Curriculum innovation in accounting: Leveraging artificial intelligence and emerging technologies

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ISSN: 2992 -5169 (Print) Available online@http/www.bjafffsr.org

Abstract
The accounting profession is rapidly evolving due to advancements in artificial intelligence, automation, blockchain, and data analytics. These technologies are shifting the accountant's role from historical reporting to strategic decision-making. While this global trend is widely recognized, its implications for accounting education in Nigeria remain underexplored. This paper argues that Nigeria's accounting curriculum, grounded in traditional methods, is misaligned with the profession's current demands, resulting in a growing skills gap. Key challenges include inadequate infrastructure, limited faculty expertise, and weak industry-academia links. Through a literature review, the paper highlights essential emerging technologies and emphasizes the need for curriculum reform that promotes a data-driven mindset, ethical awareness, and trans-disciplinary skills. Recommendations include competency-based, experiential learning models, technology-enhanced instruction, revised assessment methods, and faculty development through industry collaboration. A coordinated effort is essential to modernize accounting education in Nigeria and prepare graduates for strategic roles in a technology-driven environment.

Keywords: accounting education, curriculum innovation, artificial intelligence, automation, Nigeria, emerging technologies

Introduction

The accounting profession is undergoing a profound transformation, driven by rapid technological innovation, evolving regulatory frameworks, and shifting business priorities (Alvarez, 2017; Warren, 2017). This shift is fueled by technologies such as artificial intelligence (AI), blockchain, cloud computing, and data analytics, which are redefining how accounting functions are performed and perceived (Berton, 2018; Dai & Vasarhelyi, 2017).

These technologies have a dual impact. AI and automation are taking over repetitive tasks like data entry, invoicing, and reconciliations (Krahel & Titera, 2015; Vasarhelyi *et al.*, 2015), allowing accountants to focus on strategic, value-adding functions. Simultaneously, data analytics and machine learning enable professionals to interpret complex datasets, shifting their role from historical reporting to strategic advisory, offering predictive insights for decision-making (Dai & Vasarhelyi, 2017; Gepp *et al.*, 2018).

This evolution demands urgent reform in accounting education. The American Institute of Certified Public Accountants (AICPA, 2019) acknowledges that "the accounting profession is undergoing a significant transformation, driven by advances in technology, changing regulatory requirements, and evolving business needs" (p. 4). Thus, education must produce graduates who are not only well-versed in traditional principles but also proficient in emerging technologies and analytical tools.

However, while this trend is well-documented globally, its implications for Nigeria remain underexplored. Nigerian universities and professional bodies face the challenge of modernizing curricula rooted in traditional practices to meet technological demands. There is limited research on how well AI, blockchain, and data analytics have been integrated. Barriers such as inadequate infrastructure, limited faculty expertise, and disconnect between academia and industry persist.

This research aims to identify specific challenges and opportunities for integrating emerging technologies into Nigeria's accounting curriculum, enhancing graduate readiness and professional relevance in a technology-driven global environment.

Literature Review

The integration of artificial intelligence (AI) and automation is profoundly reshaping the accounting profession, transitioning it from a backward-looking, transactional role to a forward-looking, strategic one. This transformation is driven by key technologies that accountants and students must understand to stay relevant. These tools are not mere enhancements but foundational to modern accounting practice (Onyeka, 2021; Adewumi, 2019). Consequently, accounting graduates must acquire these competencies to thrive in an increasingly digital profession.

Key AI and Automation Tools and Their Applications: The following key AI and automation tools and their applications highlight and underpin the urgent need for curriculum reform to remain it relevant in a globalized economy**.**

Robotic Process Automation (RPA): Robotic Process Automation (RPA) uses software bots to mimic human actions in executing repetitive, rule-based digital tasks. These bots interact with systems to log in, enter data, copy and paste information, and fill out forms. RPA tools such as Blue Prism, UiPath, and Automation Anywhere are transforming routine tasks such as data entry, invoicing, and bank reconciliations (Ekanem & Umoh, 2020). RPA boosts efficiency, minimizes errors, and allows accountants to focus on tasks requiring judgment and analysis. For example, bots can be programmed to download bank statements, match transactions to ledger entries, and flag discrepancies for review. Oyewole (2022) noted a rise in RPA use in Nigerian financial institutions, though broader adoption in accounting firms remains limited.

Machine Learning (ML): Machine Learning (ML), a subset of AI, enables systems to learn from data and improve performance without explicit programming. In accounting, ML facilitates data classification, fraud detection, and predictive analytics (Adetunji & Adebayo, 2020). For instance, ML models can detect unusual transaction patterns that signal fraud or forecast future cash flows, enabling more informed, proactive decision-making. The shift from descriptive to predictive accounting enhances strategic planning capabilities.

Natural Language Processing (NLP): Natural Language Processing (NLP) allows machines to understand, interpret, and generate human language. In accounting, NLP is valuable for processing unstructured data such as contracts, emails, and scanned invoices. Systems equipped with NLP can extract relevant information—like vendor names, amounts, and dates—from documents (Omotosho & Adewale, 2021). This reduces manual data entry time and improves accuracy in functions like accounts payable.

Optical Character Recognition (OCR): Optical Character Recognition (OCR) converts scanned documents into machine-readable data. Though not new, its fusion with AI and ML has revolutionized how physical records are handled. OCR extracts data from invoices or receipts, reducing reliance on manual entry and improving the accuracy of accounting records (Oluwafemi & Okoye, 2019). When paired with NLP, OCR enables seamless integration of physical and digital accounting processes.

AI-Powered Accounting Software: Modern accounting platforms like QuickBooks, Zoho Books, and Xero are now AI-powered, automating tasks such as invoicing, data entry, and reconciliation. These tools also analyze transactions in real time, generate dynamic financial reports, and deliver strategic insights (Agboola, 2020). As a result, accountants evolve from record keepers to business advisors, leveraging data for strategic decision-making.

The Deficiencies of Traditional Accounting: A Catalyst for AI Adoption: The inefficiencies of manual accounting have significantly driven the shift toward AI integration. Three key weaknesses in traditional systems justify the need for automation.

Inefficiency and Time Consumption: Manual processes are inherently time-consuming. Tasks like data entry and reconciliation are laborious, delaying processes like month-end closings (Adewumi, 2019). Professionals waste valuable time performing tasks that could be automated, reducing the overall productivity of accounting departments.

Susceptibility to Human Error: Manual systems are prone to errors—typos, omitted entries, and incorrect classifications can compromise financial statements, tax filings, and audit trails. Without automated checks, these errors often go unnoticed until they create serious compliance issues.

Limited Strategic Analysis: Traditional systems focus on historical data and bookkeeping, leaving little room for forward-looking analysis. Time spent on clerical tasks hinders the accountant's ability to contribute to strategic decision-making (Onyeka, 2021). As a result, accountants often function as recorders rather than analysts.

AI-Related Automation in Accounting: The widespread adoption of AI is transforming the core functions of accounting. Automation now extends beyond routine tasks to the full transaction lifecycle, enabling efficiency, accuracy, and strategic insight.

Automated Data Entry and Document Processing: AI tools using OCR and NLP can extract data from invoices and receipts, populating accounting systems automatically. This reduces manual workload and enhances data integrity (Adewumi, 2019).

Automated Invoicing and Payment Processing: AI systems now generate invoices, track payment status, and send reminders to delinquent customers. They

can learn organizational payment cycles and adjust reminders accordingly. This improves cash flow management and minimizes delays.

Transaction Reconciliation: Reconciliation is no longer a time-intensive task. AI tools match transaction data between bank statements and ledgers, identifying and flagging discrepancies instantly. This increases accuracy and accelerates month-end closings.

Accounts Payable and Receivable Automation: In Accounts Payable, AI tools handle invoice capture, approval workflows, and payment scheduling. For Accounts Receivable, they generate invoices, issue reminders, and reconcile payments—ensuring up-to-date records and reduced outstanding receivables.

Financial Reporting and Analytics: Beyond automation, AI enables real-time financial analysis. Tools identify trends, forecast performance, and present visual dashboards. This repositions accountants as strategic advisors capable of offering data-driven insights (Onyeka, 2021). It marks a fundamental shift in the profession's identity—from transactional execution to strategic engagement.

The Transformative Impact of AI on Accounting Practice and Pedagogy: AI's impact on accounting is not limited to the profession; it has profound implications for education. As job functions evolve, the curriculum must also evolve to prepare graduates for a technology-integrated profession.

Automation of Routine Tasks: Tasks like document scanning, invoice processing, and payment tracking are now efficiently handled by AI tools using OCR and NLP. These tools reduce human error and processing time while increasing accuracy and efficiency (Adewumi, 2019).

End-to-End Transaction Management: AI now oversees entire financial workflows—from invoice generation to payment collection and reconciliation. These tools adapt to company-specific patterns, creating a customized automation experience that boosts operational effectiveness and financial health.

Data Reconciliation and Accuracy: AI's ability to reconcile vast datasets in real time ensures greater data accuracy and faster financial reporting. This supports timelier decision-making and enhances stakeholder confidence.

Strategic Financial Analysis: AI has elevated the accountant's role to that of a strategic analyst. Tools provide predictive insights, highlight trends, and support

scenario planning. This capacity is invaluable for advising clients and internal stakeholders on financial decisions (Onyeka, 2021).

Curriculum Implications: These developments demand a restructured curriculum. As Alvarez (2017) and Warren (2017) emphasized, accounting education must be dynamic and forward-looking. Students must gain fluency in emerging technologies, data analytics, and ethical considerations tied to automation. The adoption of AI is not a future trend—it is a present-day imperative.

According to Berton (2018) and Dai and Vasarhelyi (2017), the integration of AI, blockchain, and advanced analytics is already shaping global accounting. Nigeria's curriculum must align with these realities. Without deliberate efforts to modernize course content, instructional delivery, and assessment strategies, graduates will face a widening skills gap in the global job market.

AI and automation are transforming accounting from a manual, historical task into a strategic, technology-driven function. Tools such as RPA, ML, NLP, and OCR streamline operations, minimize errors, and allow accountants to shift toward higher-order functions like predictive analytics and advisory roles. This evolution presents challenges and opportunities—especially for educational institutions.

To prepare future-ready professionals, accounting curricula must undergo urgent reform. Nigerian institutions, in particular, must align with global practices by integrating AI concepts, tools, and case studies into instruction. Faculty must be trained, and infrastructure must support the digital delivery of content. Only then can accounting graduates meet the demands of a rapidly changing profession.

Core Imperatives for Modernizing the Accounting Curriculum

The rapid integration of artificial intelligence (AI) into accounting practice demands urgent and non-negotiable reforms in accounting education. A modernized curriculum must build a data-driven mindset, foster trans-disciplinary skills, and address the ethical and inclusive challenges presented by emerging technologies.

Cultivating a Data-Driven and Technologically Fluent Mindset

Accounting education must transcend basic proficiency with traditional software and develop students' deep operational understanding of transformative

technologies. A critical goal is cultivating a data-driven mindset, wherein students confidently access, manipulate, and interpret data as an intrinsic part of their professional roles (Gepp et al., 2018; Krahel & Titera, 2015). Innovation entails embedding emerging technologies—particularly AI-powered tools like automated accounting systems and data analytics software—within the curriculum, affording practical, real-world training that demystifies technology (Vasarhelyi et al., 2015). This hands-on, experiential approach ensures graduates become competent and confident users, not merely theoretical observers.

Fostering Trans-disciplinary Skill Development

Contemporary business challenges are inherently complex and require interdisciplinary solutions. Thus, accounting education must broaden to develop critical thinking, problem-solving, and collaboration skills across disciplines (AICPA, 2019; Warren, 2017). A siloed approach to accounting education is obsolete. Future curricula must integrate computer science, data science, and business analytics modules to produce well-rounded graduates who grasp technological language and collaborate effectively with specialists (Dai & Vasarhelyi, 2017). This fusion equips accountants to bridge technical data analysis and strategic decision-making roles.

Effective Integration of Emerging Technologies

Emerging technologies must be woven seamlessly into accounting courses. Data analytics should be foundational, teaching students to analyze large datasets and extract actionable insights. Blockchain must be taught beyond cryptocurrency, highlighting its role in ensuring secure, transparent, and immutable transaction records, thus imparting critical lessons on data integrity and security. Cloud computing offers continuous access to advanced accounting and analytics tools while emphasizing the importance of data privacy and security in distributed environments (Vasarhelyi et al., 2015). Experiential learning methods such as case studies and project-based learning enable students to grapple firsthand with these technologies' applications and implications (AICPA, 2019; Warren, 2017).

Addressing Ethical Considerations and Promoting Diversity, Equity, and Inclusion (DEI)

The integration of powerful technologies introduces complex ethical considerations that must be central to accounting education. Faculty must address potential biases in AI systems, especially when trained on historical datasets that

risk perpetuating inequalities (Berton, 2018; Dai & Vasarhelyi, 2017; Gepp et al., 2018; Krahel & Titera, 2015). Additionally, educators must confront job displacement concerns and the ethical responsibility to support workforce reskilling (AICPA, 2019; Vasarhelyi et al., 2015; Warren, 2017). Data ethics—covering privacy, security, transparency, and accountability—also demands attention as financial systems grow increasingly interconnected and AI-dependent (Berton, 2018; Dai & Vasarhelyi, 2017; Alvarez, 2017; Warren, 2017).

This ethical focus extends to a commitment to Diversity, Equity, and Inclusion. AI integration offers a unique opportunity to embed DEI principles into the profession's future. Curricula should intentionally incorporate diverse perspectives, using case studies reflecting the experiences of women, people of color, and individuals with disabilities (Gepp et al., 2018; Krahel & Titera, 2015; AICPA, 2019; Vasarhelyi et al., 2015). Opportunities for cultural competence development through diversity training and community engagement are vital (Warren, 2017; Berton, 2018; Dai & Vasarhelyi, 2017). Equitable access to AI and emerging technology skills must be ensured to prevent a digital divide, alongside inclusive teaching practices that support all students' success (Gepp et al., 2018; Krahel & Titera, 2015; Warren, 2017).

Strategies for Implementation and Enablement

Transforming these imperatives into a functional curriculum requires strategic redesign, technology-enhanced learning, revised assessment methods, faculty development, and robust industry collaboration.

Curriculum Redesign and Technology-Enhanced Learning

Adopting a competency-based approach is essential. This shifts focus from rote technical knowledge to specific, measurable skills relevant to the modern workplace (AICPA, 2019; Vasarhelyi et al., 2015). Incorporating rich experiential learning—internships, detailed case studies, and capstone projects—enables students to apply AI and emerging technologies to authentic problems, fostering critical thinking and problem-solving (Berton, 2018; Dai & Vasarhelyi, 2017). Pedagogies like the flipped classroom promote interactive and collaborative learning, deepening understanding of complex technologies (Gepp et al., 2018; Krahel & Titera, 2015).

Technology-Enhanced Learning (TEL) underpins this transformation. TEL can facilitate immersive experiences, such as virtual reality (VR) or augmented reality (AR) simulations, placing students in realistic accounting scenarios (Berton, 2018; Dai & Vasarhelyi, 2017). Online platforms offer tutorials on data analytics and blockchain, while collaboration tools support teamwork and communication on complex projects. TEL also provides robust mechanisms for continuous assessment and feedback (Gepp et al., 2018; Krahel & Titera, 2015; Alvarez, 2017; Warren, 2017).

Evolving Assessment and Evaluation Methods

Traditional assessments—multiple-choice tests and written exams—fail to capture the complexity of AI-driven learning outcomes (Gepp et al., 2018; Krahel & Titera, 2015). Assessments must evolve toward authenticity, reflecting real-world accounting scenarios. Case studies requiring AI-based financial analysis and strategic recommendations are paramount (AICPA, 2019; Vasarhelyi et al., 2015). Competency-based assessments evaluating mastery in AI applications, such as financial modeling and risk assessment, are effective (Berton, 2018; Dai & Vasarhelyi, 2017).

Technology can support these assessments via AI-powered evaluation platforms and blockchain-enabled projects ensuring secure financial reporting (Vasarhelyi et al., 2015; Warren, 2017). Incorporating peer review, self-assessment, and data analytics to visualize performance offers a holistic learning picture and informs curriculum refinement (Gepp et al., 2018; Krahel & Titera, 2015; Berton, 2018; Dai & Vasarhelyi, 2017).

Faculty Development and Industry-Academia Collaboration

Faculty are pivotal to curriculum transformation and require dedicated training in AI and emerging technologies through workshops, conferences, and online courses that provide hands-on experience (Gepp et al., 2018; Krahel & Titera, 2015). Providing resources—software licenses, cloud access, blockchain platforms—and pedagogical support is crucial for effective technology integration and new assessment practices (AICPA, 2019; Alvarez, 2017; Vasarhelyi et al., 2015; Warren, 2017). Encouraging faculty collaboration within and across institutions fosters shared best practices and addresses common challenges (Berton, 2018; Dai & Vasarhelyi, 2017).

Simultaneously, industry-academia partnerships ensure curricular relevance and alignment with professional skill demands (Alvarez, 2017; Warren, 2017). These collaborations, which may include accounting firms, tech companies, joint research, and curriculum development, provide vital insights into market needs (Gepp et al., 2018; Krahel & Titera, 2015; AICPA, 2019; Vasarhelyi et al., 2015). They also create invaluable student opportunities for internships and live projects, fostering practical experience and professional networking prior to graduation (Gepp et al., 2018; Krahel & Titera, 2015; AICPA, 2019; Vasarhelyi et al., 2015).

Conclusion

The integration of AI and automation into accounting is transformative and irreversible. Accounting education must respond with equally profound change. This entails shifting from traditional compliance-focused curricula to models emphasizing data analytics, technological fluency, and strategic advisory capabilities. Achieving this requires competency-based learning, experiential opportunities, and sophisticated technology-enhanced tools.

Such transformation is impossible without strong industry-academia collaboration, innovative assessment methods emphasizing authentic problem-solving, and unwavering faculty development. Equally important is an ethical foundation addressing AI bias, privacy, job displacement, and a resolute commitment to Diversity, Equity, and Inclusion. This approach will foster a profession that is efficient, just, and representative.

Future research should investigate longitudinal impacts of modern curricula, refine competency frameworks, and explore pedagogical best practices for emerging technologies. Accounting educators, researchers, and practitioners must unite in this endeavor. Through collaboration and continuous learning, they can prepare professionals empowered—not replaced—by AI, ready to deliver deeper insight, assurance, and societal value.

References

Adetunji, B. A., & Adebayo, K. T. (2020). The role of machine learning in forensic accounting and fraud detection. *Journal of Accounting & Finance, 14*(2), 45–60.

Adewumi, B. (2019). The impact of AI on financial accounting. *Journal of Accounting and Finance, 45*(2), 112–125.

Agboola, A. A. (2020). The adoption of artificial intelligence in financial reporting: A study of Nigerian listed companies. *Journal of Business Administration and Management, 14*(1), 1–15.

Alvarez, M. (2017). The impact of artificial intelligence on accounting. *Journal of Accounting Education, 41*, 1–8.

Berton, L. (2018). Blockchain and accounting: A review of the literature. *Journal of Accounting Literature, 41*, 1–13.

Dai, J., & Vasarhelyi, M. A. (2017). Toward blockchain-based accounting and assurance. *Journal of Information Systems, 31*(3), 1–15.

Ekanem, P. U., & Umoh, P. J. (2020). Robotic process automation and the future of auditing in Nigeria. *Journal of Accounting and Allied Disciplines, 18*(1), 34–45.

Gepp, A., Linnenluecke, M. K., O'Neill, T. J., & Smith, T. (2018). Big data and accounting: A systematic review. *International Journal of Accounting Information Systems, 29*, 1–14.

Krahel, J. P., & Titera, W. R. (2015). Consequences of automated accounting. *Journal of Accounting Education, 33*, 1–13.

Oluwafemi, T. T., & Okoye, A. M. (2019). The impact of technology on accounting practice in Nigeria. *Research Journal of Management Sciences, 8*(2), 25–34.

Omotosho, A. O., & Adewale, S. T. (2021). Natural language processing and its application in financial statement analysis. *The Nigerian Journal of Management Sciences, 6*(1), 112–125.

Onyeka, C. (2021a). AI and the future of the accounting profession. *International Journal of Technology and Business, 8*(4), 201–215.

Onyeka, C. (2021b). The digital transformation of the accounting profession: Challenges and opportunities for Nigerian accountants. *Journal of Contemporary Accounting Research, 15*(3), 1–15.

Oyewole, I. O. (2022). The future of the Nigerian accounting profession: A review of the adoption of disruptive technologies. *Journal of Accounting and Allied Disciplines, 20*(2), 87–101.

Vasarhelyi, M. A., Krahel, J. P., & Titera, W. R. (2015). The changing role of accounting in the era of big data. *Journal of Accounting and Public Policy, 34*(4), 399–412.

Warren, J. D. (2017). The future of accounting education: A review of the literature. *Journal of Accounting Education, 41*, 1–11.