Data Literacy in Accounting Education: Pedagogical Strategies, Analytics Tools and Global Standards Alignment

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ABSTRACT

Data literacy (DL) is a fundamental competency required in the accounting profession and a key pillar of datadriven professional decision-making. Professional accountants have the dual duty to understand complex datasets, utilise visual analytics effectively, and apply sound ethics and ethical reasoning to the data. International accrediting organisations, such as the Association to Advance Collegiate Schools of Business (AACSB) and the International Federation of Accountants (IFAC), have acknowledged the importance of DL via IES 2 (Technical Competence), IES 3 (Professional Skills), and IES 4 (Ethics and Values). This literature review presents a comprehensive review of the current evidence base, compiled from nineteen peer-reviewed studies published between 2015 and 2025, focusing on the relationship between DL and worldwide standards in accounting education. Informed by three key research questions, there is a focus on (i) the competencies and institutional support of teachers; (ii) the use of digital tools and curricula; and (iii) ethical, equity, and global strategies for the use of DL. Four themes emerge: educator empowerment, technology-based curriculum development, ethical and equity considerations, and global policy strategies. Findings indicate the need for comprehensive institutional support, instructor training, and tiered curricula that incorporate a range of instructional strategies, from basic tools (e.g., Excel) to more advanced techniques (e.g., analytics and scenario-based simulations). Ethical reasoning and transparency are integral to open-data projects, and global strategies should prioritise lowcost and scalable solutions to achieve equity in accessibility. Reform of the curriculum builds a strong foundation upon which to support AACSB and IFAC alignment. Future research should investigate the effects of DL on audit quality, fraud detection, and ethical reasoning in a quantitative manner. In combination, these insights provide guidance for training graduates with technical, ethical, and globally relevant skills in a data-driven profession.

Keywords: Data Literacy, Accounting Education, Digital Tools, Pedagogical Strategies, Professional Competencies

INTRODUCTION

The rapid development of technology and the availability of data have begun to impact the priorities of the accounting profession. While the profession once focused on data entry and compliance with regulations, accounting is now shifting its emphasis to data analysis, decision support, and business consulting. Accountants today have to analyse, synthesise and visualise large and complex data sets, and develop forecasts and recommendations regardless of whether the data is financial. Power BI, Excel, and other predictive analytical tools are becoming standard in many fields. The use of dashboards for recognising patterns is also ubiquitous.

While auditors act as the consumers of the data, management accountants produce it, using dashboards to model scenarios and manage performance operationally. They also use a risk management system to alter variables within a system. For this reason, the seamless, ethical and complex comprehension of data has been and remains the most crucial quality for accountants.

Data Literacy (DL) is no longer confined to data scientists or IT professionals. DL is a key competency for professionals in transformed, digitally integrated roles, including in accounting. However, DL is more than a collection of technical skills. It involves critical thinking, ethical reasoning, and the ability to engage effectively with people from diverse backgrounds. Such changes have also impacted the educational systems worldwide. DL is now considered a fundamental educational outcome by the Association to Advance Collegiate Schools of Business (AACSB) and the International Federation of Accountants (IFAC). For example, the AACSB, in its 2020 accreditation standards, requires the integration of technology and data analytics in the assurance of learning frameworks, and IFAC's International Education Standards IES 2, 3, and 4 document DL with a set of technical, professional, and ethical competencies. There is a clear case for incorporating DL education into accounting, but the issue of integrating DL into accounting education remains a significant and unresolved challenge internationally. In some accounting programs, DL is acknowledged on course syllabi, albeit colloquially, but DL is hardly integrated into the syllabi of core accounting courses. The lack of DL offerings is a reason why students often lack strong competencies in the effective use of data in various real-world accounting contexts. The lack of DL among students fuels the gap between students and the workforce in areas such as ESG reporting, cost analysis, fraud detection, forecasting, and performance management, among other skills that employers are seeking (Dow et al., 2021; Andiola et al., 2020).

Integration of DL in accounting education differs substantially at the regional level. The training continues to be inconsistent across Europe, with gaps in curriculum, pedagogy, and assessment. In a study of fifteen countries, it was noted to have performed only modestly in DL modules, but teaching IT separately was not an effective strategy (Leon-Urrutia et al., 2022). For the Global South, emphasis is set on equity and accessibility. In Africa and Latin America, educators utilise open data portals to address local challenges, such as climate change and public health, thereby promoting both technical and civic capacities (Kuhn et al., 2023). However, there are, in the African continent, significant barriers to the use of DL within universities (such as inadequate facilities and lack of staff development) in the continent (Enakrire, 2020). In Asia, DL efforts focus on employability. Students in Malaysia consider Excel and analytics necessary; however, faculty readiness is a challenge (Mahmud & Wong, 2022). Thailand and Indonesia trends suggest incremental learning, utilising Excel and analytics tools for more scaffolding (Jirakitpaibool et al., 2023; Ansyari et al., 2024). Hence, these gaps motivate a systematic inquiry, based on three objectives for research: on educators, technology, ethics, and globalisation in the integration of DL in accounting education. This study aims to answer the following questions relating to the study:

1. How do educators' competencies and institutional support influence the integration of DL in accounting education?
2. How do digital tools and curriculum design strategies drive the integration of DL in accounting education?
3. How do ethical principles and global strategies influence the integration of DL in accounting education?

Consequently, this study aims to address these questions and propose suggestions for the accounting curriculum, enabling graduates to possess sufficient competencies, particularly in analytics and ethics, to meet the requirements of the accounting profession in a digital world. This study presents the Methodology, Discussion, and Conclusion in the following sections.

METHODOLOGY

DL in higher education has gained interest in recent years. DL in higher education, and more specifically, DL in business and accounting, has sparked a perennial debate, prompting this study to examine the ways in which DL is taught and assessed within higher education institutions. In this instance, the SLR is intended to extract DL from educational business practices. In this case, the SLR is designed to be transparent and structured, thereby limiting and assessing biases.

The integration of DL within education, business, information science, and professional practices constitutes a further example of DL's interdisciplinary approach. SLR is also the appropriate approach when the DL interdisciplinary research framework is considered. Also, SLR is best positioned to answer the research questions, as it provides a comprehensive and contextualised account of the evidence available in a particular field. In line with this, Gough et al. (2017) and Petticrew and Roberts (2006) present a systematic approach to evidence synthesis within the field of education and the social sciences. Thanks to the model and the transparency

of PRISMA, this review successfully and transparently documented the collection, selection, and identification of pertinent studies (Moher et al., 2009). From the other end were the educational and business components found in high-quality, peer-reviewed publications that integrate both education and business. These components guide the systematic and purposeful utilisation of Scopus and Web of Science (WoS) (Falagas, 2008). Using the keywords "data literacy," "teaching methodology," "syllabus design," "curriculum development," and "higher education," as well as other related fields, a refined Boolean search was performed. The specific search targeted data literacy and education within the accounting and teaching design domains.

The search was conducted using the following keywords and Boolean operators:

(TITLE-ABS-KEY("data literacy" OR "data-driven learning" OR "data-informed teaching" OR "data competence" OR "data skills") AND TITLE-ABS-KEY(pedagogy OR pedagogical OR "teaching method*" OR "learning design" OR "curriculum design" OR "instructional design") AND TITLE-ABS-KEY("higher education" OR university OR "tertiary education" OR "college students" OR "undergraduate*" OR "accounting education" OR "finance education"))

The primary search returned 144 results. Inclusion requirements specified that studies needed to be peerreviewed, published, and available in full text in English, published between 2015 and 2025. Studies that discussed DL and/or pedagogical practices (and related practices) in higher education and business education, and were directly or closely related to accounting education, particularly in terms of analytics, ethics, or professional reasoning, were considered. Studies that were methodologically weak or in fields with no translational element were excluded. Of the studies that were qualified and available, 12 were selected and became the studies that were ultimately reviewed. To maintain meta-analytic rigour as much as possible, only studies that passed the critical review process of the six-criterion quality assessment framework (Petticrew & Roberts, 2006; Thomas et al., 2012) were included. The critical appraisal of the studies was determined based on the following aspects of the studies: (QA1) The aim of the study, (QA2) Importance of the study to teaching, practice, or policy, (QA3) Definitional clarity of the methodological framework, (QA4) Definitional clarity of the conceptual framework, (QA5) The study was empirical/ comparative, (QA6) Full disclosure or lack thereof, about the study's limitations.

Each of the criteria was rated on a three-point scale (1 = low, 2 = moderate, 3 = high), leading to a theoretical maximum total score of 18 for each study. The scores were adjusted to a six-point scale to provide for greater standardisation of the score. The average score for each study in this review ranged from 5.0 to 6.0, indicating that the studies were methodologically rigorous and highly relevant to DL in post-secondary education. The review of quality appraisals of studies at various quality levels is presented in Table 1, which summarises these studies (from the highest to the lowest grades) by six criteria.

Table 1. Quality Assessment of Reviewed Studies

#	Author(s)	QA1: Clarity	QA2: Usefulness	QA3: Methodology	QA4: Conceptual	QA5: Comparative	QA6: Limitations	Total Score (/6)
1	Bosman & Magana (2024)	3.0	3.0	3.0	3.0	3.0	3.0	**6.0**
2	Horng et al. (2024)	3.0	2.0	3.0	2.0	3.0	2.0	**5.5**
3	Méndez-Carbajo et al. (2019)	3.0	2.0	2.0	3.0	3.0	2.0	**5.5**
4	Ansyari et al. (2024)	3.0	2.0	3.0	2.0	2.0	2.0	**5.5**
5	Qiao et al. (2025)	3.0	3.0	3.0	2.0	2.0	2.0	**5.5**
6	Rafik & Misak (2025)	3.0	2.0	2.0	2.0	2.0	3.0	**5.0**
7	Al-Motrif (2025)	3	3	3	2	2	2	**5.5**
8	Cram et al. (2024)	3	3	3	2	2	2	**5.5**
9	Mahmud & Wong (2022)	3.0	2.0	2.0	2.0	2.0	2.0	**5.0**
10	Enakrire (2020)	3.0	2.0	2.0	2.0	2.0	2.0	**5.0**
11	Raffaghelli (2020)	3.0	2.0	2.0	3.0	2.0	2.0	**5.0**
12	Atenas et al. (2023)	3.0	2.0	2.0	3.0	2.0	2.0	**5.0**

13	Abou-El-Sood (2025)	3	3	2	2	2	2	**5**
14	Liu (2024)	3	2	2	2	2	2	**5**
15	Islam, Farah & Wang (2023)	3	3	2	2	2	2	**5**
16	Losi, Isaacson & Boyle (2022)	3	3	2	2	2	2	**5**
17	Aleqab, Nurunnabi & Adel (2015)	3	3	2	2	2	2	**5**
18	Chamizo-González et al. (2015)	3	2	2	2	2	2	**5**
19	Thompson & Irgens (2022)	2.0	2.0	2.0	2.0	1.0	2.0	**4.5**

RESULTS & DISCUSSION

The studies, although disparate in fields of interest such as business, education, and information science, align on competencies according to AASCB and IFAC standards. These are IES 2 on Technical Competence, IES 3 on Professional Skills, and IES 4 on Values and Ethics.

There was variation in methodological approaches, yet they all exhibited some level of methodological rigor. Recent quantitative studies (e.g., Qiao et al., 2025; Ansyari et al., 2024; Mahmud & Wong, 2022) utilized varied, but some measured, regression analyses and predictive models which measured instructional self-efficacy, professional readiness, and data-informed decision-making. Mixed-method studies (e.g., Bosman & Magana, 2024; Horng et al., 2024; Rafik & Misak, 2025) used surveys and incorporated qualitative interviews, reflections, or learning outcomes to provide deeper insights into DL development. Some qualitative and conceptual works (e.g., Raffaghelli, 2020; Atenas et al., 2023; Bocala & Boudet, 2015) critiqued the institutional, ethical and pedagogical frameworks, including social justice, open data, and reflective teaching practice, and the framing of pedagogy around social justice, open data, and reflective practice.

Analytically, a slice of the literature has demonstrated the use of tools and data practices relevant to the industry, including Power BI, Excel, economic datasets, and sustainability indicators. These are also relevant to accounting practice, including audit analytics, sustainability reporting, and data-driven budgeting; the tools and approaches have a high degree of portability. These analytical approaches are as much about enhancing the technical (IES 2) as they are about the professional (IES 3) and ethical judgement (IES 4) required.

Table 2 presents, in chronological order, a consolidation of the studies that illustrate the methodological diversity, analytical tools used, accounting relevance, and the degree of alignment with the competencies of AACSB and IFAC.

Table 2. Summary of Methodological Approaches, Analytical Relevance, and Competency Standards

#	Author(s)	Title (Short)	Method	Analytical / Numerical Relevance	Accounting Relevance	AACSB / IFAC Alignment
1	Abou-El-Sood, H (2025)	QuickBooks® in UAE Accounting Classes	Mixed methods	Mobile/cloud app use; comparative effectiveness	Financial accounting pedagogy	IES 2, IES 3
2	Al-Motrif, A (2025)	AI in Saudi Higher Education	Quantitative	Survey analytics; engagement/performance modelling	Technology enabled instruction & assessment	IES 2, IES 3
3	Qiao et al. (2025)	Teacher DDDM Scale	Quantitative	Scale validation, data ethics, self-efficacy modelling	Educator training, data-informed instruction	IES 3, IES 4

#	Author(s)	Title (Short)	Method	Analytical / Numerical Relevance	Accounting Relevance	AACSB / IFAC Alignment
4	Rafik & Misak (2025)	Data-Driven Learning in Armenia	Mixed methods	Assessment data, DL integration, student outcomes	Capstone evaluation, outcome-based education	IES 2, IES 3
5	Ansyari et al. (2024)	Determinants of Data Use	Quantitative	Predictive modelling, attitudes toward data use	Internal controls, audit instruction	IES 3
6	Bosman & Magana (2024)	Power BI & Entrepreneurial Mindset	Mixed methods	Power BI, dashboards, decision-making	Business analytics, dashboard reporting	IES 2, IES 3
7	Cram et al. (2024)	Blended in Finance course	Mixed methods / Designbased	Interactive online checks; iterative design	Foundational finance curriculum	IES 2, IES 3
8	Horng et al. (2024)	Big Data & Marketing Curriculum	Mixed methods	Big data projects, sustainability KPIs	ESG, integrated reporting, sustainability accounting	IES 2, IES 4
9	Liu, C (2024)	Automating Student Assessment	Quantitative	LMS data; automated performance assessment	Assessment efficiency & learning outcomes	IES 2, IES 3
10	Atenas et al. (2023)	Critical Data Literacy in Practice	Qualitative	Open data, critical pedagogy, equity-oriented design	CSR, ethics in data use	IES 4
11	Islam et al. (2023)	Accounting Data Analytics in R: A Case Study Using Tidyverse	Teaching case	R/tidyverse for audit/analytics	Auditing/analytics courses	IES 2, IES 3
12	Losi et al. (2022)	Faculty Views on Data Analytics	Quantitative	Curriculum gap analysis	Accounting curriculum planning	IES 2, IES 3
13	Mahmud & Wong (2022)	21st Century Skills in Undergrad	Quantitative	Excel analytics, student perceptions, digital readiness	Employability, business school integration	IES 2, IES 3
14	Thompson & Irgens (2022)	Data Detectives (K–12)	Qualitative	R programming, earlystage DL, scaffolded inquiry	Curriculum design inspiration	IES 2, IES 3
15	Raffaghelli (2020)	Data Literacy & Social Justice	Conceptual	Data ethics, governance, transparency	Ethics, accountability, social responsibility	IES 4
16	Enakrire (2020)	Data Literacy in African HEIs	Qualitative	Educator capacity, infrastructure, institutional practices	Curriculum development in Global South contexts	IES 2, IES 3, IES 4
17	Méndez-Carbajo et al. (2019)	Numeracy & Economic Data	Conceptual + Data	Economic data sets, ratio analysis, financial numeracy	Financial reporting, economic analysis	IES 2
18	Aleqab et al. (2015)	AIS Curriculum & IFAC Compliance	Mixed methods	Mapping curricula to IFAC requirements	AIS course design; standards compliance	IES 2, IES 3
19	Chamizo-Gonzalez et al. (2015)	Educational Data Mining in Accounting	Quantitative	VLE activity logs; datamining analytics	Teaching guide adjustments	IES 2, IES 3

Thematic Synthesis of Findings

This review aimed to examine how DL is conceptualised, implemented, and aligned with international accreditation standards in accounting education. Guided by three research questions (RQs), the analysis

integrated peer-reviewed studies and discourse synthesis for the nineteen studies on the topic, selected for methodological rigour and relevance. This discussion revolves around clustering into categories, weaving each RQ with the relevant dominant themes within the literature.

RQ1: How do educators' competencies and institutional support influence the integration of DL in accounting education?

Educator Competencies and Institutional Support

The incorporation of DL in accounting education is inextricably linked to the capacities and dispositions of the instructors. The findings from the studies reveal that pedagogical training and professional philosophy are frequently more important than technical skill in educational practice. Qiao et al. (2025) introduced an empirically validated scale to investigate the confidence of teachers regarding the ethics of data use and the quality of their practices while integrating lessons into DL teaching practices, across a range of dimensions related to ethical decision making, integrating lessons, and DL in instruction. Similarly, Ansyari et al. (2024) extended this notion by applying machine learning models to predict the effectiveness of DL with data-informed teaching beliefs and predictive pedagogical strategies.

Another key factor is the structural barriers. Enakrire (2020) also noted systemic barriers that exist at African universities, such as inadequate infrastructure, poor faculty training, and the absence of institutional strategies. Results highlight the importance of effective support of professional development, workload models, and advocacy. Nonetheless, studies by Al Motrif (2025) and Losi et al. (2022) highlight faculty preparedness/institutional support as key drivers of DL adoption, while Aleqab et al. (2015) concentrate on IFAC compliance and resource constraints.

Building on these insights, this paper describes DL not as a technical capability, but as a way of seeing that enables ethical and informed professional decisions and applications in accounting education. It follows that, where DL integration is technical modernisation, it is also a strategic shift, a development that should combine with IES 3 (professional skills)—communication, reflective practice and continuous learning in a professional context, as well as IES 4 (ethical values), in that all will be tied up with responsible data use to facilitate their use. This is why a good baseline for embedding DL into accounting programs is to support educator preparedness with the assistance of the institution's initiative

RQ2: How do digital tools and curriculum design strategies drive the integration of DL in accounting education?

Digital Tools and Curriculum Design

Research and discussion clearly indicate that embedding empirical, real-life data tools in accounting education correlates with higher DL. This hands-on, tool-driven learning can also lead to the technical skills and analytical thinking necessary for practice. Bosman and Magana (2024) integrate Microsoft Power BI into an entrepreneurship learning module to engage learners in a “real-time” model supported by dashboards, analytics frameworks, and other tools, allowing students to simulate real-time decision-making. More importantly, these tools promote DL and advance expertise in management accounting, forecasting and performance analysis, which are components of IES 2 (technical competence).

Similarly, Horng et al. (2024) developed a curriculum incorporating big data and sustainability KPIs, aiming to enhance the strategic aspects of ESG reporting and analytical skills. There is also a marketing-oriented approach, but it is easily applicable to accounting areas such as sustainability reporting and integrated performance measurement, making it a versatile approach that can be integrated into various accounting disciplines. MéndezCarbajo et al. (2019) also illustrate some of this value added through the provision of economic datasets and ratio analyses in undergraduate education, generating the numeracy and interpretation needed for finance and auditing. These tasks replicate actual professional work and rely on standard solutions (Excel and visualisation dashboards) used outside of academia.

The evidence from Abou-El-Sood (2025), Islam et al. (2023), and Cram et al. (2024) confirms this theme. As such, Abou-El-Sood (2025) shows how QuickBooks, a mobile/cloud platform, bolsters engagement and authentic evaluation. Meanwhile, Islam et al. (2023) introduce R/tidyverse in the field of audit analytics to merge coding literacy with accounting applications. In furtherance of these strategies, Cram et al. (2024) show us how design-based blended finance courses utilise curriculum scaffolding and iterative improvements for large student cohorts. In short, these trends align with the general interest in incorporating analytics tools across audit, taxation, and reporting modules, and include ethics elements within the curriculum for greater congruence with the AACSB's focus on agile technology and assurance of learning. These practices fill the void in students' learning before they enter the job market, allowing DL to be part of the current accounting learning process.

RQ3: How do ethical principles and global strategies influence the integration of DL in accounting education?

Ethical and Equity Dimensions in DL

The literature highlights the notion that DL, as a competence, transcends technical know-how to encompass the realms of ethics and citizenship. DL moves toward utilitarian competencies and critical citizenship, as well as the right to the city. Most DL initiatives, as Raffaghelli (2020) notes in a thorough review, do not explicitly mention social justice. However, they do focus on the issues of transparency, accountability, and ethics in the use of data, which aligns with the principles of IES 4. Some of the literature also addresses the sustainability concern, which highlights ethics as a critical dimension of accounting.

Through the lens of open data and critical DL pedagogy, Atenas et al. (2023) correlate civic-oriented pedagogy with the DL pedagogy and promote the critical engagement of students with issues of injustice, corruption and sustainability. In that case, students acquire both analytical and ethical skills, as well as citizenship training skills, that are necessary for auditing, governance, and compliance. Likewise, Thompson and Irgens (2022) also describe how embedding DL pedagogy early teaches us habits of ethical enquiry and curiosity—abilities that translate to higher education settings, including fraud detection and ethical audits.

Global and Regional Strategies for DL Integration

The global scale of DL integration emphasises the need to adapt strategies due to context. Rafik and Misak (2025) report on Armenian higher education and discuss how DL interventions resulted in student achievement, but at the same time, resulted from low faculty and infrastructure resources. Similar trends were observed in Malaysia, where Mahmud and Wong (2022) stated that students considered DL as one of the keys to employability, but academic institutions lack the necessary resources and training. Enakrire (2020) and Atenas et al. (2023) advocate for low-cost, open solutions, such as open educational resources, collaborative teaching, and cross-institutional partnerships, to bridge these divides. These approaches are compatible with AACSB's global learning standards, which prioritise equity, access and social responsibility. Together, these findings confirm that ethical and global dimensions are not tangential but are critical to the implementation of DL.

Consequently, accounting education needs to integrate a general DL framework that provides additional technical skills, while also providing an academic grounding in ethics and global perspectives, with an emphasis on accountability to both the profession and society.

Summary of Alignment

The focus of the 4 main themes of the existing literature review (1) the importance of educator skills and institutional backing, (2) digital resources and design of the curriculum, (3) the role of ethics and equity, and (4) global strategy, which are mapped exactly in line with the three research questions. Each of the themes demonstrates one of the many facets of DL implementation and is consistent with IES 2, 3, and 4, as well as AACSB's Assurance of Learning framework. These benchmarks provide an organised model that can be easily tailored by academic institutions for embedding DL in accounting training in a holistic, contextually sensitive and globally applicable manner. Table 3 aligns each RQ (RQ1 to RQ3) with the themes found in the literature and their congruence with IFAC International Education Standards (IES 2, IES 3 and IES 4) and AACSB learning outcomes.

Table 3. Mapping Research Questions to Themes, Supporting Studies, and Focus Areas on DL Integration for Accounting Education

Research Question	Corresponding Theme(s)	Supporting Studies	Focus
RQ1. How do educators' competencies and institutional support influence the integration of DL in accounting education?	Educator Competencies and Institutional Support	Al-Motrif (2025); Qiao et al. (2025); Ansyari et al. (2024); Losi et al. (2022): Aleqab et al. (2015): Enakrire (2020): Bocala & Boudet (2015)	Faculty readiness, reflective pedagogy, and institutional support (IES 3 & IES 4)
RQ2. How do digital tools and curriculum design strategies drive the integration of DL in accounting education?	Digital Tools and Curriculum Design	Bosman & Magana (2024); Horng et al. (2024); Abou-El-Sood (2025), Cram et al. (2024); Islam et al. (2023), Méndez-Carbajo et al. (2019)	Practical tools (Excel, Power BI), curriculum scaffolding, authentic assessment (IES 2)
RQ3. How do ethical principles and global strategies influence the integration of DL in accounting education?	Ethical and Equity Dimensions in DL Global and Regional Strategies for DL Integration	Raffaghelli (2020); Atenas et al. (2023); Thompson & Irgens (2022) Rafik & Misak (2025); Mahmud & Wong (2022); Enakrire (2020); Atenas et al. (2023)	Ethical reasoning, equity, open data, and regional strategies (IES 4, AACSB ethics outcomes)

IMPLICATIONS & RECOMMENDATIONS

The themes in this review highlight the importance of factors related to teaching in accounting education. First, concerning RQ1 (Educator Competencies and Institutional Support), teaching faculty show the importance of all pedagogical development factors for the successful integration of DL. Whereas some level of development (or reflection) is required to have an impact, DL must be present in the course load and promoted. Therefore, the importance of efforts directed to teaching ethics, design, and student-centred pedagogy should be built into the course load and promotion criteria framework.

Second, as per RQ2 (Digital Tools and Curriculum Design), DL should permeate all layers of accounting curricula, not only a few courses. A scaffolded approach is recommended with the teaching of DL, starting with the basics, i.e. Excel and ratios analysis, and moving to more sophisticated data visualisation, dashboards, KPIs, and other scenario-based simulations. These simulations and other real-world activities parallel the profession in management reporting, ESG, and audit planning, enhancing technical and work-readiness.

Third, in connection with RQ3 (Ethical and Equity Dimensions), ethics must be strengthened as a primary focus when integrating DL and data literacy. Integrative data literacy (DL) involves more than just the collection and manipulation of technical data; it also encompasses accountability, transparency, and the responsible use of data. The teaching of ethical reasoning and bias recognition within auditing, governance, and ethics, along with data set teaching and open-data case teaching, fosters the IES 4 and AACSB professional judgment competencies.

Ultimately, the cross-cutting implications enhance global compliance and accreditation standards. The DL competencies should comply with the IFAC's International Education Standards (IES 2, IES 3, IES 4) and the AACSB standards for assurance of learning outcomes to ensure the integration of all curriculum levels. In resource-poor contexts, the digital divide, caused by the unequal distribution of resources, is best addressed through equity-centred methodologies, such as the use of open-source tools, collaborative teaching, and the sharing of resources. The conceptual model for DL in accounting education is presented in Figure 1.

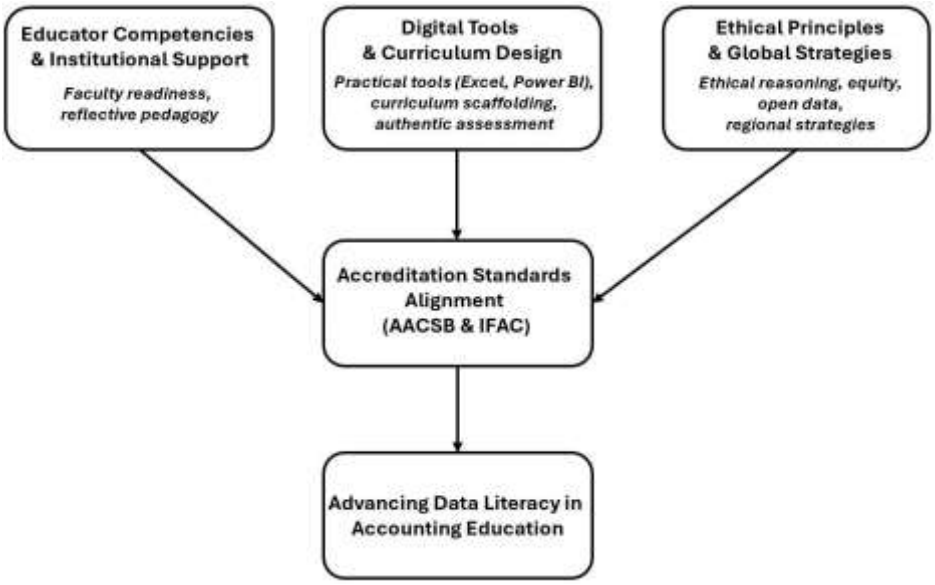

Figure 1: Data Literacy Implementation Model for Accounting Education

CONCLUSION

This review was based on three research questions that investigated the conceptualisation, implementation, and incorporation of DL in accounting education. Findings from RQ1 demonstrate the importance of educator competencies and institutional support. Indeed, teacher development, reflective pedagogy, and an ethically aware teaching practice are prioritised above technical ability, emphasising the need to formalise training and campus affirmation of DL. RQ2 further states that content should include DL across accounting models by embedding it in accounting curricula over time, rather than in isolated courses. Scaffolded learning – beginning with basic tools like Excel and ratio analysis and moving to analytics platforms like Power BI and R – allows for real, realworld work experience that develops technical competence and readiness for the real world.

In addressing RQ3, the review emphasises the notion that DL is inextricably linked to ethical principles and global strategies. Integrating transparency, accountability, and the responsible use of data into audit, governance, and ethics modules, along with open-data case studies, can help build professional judgment related to IES 4 and AACSB standards. Equity-based methods, such as open-source tools and collaborative teaching, are necessary in low-resource contexts to promote equitable use, ensuring the implementation is inclusive of all users. In general, DL is a multidimensional competency which includes technical, professional and ethical aspects.

Its incorporation needs to be compatible with IFAC's International Education Standards and AACSB assurance of learning outcomes. Barriers include a small number of accounting-based DL studies and language bias. Longitudinal and comparative designs should be utilised in future research to quantify the effect of DL on audit quality, fraud detection, and ethical reasoning. Integrating DL holistically will help to prepare graduates to become ethical and analytical individuals who will succeed in a data-driven global economy.

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Conflict Of Interest Statement

There is no conflict of interest regarding the publication of this research

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