consideration, and accountability, which remain dependent on human professionals.

This perspective suggests that future auditors should not be trained as competitors of intelligent systems but as effective collaborators with them.

Human–AI collaboration requires auditors to develop several capabilities: understanding the strengths and limitations of AI systems;designing appropriate analytical tasks;evaluating algorithm-generated information;integrating technological outputs into professional judgments.Therefore, auditing education must prepare students not merely to use AI but to manage professional interactions with AI systems.

2.3.3. Professional Judgment and Ethical Responsibility Perspective

A third theoretical consideration relates to the distinctive nature of auditing as a profession.Unlike purely technical occupations, auditing serves an assurance function based on public trust. Audit professionals are expected to maintain independence, objectivity, and professional skepticism.

The introduction of AI creates new challenges for these professional values. Algorithmic systems may produce biased outputs, rely on incomplete data, or operate through processes that are difficult to interpret. If auditors accept technological recommendations without sufficient evaluation, the quality and credibility of audit judgments may be compromised.

Therefore, AI-era auditor competence must include not only digital capability but also ethical awareness and responsibility.This perspective highlights an important argument of this study:The future auditor is not a technology operator, but a professional who can responsibly integrate technology into audit decision-making.

3. AI-era Auditor Competency Framework

Based on the above theoretical discussion, this study proposes an AI-era auditor competency framework. The framework argues that future auditing professionals require three interconnected capabilities:Digital analytical capability;Human–AI collaborative judgment capability;Technology-related ethical and governance awareness.

These competencies represent an extension of traditional auditor competence models by incorporating technological transformation while maintaining the professional foundations of auditing.

3.1. Digital Analytical Capability

Digital analytical capability refers to auditors' ability to understand, process, and interpret digital information using analytical technologies. Traditional auditing primarily relied on structured financial information and sampling-based procedures. However, AI-enabled auditing increasingly involves diverse information sources, including transaction databases, operational records, contracts, and other unstructured data. Future auditors therefore need sufficient understanding of: data structures; analytical methods; visualization techniques; AI-assisted audit procedures. However, digital analytical capability should not be interpreted as transforming auditors into data scientists. The objective is not to replace auditing expertise with technical expertise but to enable auditors to apply analytical technologies in support of audit objectives. For example, an AI model may identify unusual revenue patterns. Determining whether these patterns indicate control deficiencies, accounting errors, or legitimate business changes requires auditors' understanding of business processes and professional judgment. Therefore, digital capability should be embedded within auditing practice rather than developed independently.

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3.2. Human–AI Collaborative Judgment Capability

Human–AI collaborative judgment capability represents auditors' ability to combine technological outputs with professional reasoning. As AI systems become increasingly involved in audit analysis, auditors will encounter situations where algorithm-generated recommendations influence audit decisions. In such environments, professional judgment becomes even more important. This capability includes three elements. First, auditors need the ability to critically evaluate AI outputs. AI-generated results should be treated as evidence requiring assessment rather than unquestioned conclusions. Second, auditors need to understand the limitations of algorithms. AI systems may identify statistical relationships but may fail to understand organizational context or emerging risks. Third, auditors need to integrate technological information with professional knowledge. Effective audit decisions require understanding not only what the data shows but also why particular patterns occur.Thus, human–AI collaboration represents an enhancement rather than a reduction of auditor judgment.

3.3. Technology-Related Ethical and Governance Awareness

Technology-related ethical awareness reflects auditors' ability to recognize and address ethical risks associated with AI applications.AI adoption in auditing introduces several governance concerns: algorithmic bias; data confidentiality; information security; lack of explain ability; responsibility attribution. Because auditors operate in environments involving sensitive financial information, improper use of AI technologies may create significant professional risks. Future auditing professionals therefore need to understand not only how AI works but also when and under what conditions AI applications are appropriate. Maintaining professional skepticism toward technological outputs should become an essential component of auditor education.

4. Challenges Facing Undergraduate Auditing Education in the AI Era

Although universities have increasingly recognized the importance of digital transformation, undergraduate auditing education remains largely influenced by traditional assumptions about audit work and professional competence. The challenge is not simply that existing programs lack technology-related courses. Rather, the deeper issue lies in the mismatch between current educational systems and the changing nature of auditing practice.

As AI becomes increasingly integrated into audit processes, universities need to reconsider what knowledge, skills, and professional attributes should be developed among future auditors. This section identifies four major challenges that constrain the ability of current auditing education systems to respond effectively to AI-driven professional transformation.

4.1. Curriculum Fragmentation and the Weak Integration of Auditing and Digital Technologies

The first challenge concerns the fragmented integration between auditing knowledge and digital technologies. Traditional auditing curricula have been developed around the professional requirements of financial reporting assurance. Core courses typically emphasize auditing standards, audit procedures, internal control evaluation, and financial statement analysis. These components remain fundamental because they provide the conceptual basis for audit practice.

However, AI-enabled auditing environments require auditors to work with increasingly complex information systems and diverse data sources. Audit professionals are expected to understand how analytical technologies influence risk assessment, evidence evaluation, and audit decision-making.

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Many universities have responded by introducing individual technology-oriented courses, such as programming, database management, or data analytics. While these initiatives represent progress, they often remain separated from auditing education. Students may learn technical operations without understanding their relationship with audit objectives and professional responsibilities.

For example, learning how to apply machine learning models does not automatically enable students to determine whether algorithm-generated risk indicators provide sufficient audit evidence. Similarly, the ability to process large datasets does not guarantee that students can identify economically meaningful risks.

Therefore, the central curriculum challenge is not the absence of technological content but the lack of meaningful integration between technology and auditing logic. A future-oriented auditing curriculum should answer a more fundamental question: How can digital technologies enhance auditors' ability to perform professional judgments rather than simply automate audit procedures?

4.2. Traditional Teaching Approaches and the Limited Development of Professional Judgment

The second challenge relates to existing teaching approaches. Auditing education has traditionally relied on lectures, textbook-based learning, and structured case exercises. These approaches are effective for introducing auditing concepts and professional standards. However, they may provide insufficient opportunities for students to develop judgment capabilities in uncertain and technology-enabled environments.

This limitation becomes increasingly important because AI systems can perform many routine analytical activities. As automation expands, the comparative advantage of human auditors will increasingly depend on their ability to interpret information, evaluate evidence quality, and make decisions when clear answers are unavailable.

However, many students are accustomed to seeking predetermined solutions. They may focus on identifying the correct auditing procedure rather than understanding why a particular procedure is appropriate under specific circumstances.

The widespread availability of generative AI may further intensify this issue. Students can easily obtain explanations, summaries, and analytical suggestions from AI systems. While this improves learning efficiency, it may also encourage passive acceptance of AI-generated information. Therefore, auditing education must place greater emphasis on critical evaluation and professional skepticism.

Students should learn not only: "What conclusion does AI provide?" but also: "Why should this conclusion be accepted or questioned?" Developing such capabilities requires teaching models that emphasize inquiry, discussion, and evidence-based reasoning.

4.3. Limited Exposure to Intelligent Audit Practice Environments

The third challenge concerns the gap between classroom learning and contemporary audit practice. Audit firms increasingly use digital tools to support audit planning, data analysis, and risk assessment. However, many university training environments continue to rely on traditional simulation cases based primarily on financial statements and manual audit procedures.

This creates several problems. First, students have limited experience dealing with large-scale and heterogeneous data sources. Modern audit work involves not only financial records but also operational information, contracts, transaction histories, and other digital evidence.

Second, students may fail to understand how technologies are embedded within actual audit workflows. In professional practice, data analytics is not an isolated activity; it is connected with audit planning, testing procedures, evidence evaluation, and reporting.

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Third, universities face difficulties in providing realistic audit datasets because enterprise data often involves confidentiality concerns.

Consequently, effective auditing education requires new forms of cooperation between universities and professional organizations. Rather than simply providing internships, industry partners can contribute anonymized datasets, practical cases, and technology-enabled audit scenarios. Such cooperation can help bridge the gap between academic training and professional expectations.

4.4. Faculty Capability Constraints in Interdisciplinary Auditing Education

The fourth challenge involves faculty development. Auditing education reform ultimately depends on instructors who can integrate technological knowledge with auditing expertise. However, many auditing educators were trained primarily in accounting, auditing standards, and financial reporting. Although these foundations remain essential, they may not be sufficient for teaching in AI-enabled environments.

At the same time, simply introducing instructors with technical backgrounds cannot fully address this challenge. Effective auditing education requires contextual understanding of audit objectives, professional standards, and assurance responsibilities.

Therefore, the key issue is not replacing accounting educators with technology specialists, but developing interdisciplinary teaching capabilities. Faculty members need sufficient understanding of: how AI technologies operate; how digital evidence differs from traditional evidence; how analytical results influence audit judgments; what ethical risks arise from AI applications. This requires universities to establish long-term faculty development mechanisms rather than relying on short-term technical training.

5. Competency-Oriented Reform Framework for Auditing Education

Based on the competency framework developed earlier, this study proposes a competency-oriented reform framework for undergraduate auditing education.

The framework does not view AI transformation as a process of adding technology content to existing curricula. Instead, it considers reform as a systematic reconstruction involving educational objectives, curriculum design, teaching processes, practical environments, and evaluation mechanisms.

The proposed framework consists of five interconnected dimensions: competency-based curriculum redesign; human–AI collaborative learning transformation; intelligent audit practice development; interdisciplinary faculty development; competency-oriented assessment reform.

5.1. Redesigning Curriculum Around AI-Era Auditor Competencies

Curriculum reform should begin with a reconsideration of educational objectives. The purpose of auditing education should not be limited to producing graduates who understand auditing standards and procedures. Instead, universities should cultivate professionals capable of combining audit expertise with digital capabilities. A competency-oriented curriculum should contain three integrated layers.

First, auditing foundation. Students should continue to develop strong knowledge of: auditing theory; accounting principles; internal control; assurance standards; professional ethics. These areas represent the professional foundation of auditing.

Second, digital analytical capability. Students should develop practical understanding of: audit data analytics; database concepts; artificial intelligence applications; digital evidence analysis. However, these courses should be designed around audit problems rather than technical skills

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alone. For example, students should learn how analytical methods can support revenue risk assessment, inventory testing, fraud detection, and internal control evaluation.

Third, professional responsibility in technology environments. Students should understand: algorithm limitations; data governance; confidentiality risks; responsible AI use. Through this integrated structure, technology becomes embedded within auditing education rather than existing as a separate discipline.

5.2. Transforming Teaching Approaches Toward Human–AI Collaboration

AI availability requires a transformation of classroom learning models. Traditional teaching emphasizes knowledge transmission. However, when AI systems can provide instant explanations and information retrieval, the educational value of instructors increasingly lies in guiding students to analyze problems and develop professional reasoning. A human–AI collaborative learning model should emphasize three changes.

First, case-based learning should incorporate AI-supported audit scenarios. Students can use AI tools to analyze transaction data, identify potential risks, and evaluate the reliability of generated results.

Second, project-based learning should simulate complete audit processes. Students should experience the relationship between: data collection → risk assessment → audit testing → evidence evaluation → audit conclusion.

Third, assessment should evaluate reasoning processes rather than only final answers. Students should demonstrate: why they selected specific analytical approaches; how they evaluated AI outputs; how they formed professional conclusions. This approach encourages students to treat AI as an analytical assistant rather than an unquestioned authority.

5.3. Building Intelligent Audit Practice Environments

Practical experience is essential for developing AI-era auditing competence. Universities should move beyond traditional audit simulation software and develop intelligent audit practice environments. Such environments should include: realistic audit datasets; AI-assisted analytical tools; digital working paper systems; simulated audit decision scenarios. The objective is not to reproduce commercial audit systems completely, but to allow students to understand how technology influences audit processes. Industry cooperation is particularly important. Accounting firms can provide practical knowledge and anonymized cases, while universities can ensure educational relevance. This partnership can create a more effective bridge between academic learning and professional practice.

5.4. Developing Interdisciplinary Faculty Capabilities

Faculty development represents a critical condition for successful reform. Universities should encourage auditing educators to develop digital capabilities through: technology training; interdisciplinary research; cooperation with audit firms; participation in digital audit projects. However, the goal is not to transform auditing professors into programmers. Rather, educators should develop the ability to explain: how technologies support audit objectives; how analytical outputs affect audit judgments; what limitations and risks exist. Interdisciplinary teaching teams combining auditing specialists and technology experts may provide a more sustainable solution.

5.5. Reforming Assessment Systems Based on Professional Competencies

Assessment reform should correspond with competency-oriented educational objectives. Traditional auditing examinations mainly evaluate knowledge of standards and procedures. While necessary, such assessments may not capture students' ability to work effectively in AI-enabled audit environments. Future assessment systems should incorporate: analytical projects; AI-supported audit cases; professional judgment tasks; ethical decision scenarios.

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Students should be evaluated based on their ability to integrate technology with auditing reasoning. The objective is not to determine whether students can operate AI systems, but whether they can use AI responsibly to improve audit quality.

6. Discussion and Theoretical Implications

6.1. From Technology Adoption to Auditor Competency Reconstruction

Prior research on digital transformation in accounting education has primarily focused on whether universities should incorporate emerging technologies into curricula. Although this perspective highlights the importance of technological literacy, it may underestimate the deeper changes caused by artificial intelligence. This study argues that AI represents more than a new instructional tool or technical skill. It changes the nature of auditing work and, consequently, the competency structure required of future auditors. As intelligent systems increasingly perform routine analytical activities, the professional value of auditors increasingly depends on capabilities that cannot be fully automated, including contextual interpretation, professional judgment, skepticism, and ethical reasoning. Therefore, the central educational question is not simply whether auditing students should learn AI-related technologies. Instead, the more fundamental question is: What constitutes auditor competence when intelligent systems become embedded in audit processes? By addressing this question, this study extends previous accounting education research from a technology adoption perspective toward a competency reconstruction perspective. This theoretical shift is important because it recognizes that educational transformation involves changes not only in course content but also in the underlying conception of professional expertise.

6.2. Reconsidering the Relationship Between Technology and Professional Judgment

A second theoretical implication concerns the relationship between technological capability and professional judgment. Previous discussions of AI adoption in auditing have frequently emphasized efficiency improvements, expanded analytical capacity, and automation benefits. However, auditing differs from purely technical activities because audit quality depends fundamentally on human judgment. AI systems can identify patterns, classify information, and generate analytical suggestions, but they cannot independently determine whether evidence is sufficient, appropriate, and meaningful within a specific business context.

This study therefore proposes that AI should be viewed as a complement to professional judgment rather than a substitute for it. The implication for auditing education is significant. Digital competence should not be developed separately from professional reasoning. Instead, technological knowledge should be integrated with traditional auditing values, including: professional skepticism; independence; objectivity; ethical responsibility. Such integration provides a more balanced understanding of AI transformation in professional education.

6.3. Extending Human–AI Collaboration Research to Auditing Education

A third contribution of this study is extending human–AI collaboration perspectives into accounting and auditing education. Much existing AI research examines how technologies affect organizational processes and employment structures. Less attention has been given to how professional education should prepare individuals to work alongside intelligent systems. This study suggests that future auditors will operate within human–AI collaborative environments. Therefore, education should focus on developing students' ability to manage interactions with AI systems. Such capability includes: identifying appropriate tasks for AI applications; evaluating the reliability of algorithmic outputs; recognizing technological limitations; integrating AI-generated information into professional decisions. This perspective contributes

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to a broader understanding of professional education in the digital era by emphasizing that human expertise remains essential even when technological capabilities expand.

6.4. Implications for Future Research

This conceptual framework also provides several opportunities for future empirical research. First, future studies could examine whether AI-integrated auditing courses improve students' professional competencies compared with traditional teaching approaches. Second, researchers could investigate how accounting firms evaluate the digital capabilities of newly recruited auditors and whether university education adequately prepares graduates for these expectations. Third, future research could explore differences across universities. Institutions with different levels of technological resources, faculty expertise, and industry connections may experience different challenges in implementing AI-oriented auditing education reform. Finally, empirical studies could examine how AI affects specific dimensions of audit competence, such as professional skepticism, judgment quality, and evidence evaluation.

7. Practical Implications

7.1. Implications for Universities

The findings of this study suggest that universities should reconsider the objectives of auditing education in response to AI-driven changes in professional practice.

First, curriculum reform should move beyond adding isolated technology courses. Universities need to integrate digital capabilities with auditing knowledge so that students understand how technologies influence audit procedures, evidence evaluation, and professional judgment.

Second, teaching approaches should emphasize analytical thinking rather than information acquisition. Because AI systems can provide rapid access to information, the educational value of universities increasingly lies in developing students' ability to evaluate information critically.

Third, universities should establish flexible curriculum mechanisms. Since AI technologies evolve rapidly, auditing programs need continuous adjustment rather than fixed course structures.

7.2. Implications for Accounting Firms and Professional Organizations

Accounting firms play an important role in shaping auditing education because they directly experience changes in professional practice. Firms can contribute to educational reform by providing: practical audit cases; anonymized datasets; intelligent audit scenarios; professional mentoring. Such cooperation can help universities ensure that educational content reflects actual industry requirements. Professional organizations should also reconsider competency frameworks for future auditors. Existing professional requirements may need to incorporate digital literacy, data analysis capability, and AI governance awareness.

7.3. Implications for Auditing Educators

For auditing educators, AI transformation requires a reconsideration of teaching roles. Instructors should gradually move from being primarily knowledge transmitters toward facilitators of professional learning. Their role is increasingly to guide students in analyzing problems, evaluating evidence, and developing professional judgment. Universities should provide systematic support for faculty development, including: digital technology training; interdisciplinary research opportunities; cooperation with audit firms. However, faculty development should focus on integrating technology with auditing expertise rather than simply acquiring programming skills.

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7.4. Implications for Policymakers

Higher education policymakers should recognize that AI transformation in auditing education requires coordinated institutional support. Potential policy initiatives include: encouraging interdisciplinary education programs; supporting university–industry collaboration; promoting digital competency standards; facilitating responsible AI adoption. Such support can help universities develop sustainable approaches to auditing education transformation.

8. Conclusion

Artificial intelligence is changing the environment in which auditors operate and challenging traditional approaches to auditor education. While AI technologies provide new opportunities for improving audit efficiency and analytical capability, they also create questions regarding professional judgment, ethical responsibility, and the future definition of auditor competence. This study argues that the primary challenge facing auditing education is not simply the introduction of technological tools into existing curricula. Rather, it is the reconstruction of auditor competencies in response to changes in professional practice. Drawing on competency-based education theory and human–AI collaboration perspectives, this study develops an AI-era auditor competency framework consisting of three dimensions: (1) digital analytical capability; (2) human–AI collaborative judgment capability; (3) technology-related ethical and governance awareness. Based on this framework, the study proposes reforms in curriculum design, teaching approaches, practical training environments, faculty development, and assessment systems. The theoretical contribution of this study is that it reframes AI transformation in auditing education as a process of competency reconstruction rather than technology adoption. This perspective highlights that the future relevance of auditors will not depend solely on their ability to operate intelligent systems, but on their ability to combine technological capabilities with professional judgment and ethical responsibility. For universities, accounting firms, and professional organizations, the key challenge is therefore not whether AI should be incorporated into auditing education, but how AI can be integrated in ways that strengthen the distinctive professional characteristics of auditing. As intelligent technologies continue to evolve, successful auditing education will depend on developing professionals who can work effectively with AI while maintaining the judgment, skepticism, and ethical commitment that define the auditing profession.

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