
ARTIFICIAL INTELLIGENCE ENABLED TEACHING OF SUSTAINABILITY REPORTING AND DISCLOSURE IN ACCOUNTING EDUCATION: A CONCEPTUAL FRAMEWORK FOR PROFESSIONAL COMPETENCE

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ABSTRACT

The growing demand for credible sustainability-related disclosures has changed the competence expected of accounting graduates, accounting educators and professional accountants. Sustainability reporting is now linked to corporate reporting, governance, risk assessment, assurance and decision usefulness, particularly with the emergence of the GRI Standards, IFRS S1, IFRS S2, European Sustainability Reporting Standards and national adoption initiatives in jurisdictions such as Nigeria. At the same time, artificial intelligence is reshaping how sustainability information is collected, classified, analysed, interpreted and communicated. This paper examines how artificial intelligence can be used responsibly in teaching sustainability reporting and disclosure in accounting education. The paper adopts a conceptual and narrative review approach, drawing on literature relating to sustainability reporting, accounting education, artificial intelligence, responsible AI, professional competence and sustainability assurance. It proposes an AI-enabled teaching framework that connects reporting standards, sustainability data sources, natural language processing, machine learning, dashboards, generative AI support, classroom simulations, case-based learning and ethical safeguards. The paper argues that AI should not replace professional judgement; rather, it should be used as a learning support that strengthens data literacy, critical thinking, standards application, assurance readiness, ethical reasoning and evidence-based communication. The paper contributes to accounting education by offering a practical framework that can be adapted for undergraduate teaching, postgraduate seminars and professional training. It concludes that effective integration of AI requires curriculum

redesign, faculty development, data governance, academic integrity controls, institutional investment and continuous alignment with global and national sustainability reporting standards.

KEYWORDS: sustainability reporting; artificial intelligence; accounting education; ESG disclosure; IFRS S1; IFRS S2; GRI Standards; professional competence; responsible AI.

1. INTRODUCTION

Sustainability reporting has moved from a largely voluntary corporate social responsibility practice to a central issue in corporate reporting, governance and accountability. Investors, regulators, communities, employees and civil society now expect organisations to provide reliable information on how business activities affect the economy, the environment and society, and how sustainability-related risks and opportunities affect enterprise value. This shift has widened the work of accountants beyond the preparation of historical financial statements to include sustainability measurement, disclosure, assurance and interpretation (Bebbington & Unerman, 2018; Deegan, 2020; Stubbs & Higgins, 2014).

The reporting environment has become more structured with the development of global sustainability reporting frameworks and standards. The GRI Standards provide an impact-oriented approach to reporting on an organisation's effects on the economy, environment and people, while IFRS S1 and IFRS S2 provide a global baseline for sustainability-related financial disclosures and climate-related disclosures for users of general purpose financial reports (Global Reporting Initiative [GRI], 2021; IFRS Foundation, 2023a, 2023b). The European Sustainability Reporting Standards under the Corporate Sustainability Reporting Directive have also increased regulatory expectations for detailed sustainability information, including value-chain and double-materiality considerations (European Commission, 2026).

Nigeria is also moving in this direction. The Financial Reporting Council of Nigeria has issued a roadmap for the adoption of IFRS Sustainability Disclosure Standards and has continued to provide guidance for implementation. These developments make sustainability reporting competence important for Nigerian accounting students, lecturers, firms and professional bodies (Financial Reporting Council of Nigeria [FRCN], 2024, 2026). The implication is that sustainability reporting should no longer be treated as a peripheral topic in accounting education, especially where graduates are expected to work in reporting, auditing, tax advisory, consulting, public sector accountability and corporate governance roles.

Artificial intelligence offers a practical way of strengthening the teaching of sustainability reporting. AI tools can assist students to extract information from annual reports, classify environmental, social and governance themes, compare disclosures with standards, identify gaps, analyse trends, evaluate narrative tone and develop evidence-based judgement. In accounting and auditing, AI and data analytics are already influencing transaction classification, risk assessment, fraud detection, document review and assurance procedures, making digital competence increasingly relevant to accounting education (Appelbaum et al., 2017; Kokina & Davenport, 2017; Moll & Yigitbasioglu, 2019).

However, AI must be introduced with caution. Generative AI systems may produce inaccurate, biased or unsupported outputs, while students may rely on automated answers without understanding the underlying reporting standards or evidence. UNESCO's guidance on generative AI in education stresses the need for human-centred use, transparency, data protection, equity and institutional policies, and the European Union's AI Act also reflects growing international attention to trustworthy and accountable AI systems (European Commission, 2024; UNESCO, 2023). For accounting education, this means AI should support learning rather than replace professional scepticism, verification and ethical judgement.

This paper therefore argues for an AI-enabled, standards-based and ethics-conscious approach to teaching sustainability reporting and disclosure. It develops a conceptual framework that links sustainability reporting standards, corporate sustainability data, AI applications, classroom activities and professional competence outcomes. The paper is intended for accounting lecturers, curriculum designers, professional bodies and higher education institutions seeking to prepare students for a reporting environment in which sustainability disclosure, assurance and digital competence are becoming central to professional practice.

1.1 Statement of the Problem

Many accounting programmes still approach corporate reporting mainly through the traditional financial reporting lens. While financial accounting remains foundational, the current reporting environment requires students to understand sustainability-related disclosures, materiality assessment, climate-related risks, governance information, sustainability assurance, data analytics and ethical reporting. A curriculum that treats sustainability reporting as an optional or minor topic may not adequately prepare graduates for current professional expectations (Deegan, 2020; IFAC, 2025).

A related problem is that sustainability information is complex, textual, multi-source and judgement-based. Students may find it difficult to interpret lengthy annual reports, compare disclosures against standards, distinguish substantive reporting from symbolic disclosure and evaluate the credibility of sustainability claims. Literature on sustainability reporting has long noted concerns about legitimacy-seeking, selective disclosure and greenwashing, which make critical judgement essential in accounting education (Cho et al., 2015; Deegan, 2002; Gray et al., 1995).

A third problem concerns the responsible use of AI. Although AI can improve access to data and support analysis, it can also create risks relating to plagiarism, data privacy, algorithmic bias, misinformation and over-reliance on automated outputs. Accounting education therefore requires a balanced model that teaches students to use AI as an analytical assistant while retaining professional judgement, scepticism, accountability and ethical responsibility (Floridi et al., 2018; O'Neil, 2016; Rudin, 2019; UNESCO, 2023).

1.2 Objectives of the Paper

The main objective of this paper is to develop a professional and pedagogically sound framework for integrating artificial intelligence into the teaching of sustainability reporting and disclosure in accounting education. The specific objectives are to:

- examine the relevance of artificial intelligence in teaching sustainability reporting and disclosure in accounting education;
- review major sustainability reporting and assurance developments that shape accounting education and professional competence;
- develop a conceptual framework for integrating AI tools into sustainability reporting pedagogy;
- identify the benefits, risks and ethical safeguards associated with AI-enabled sustainability reporting education; and
- provide practical recommendations for lecturers, accounting departments, professional bodies and higher education institutions.

1.3 Research Questions

- How can artificial intelligence improve the teaching and learning of sustainability reporting and disclosure in accounting education?
- What competences should accounting students develop in an AI-enabled sustainability reporting curriculum?

- What ethical, technical and institutional challenges may affect the integration of AI into sustainability reporting education?
- What framework can guide educators in applying AI tools responsibly to sustainability reporting instruction?

1.4 Significance of the Paper

This paper is significant to accounting educators because it provides a structured guide for moving from concept-based sustainability reporting lectures to applied, data-supported and standards-based teaching. It is also useful to students because it identifies the digital, analytical and ethical competences needed for modern reporting practice. The focus on AI-supported learning is particularly relevant because the accounting profession increasingly expects graduates to work with digital tools while maintaining professional scepticism and accountability (Appelbaum et al., 2017; IFAC, 2025).

The paper is relevant to professional accounting bodies because sustainability reporting and sustainability assurance are now part of professional education and continuing professional development. IFAC's sustainability-related revisions to International Education Standards 2, 3 and 4 emphasise sustainability analysis, reporting, assurance, professional skills and ethics for aspiring professional accountants (IFAC, 2025). The paper is also useful to universities, polytechnics and regulators in Nigeria because the implementation of sustainability disclosure standards requires a pipeline of accountants who understand both sustainability principles and digital reporting tools (FRCN, 2024, 2026).

2. METHODOLOGY

This paper adopts a conceptual and narrative review methodology. A conceptual review is appropriate because the purpose is not to test statistical relationships but to synthesize relevant knowledge and develop a framework that can guide teaching practice. Conceptual papers are useful where a field is developing and where scholars need to clarify constructs, connect bodies of literature and propose models for future empirical testing.

The review draws on five streams of literature and guidance: sustainability reporting and disclosure; sustainability reporting standards and assurance; artificial intelligence in accounting and auditing; AI in higher education; and professional competence and ethics. The reviewed materials include academic journal articles, professional standards, regulatory guidance and institutional publications from bodies such as the IFRS Foundation, GRI, FRCN, IAASB, IFAC, UNESCO and the European Commission (European Commission,

2024, 2026; FRCN, 2024, 2026; GRI, 2021; IAASB, 2024; IFAC, 2025; IFRS Foundation, 2023a, 2023b; UNESCO, 2023).

The analysis followed a narrative synthesis. First, the paper identified the competence demands created by sustainability reporting standards and assurance expectations. Second, it examined how AI applications such as natural language processing, machine learning, dashboards and generative AI can support teaching and learning. Third, it linked these insights to learning theories and professional ethics. Finally, it developed a framework and teaching model that can be adapted by accounting educators.

The limitation of the methodology is that it does not provide primary evidence from students, lecturers or institutions. However, the conceptual approach is suitable for developing a structured teaching model that can be tested in future research through surveys, classroom experiments, interviews, learning analytics, case studies or curriculum implementation studies.

3. Literature Review

3.1 Sustainability Reporting and Disclosure

Sustainability reporting refers to the process through which organisations disclose information about their economic, environmental, social and governance performance. It enables stakeholders to assess how organisations create, preserve or erode value over time. Sustainability disclosure includes information on environmental impact, climate-related risks, labour practices, human rights, anti-corruption measures, community relations, governance structures and risk management systems (Bebbington & Unerman, 2018; GRI, 2021).

The GRI Standards remain among the most widely used standards for impact-oriented sustainability reporting. The revised Universal Standards emphasise reporting principles, material topics, governance, stakeholder engagement and organisational context (GRI, 2021). The GRI approach is important for accounting education because it encourages students to think about organisational impacts, stakeholder accountability and the evidence needed to support sustainability claims.

IFRS S1 and IFRS S2 have introduced a more investor-oriented approach to sustainability-related financial disclosure. IFRS S1 requires disclosure of material information about sustainability-related risks and opportunities that could reasonably be expected to affect an entity's prospects, while IFRS S2 focuses on climate-related risks and opportunities (IFRS Foundation, 2023a, 2023b). For accounting students, these standards create a need to

understand governance, strategy, risk management, metrics and targets within a sustainability reporting context.

The European Sustainability Reporting Standards broaden the discussion through the Corporate Sustainability Reporting Directive, which requires affected companies to report according to the ESRS. The European framework emphasises detailed sustainability information and the principle of double materiality, which considers both the effect of sustainability matters on the entity and the entity's impact on people and the environment (European Commission, 2026). The coexistence of impact materiality, financial materiality and double materiality means that accounting education must help students compare reporting frameworks rather than memorise them in isolation.

3.2 Sustainability Reporting and Disclosure in Nigeria

Nigeria provides an important context for sustainability reporting education because the country has taken steps toward the adoption of IFRS Sustainability Disclosure Standards. The FRCN roadmap indicates a national movement toward sustainability-related financial disclosure and places pressure on companies, auditors, accounting educators and professional bodies to develop implementation capacity (FRCN, 2024). The FRCN's subsequent sustainability reporting guidance reinforces the need for practical competence in sustainability reporting and assurance (FRCN, 2026).

This development is significant because Nigeria faces sustainability issues that are central to corporate reporting and public accountability, including oil and gas environmental impacts, climate vulnerability, social accountability concerns, waste management, energy transition challenges and governance risks. Accounting students in Nigeria should therefore be trained to interpret sustainability disclosures in ways that reflect both international standards and local institutional realities (Deegan, 2020; FRCN, 2024, 2026).

The Nigerian context also highlights the need for accessible and practical teaching methods. Many institutions may not have expensive sustainability databases or advanced analytics laboratories. AI-enabled teaching can still be introduced through public annual reports, sustainability reports, spreadsheet-based datasets, open-source tools, guided prompts and lecturer-verified exercises. The important point is not the sophistication of the software but the quality of the learning design and the discipline of verification.

3.3 Artificial Intelligence in Accounting and Accounting Education

Artificial intelligence refers to computer-based systems capable of performing tasks that normally require human intelligence, including pattern recognition, classification, prediction, natural language processing and decision support. In accounting, AI is increasingly

associated with audit analytics, fraud detection, transaction classification, risk assessment, forecasting, document review and continuous monitoring (Appelbaum et al., 2017; Kokina & Davenport, 2017; Moll & Yigitbasioglu, 2019).

The relevance of AI to accounting education lies in its ability to expose students to the digital environment in which professional work is changing. Rather than teaching accounting as a purely manual activity, educators can use AI and analytics tools to help students work with real or simulated datasets, evaluate evidence and communicate results. This approach is consistent with the broader view that professional accountants require technical competence, professional skills, ethics and the ability to respond to emerging societal demands (IFAC, 2025).

In sustainability reporting education, AI can help students extract information from corporate reports, code sustainability narratives, identify recurring ESG themes, compare disclosures across companies, create dashboards and assess consistency between narrative claims and quantitative indicators. Natural language processing can be used to analyse climate-related narratives, while machine learning can support classification of disclosure themes. Generative AI can assist with explanation, formative feedback and drafting, but it must be accompanied by source verification and academic integrity safeguards (Holmes et al., 2019; UNESCO, 2023; Zawacki-Richter et al., 2019).

3.4 Teaching Sustainability Reporting with Artificial Intelligence

Teaching sustainability reporting with AI involves more than introducing students to software. It requires learning activities in which students apply reporting standards to real or simulated corporate data, use AI tools to analyse disclosure content and then exercise professional judgement in interpreting results. For example, students may use text analysis to identify the frequency of climate-related terms in annual reports, but they must still determine whether the disclosures are specific, measurable, balanced and decision-useful (GRI, 2021; IFRS Foundation, 2023b).

AI-enabled teaching can strengthen case-based learning. Students may be assigned a listed company and asked to examine its sustainability disclosures against GRI, IFRS S1, IFRS S2, ESRS or national guidance. AI tools can assist students to summarise disclosures, locate missing information, compare year-on-year changes and identify possible greenwashing indicators. The lecturer's role remains central because students must verify the AI output, consult the relevant standard and prepare a professional report grounded in evidence (Cho et al., 2015; Deegan, 2020; UNESCO, 2023).

Simulation is also important. Students can be placed in roles such as sustainability accountant, internal auditor, assurance practitioner, investor analyst or regulator. They can use AI dashboards to review ESG data and make decisions about materiality, disclosure quality and assurance risk. Such activities help students connect theory, standards, technology and ethical responsibility, which is consistent with experiential approaches to professional learning (Kolb, 1984; Mishra & Koehler, 2006).

3.5 Sustainability Assurance and the Implication for Teaching

Sustainability reporting education should not end with the preparation of disclosures. It should also expose students to assurance readiness because users of sustainability information increasingly expect credible and verifiable reports. The IAASB issued International Standard on Sustainability Assurance 5000 as a global standard for sustainability assurance engagements across different sustainability topics and reporting frameworks (IAASB, 2024). For accounting education, sustainability assurance means students should learn how to evaluate evidence, assess internal controls over sustainability information, identify reporting risks and recognise the ethical implications of misleading disclosure. AI can support assurance learning by helping students identify anomalies, compare disclosures with evidence and document audit trails. However, the final judgement about assurance risk and disclosure credibility must remain with trained professionals (IAASB, 2024; IFAC, 2025).

4. Theoretical Framework

4.1 Constructivist Learning Theory

Constructivist learning theory suggests that students learn effectively when they actively construct knowledge through inquiry, problem solving, collaboration and reflection. AI-enabled sustainability reporting education aligns with this theory because students do not merely receive definitions of sustainability reporting; they interact with corporate reports, datasets, standards and analytical tools. They learn by applying concepts to real reporting problems and reflecting on the quality of their evidence and conclusions.

4.2 Experiential Learning Theory

Experiential learning emphasises the movement from concrete experience to reflection, conceptualisation and application. In sustainability reporting education, students can examine real annual reports, apply AI tools to analyse disclosures, reflect on ethical and technical issues and then produce revised reporting outputs. This cycle strengthens practical competence because students learn by doing rather than by memorising definitions alone (Kolb, 1984).

4.3 Technological Pedagogical Content Knowledge

The technological pedagogical content knowledge framework explains that effective teaching with technology requires the integration of subject content, pedagogy and technology. In this paper, content knowledge includes sustainability reporting standards and accounting concepts; pedagogical knowledge includes case methods, simulation, reporting laboratories and assessment; and technological knowledge includes AI tools, text analytics, dashboards and data governance. Effective curriculum design requires alignment among these dimensions (Mishra & Koehler, 2006).

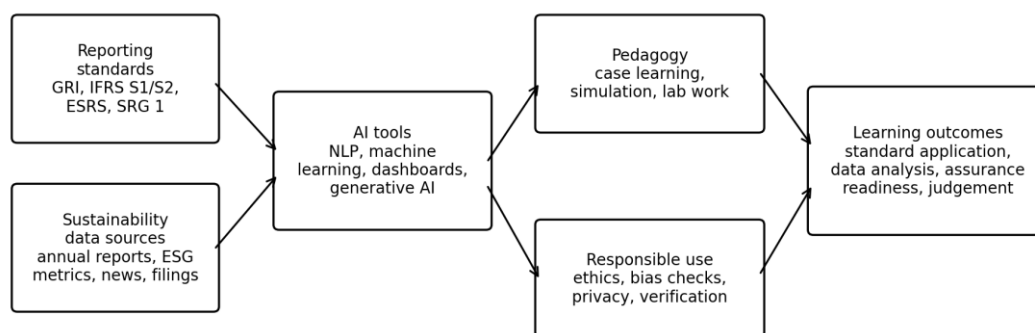
4.4 Stakeholder and Legitimacy Perspectives

Stakeholder theory explains why organisations disclose sustainability information in response to the expectations of investors, employees, customers, communities, regulators and society (Freeman, 1984; Roberts, 1992). Legitimacy theory explains how organisations use disclosure to demonstrate that their operations are consistent with social norms and expectations (Deegan, 2002; Suchman, 1995). These perspectives are relevant to teaching because students must learn to evaluate whether sustainability reporting is substantive and accountable or merely symbolic and legitimacy-seeking.

5. Conceptual Framework for AI-Enabled Sustainability Reporting Education

The framework proposed in this paper links five elements: sustainability reporting standards, sustainability data sources, AI tools, pedagogical activities and competence outcomes. The central argument is that AI should serve as a learning amplifier rather than a substitute for professional reasoning. Used responsibly, AI can help students move from awareness of sustainability reporting concepts to practical application, critical evaluation, assurance readiness and ethical judgement (IFAC, 2025; UNESCO, 2023).

The framework begins with reporting standards because students need a disciplined basis for judging disclosure quality. It then moves to sustainability data sources such as annual reports, sustainability reports, assurance reports, regulatory filings, company websites and ESG datasets. AI applications are introduced only after students understand the reporting question and the relevant standard. Pedagogical activities such as cases, simulations, reporting laboratories and reflective writing then help students convert AI-supported analysis into professional competence.

AI-enabled teaching framework for sustainability reporting and disclosure**Figure 1. AI-enabled teaching framework for sustainability reporting and disclosure in accounting education.**

Framework element	Main components	Expected learning outcome
Reporting standards	GRI Standards, IFRS S1, IFRS S2, ESRS, Nigeria SRG 1 and sector guidance.	Students learn disclosure requirements, materiality, governance, strategy, risk management, metrics and targets.
Data sources	Annual reports, sustainability reports, assurance reports, company websites, regulatory filings and ESG datasets.	Students learn data extraction, source evaluation, triangulation and reliability assessment.
AI applications	Natural language processing, sentiment analysis, classification, machine learning, dashboards and generative AI support.	Students learn text analysis, trend identification, gap analysis, visualization and AI-assisted interpretation.
Pedagogical activities	Case studies, simulations, reporting laboratories, group projects, peer review and reflective writing.	Students learn application, collaboration, communication and professional judgement.
Responsible AI safeguards	Privacy rules, human verification, bias checks, citation discipline, audit trail and academic integrity policy.	Students learn ethical use, accountability, professional scepticism and transparency.
Competence outcomes	Sustainability reporting competence, digital literacy, assurance readiness and ethical reasoning.	Students are prepared for sustainability accounting, reporting, assurance and advisory practice.

Source: Author's conceptual synthesis based on GRI (2021), IFRS Foundation (2023a, 2023b), Kolb (1984), Mishra and Koehler (2006), UNESCO (2023) and IFAC (2025).

6. Proposed AI-Enabled Teaching Model

The teaching model proposed in this paper is organised into seven stages. Each stage combines a reporting focus, a learning task, an AI-supported activity and a judgement-based

output. The model can be adapted for undergraduate courses, postgraduate seminars and professional training workshops.

Stage	Teaching focus	AI-supported activity	Student output
Stage 1: Orientation	Introduce sustainability reporting concepts, ESG, materiality and current standards.	AI-assisted glossary building and concept mapping, followed by lecturer correction.	Short concept note on sustainability reporting and professional relevance.
Stage 2: Standards mapping	Compare GRI, IFRS S1, IFRS S2, ESRS and national guidance.	AI-supported summary of standards, verified against original standard documents.	Matrix showing similarities, differences and reporting implications.
Stage 3: Data extraction	Collect sustainability information from company reports.	NLP extraction of ESG keywords, metrics, themes and page references.	Clean disclosure dataset with source references and limitations.
Stage 4: Disclosure analysis	Assess completeness, balance, specificity and comparability.	Text classification, sentiment review and gap analysis.	Disclosure quality report with evidence-based findings.
Stage 5: Materiality judgement	Identify material sustainability issues for an organisation.	AI-supported clustering of issues and stakeholder concerns.	Materiality rationale with supporting evidence.
Stage 6: Assurance readiness	Evaluate evidence, internal controls and reporting risks.	Checklist analytics, anomaly identification and audit-trail review.	Assurance planning memorandum.
Stage 7: Reflection and ethics	Discuss bias, privacy, greenwashing, professional scepticism and academic integrity.	AI output verification, error analysis and responsible-use declaration.	Reflective essay on responsible AI use in sustainability reporting.

Source: Author's proposed model, informed by IFAC (2025), IAASB (2024), UNESCO (2023) and the experiential learning approach of Kolb (1984).

6.1 Classroom Activities and Practical Applications

AI-supported sustainability report review: Students select a listed company and use AI tools to extract climate, environmental, social and governance disclosures. They compare the output with the original report and prepare a disclosure quality assessment. The activity should require page references and direct comparison with the applicable standard.

IFRS S2 climate disclosure simulation: Students are given a fictional company with climate risks, emissions data, governance information and transition-plan assumptions. They prepare a climate-related disclosure note and identify the evidence needed for assurance in line with IFRS S2 and sustainability assurance expectations (IAASB, 2024; IFRS Foundation, 2023b).

Greenwashing detection exercise: Students compare optimistic sustainability narratives with quantitative indicators such as emissions, fines, energy consumption, health and safety incidents or waste data. The exercise develops professional scepticism and balanced reporting judgement (Cho et al., 2015; Deegan, 2002).

Dashboard project: Students create a dashboard showing selected ESG metrics over time. They explain trends, limitations and implications for stakeholders. The dashboard should be assessed not only on appearance but on data quality, relevance and interpretation.

Responsible AI audit trail: Students document each prompt, output, verification step and final professional judgement. This promotes transparency, academic integrity and accountability, which are central to responsible AI use in education (UNESCO, 2023).

6.2 Assessment Strategy

Assessment in AI-enabled sustainability reporting education should not reward unverified AI output. It should evaluate the student's ability to apply standards, verify evidence, explain limitations and exercise professional judgement. A balanced assessment strategy may include written reports, oral defence, reflective commentary, disclosure matrices, datasets, dashboards and prompt logs (Holmes et al., 2019; UNESCO, 2023).

Criterion	Assessment focus	Suggested weight
Standards application	Accurate use of GRI, IFRS S1, IFRS S2, ESRS or relevant national guidance.	20%
Data handling	Proper sourcing, cleaning, documentation and reliability assessment.	20%
AI use and verification	Transparent prompts, verification of output and correction of errors.	20%
Professional judgement	Clear reasoning on materiality, disclosure quality and assurance risks.	20%
Ethics and communication	Responsible AI use, citation discipline, privacy awareness and clear writing.	20%

7. Benefits of AI Integration in Teaching Sustainability Reporting

Improved data literacy: Students gain experience in collecting, cleaning, analysing and interpreting sustainability information from multiple sources. This prepares them for a reporting environment in which accounting evidence is increasingly digital and multi-format (Appelbaum et al., 2017; Moll & Yigitbasioglu, 2019).

Practical exposure to real reports: Students move beyond theoretical definitions and engage directly with annual reports, sustainability reports, assurance reports and regulatory filings. This makes sustainability reporting more concrete and professionally relevant.

Enhanced critical thinking: AI outputs require verification. When assignments are properly designed, students learn to question evidence, assumptions, narrative tone and disclosure quality rather than accepting automated summaries.

Better understanding of standards: AI-supported mapping can help students navigate lengthy standards, while lecturers ensure that students return to the original standards for accurate interpretation (GRI, 2021; IFRS Foundation, 2023a, 2023b).

Preparation for professional practice: Students develop skills relevant to sustainability accounting, reporting, assurance, consulting and ESG analysis. This aligns with the sustainability-related revisions to professional education expectations (IFAC, 2025).

Inclusive and interactive learning: Dashboards, simulations and feedback tools can support different learning styles and make complex reporting concepts more accessible, provided that access and equity issues are addressed (Holmes et al., 2019; UNESCO, 2023).

8. Challenges and Ethical Considerations

Despite its benefits, AI integration raises important risks. First, AI tools can generate inaccurate or fabricated information. In sustainability reporting education, this is especially risky because students may rely on AI summaries without checking the original corporate reports or standards. Second, AI systems may reproduce bias from training data, leading to distorted interpretation of sustainability performance. Third, data privacy concerns may arise if students upload confidential or proprietary company information into public AI tools (Floridi et al., 2018; O’Neil, 2016; Rudin, 2019; UNESCO, 2023).

Academic integrity is another concern. Students may use generative AI to produce assignments without understanding the content. Therefore, lecturers should require AI-use declarations, prompt logs, oral defence, reflective commentary and evidence-based appendices. Assessment should focus on reasoning, verification and professional judgement, not merely polished writing (UNESCO, 2023).

There are also institutional challenges. Some departments may lack access to software, reliable internet, sustainability databases and faculty training. Lecturers may feel unprepared to teach AI-enabled reporting if they have not received professional development in data analytics or sustainability standards. Institutions must therefore invest in faculty capacity, digital infrastructure and responsible AI policies. Where resources are limited, open-source tools, public corporate reports and carefully designed spreadsheet exercises can provide a realistic starting point.

Challenge	Risk	Mitigation strategy
Inaccurate AI output	Students may accept hallucinated or unsupported results.	Require source verification, citation checks and comparison with original reports.
Algorithmic bias	AI may classify or interpret ESG information unfairly.	Teach bias awareness, use multiple tools and require human judgement.
Data privacy	Students may upload confidential information to public platforms.	Use public data, anonymised datasets and institutional AI policies.
Academic misconduct	Students may submit AI-generated work as their own.	Require AI-use declaration, prompt log, oral defence and reflective reports.
Digital divide	Some students or institutions may lack access to tools.	Use open-source tools, shared laboratories and phased implementation.
Faculty readiness	Lecturers may lack AI or sustainability reporting competence.	Provide training, professional development and interdisciplinary collaboration.

9. DISCUSSION

The integration of AI into sustainability reporting education reflects a wider transformation in accounting. The profession now requires accountants who can combine reporting standards, data analytics, assurance reasoning and ethical judgement. AI-enabled pedagogy is therefore not a luxury; it is a response to the changing competence expectations of the profession (IFAC, 2025; IAASB, 2024).

The framework proposed in this paper emphasises that AI must be embedded within sound pedagogy. A weak assignment will not become effective simply because AI is introduced. The lecturer must define learning objectives, provide suitable datasets, guide students on standards, set ethical boundaries and assess the quality of professional reasoning. AI is most useful when it supports inquiry, evidence analysis and reflection rather than replacing student effort (Mishra & Koehler, 2006; UNESCO, 2023).

The Nigerian context makes the discussion particularly important. As sustainability disclosure expectations expand, universities and polytechnics need to prepare students for practice in an economy where companies will increasingly face sustainability reporting obligations. Accounting departments should therefore introduce sustainability reporting topics across financial accounting, auditing, management accounting, accounting information systems, corporate governance and research methodology courses (FRCN, 2024, 2026).

The discussion also highlights the need for interdisciplinary collaboration. Sustainability reporting requires knowledge of accounting, environmental management, governance, information systems, data analytics and ethics. AI-enabled teaching should therefore encourage collaboration among accounting lecturers, ICT specialists, environmental experts,

professional accountants and industry practitioners. This will make classroom activities closer to the interdisciplinary nature of actual sustainability reporting practice.

10. Implications for Accounting Education

10.1 Curriculum Implications

Accounting curricula should include sustainability reporting standards, climate-related disclosure, ESG metrics, assurance over sustainability information, AI-assisted data analysis and responsible technology use. These topics can be introduced as standalone courses or embedded across financial reporting, auditing, accounting information systems and corporate governance. Curriculum designers should align learning outcomes with professional expectations and current sustainability reporting developments (GRI, 2021; IAASB, 2024; IFAC, 2025; IFRS Foundation, 2023a, 2023b).

10.2 Implications for Lecturers

Lecturers need training in sustainability standards, AI tools, data analytics and digital pedagogy. Faculty development should focus on practical teaching design, responsible AI use, assessment redesign and current reporting developments. Lecturers should also learn how to evaluate AI-generated work and how to help students verify automated outputs.

10.3 Implications for Students

Students must develop a balanced competence profile. They should understand sustainability concepts, reporting standards and assurance expectations, while also gaining digital skills in text analysis, dashboards and AI-assisted research. Most importantly, they must learn that professional accountability remains with the accountant, not with the AI tool (IFAC, 2025; UNESCO, 2023).

10.4 Implications for Professional Bodies and Regulators

Professional accounting bodies and regulators should support curriculum modernisation through guidance, training, certification, teaching cases and collaboration with higher education institutions. As sustainability reporting and assurance standards evolve, professional bodies should help lecturers and students keep pace with global and national requirements (FRCN, 2024, 2026; IFAC, 2025).

11. Recommendations

- Accounting departments should introduce a compulsory sustainability reporting and disclosure module that includes AI-supported data analysis.

- Lecturers should design practical assignments using real annual reports, sustainability reports, assurance reports and public ESG datasets.
- Institutions should develop responsible AI policies that cover disclosure, verification, privacy, citation, prompt documentation and academic integrity.
- Professional bodies should provide continuing professional development on IFRS S1, IFRS S2, GRI Standards, sustainability assurance and AI tools for accounting educators.
- Students should be assessed through projects, oral defence, reflective writing and evidence-based reports rather than only written examinations.
- Universities should encourage collaboration between accounting departments, computer science departments, sustainability experts and industry practitioners.
- Future researchers should empirically test the proposed framework using student performance data, lecturer interviews, classroom experiments or institutional case studies.

12. Contribution of the Paper

This paper contributes to accounting education in three main ways. First, it connects sustainability reporting standards and professional education expectations with AI-enabled pedagogy. Second, it provides a conceptual framework that educators can adapt for classroom teaching, reporting laboratories and professional workshops. Third, it places responsible AI use at the centre of the model, thereby recognising that technological competence must be accompanied by verification, ethical judgement and accountability.

The paper also contributes to the Nigerian accounting education context by linking global sustainability reporting developments to the FRCN adoption roadmap and emerging local guidance. This makes the framework relevant not only for international discussions but also for universities, polytechnics, professional bodies and regulators seeking to strengthen sustainability reporting competence in Nigeria.

13. Areas for Future Research

- Future studies may test the proposed framework through classroom experiments comparing AI-enabled teaching with traditional lecture-based methods.
- Researchers may conduct surveys or interviews with accounting lecturers to examine readiness, training needs and barriers to AI integration.
- Institutional case studies may explore how universities and polytechnics in Nigeria are integrating sustainability reporting, assurance and AI into accounting curricula.

- Future research may also examine whether AI-supported assignments improve students' ability to detect greenwashing, apply reporting standards and exercise professional scepticism.
- Comparative studies across developed and developing economies may show how digital infrastructure, regulation and professional body support influence the teaching of sustainability reporting.

14. CONCLUSION

The teaching of sustainability reporting and disclosure in accounting education must respond to the combined pressures of global sustainability standards, national adoption roadmaps, stakeholder demand for credible ESG information and rapid digital transformation. Artificial intelligence offers important opportunities for improving how students learn sustainability reporting, particularly through data extraction, text analysis, standards mapping, dashboards, simulation and feedback.

However, the value of AI depends on responsible integration. AI should be used to strengthen, not replace, accounting judgement. Students must be trained to verify AI outputs, protect data, identify bias, understand standards and communicate conclusions transparently. The proposed framework provides a structured approach for linking reporting standards, sustainability data, AI tools, classroom activities and professional competence outcomes.

The paper concludes that AI-enabled sustainability reporting education can produce future-ready accounting graduates if institutions invest in curriculum redesign, faculty development, ethical safeguards and practical learning resources. Such an approach will help accounting education remain relevant in a world where sustainability disclosure, assurance and digital competence are becoming central to professional practice.

Declaration of Originality and Responsible AI Use

This manuscript is presented as a conceptual academic paper. Any use of AI-assisted drafting, editing or language support should be disclosed to the target journal in accordance with the journal's policy. The author remains responsible for the accuracy of citations, the integrity of arguments and compliance with academic and publication ethics.

Conflict of Interest Statement

The author declares no conflict of interest in relation to this manuscript.

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