



Artificial Intelligence in Accounting Pedagogy and SDG Alignment: A Global Bibliometric Analysis

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Abstract

Despite this interest in artificial intelligence-based accounting pedagogy, the extent to which African scholarship contributes to the field and aligns with sustainable development priorities remains underexplored. This study fills this gap by applying a PRISMA-guided bibliometric analysis alongside an assessment of alignment with the Sustainable Development Goals. Data were drawn from the Scopus and Web of Science databases, yielding a final sample of 148 publications released between 1986 and 2026. Bibliometric techniques, including performance analysis, Bradford's Law, Lotka's Law, co-authorship mapping, thematic analysis and conceptual structure mapping, were employed using the Bibliometrix R package. The findings point to a fast-growing research area with an annual growth rate of 5.34%, in which publication output has risen sharply since 2022, following the emergence of generative AI technologies. Research productivity and citation impact remain heavily concentrated in developed economies, particularly the United States, Australia and the United Kingdom, while African contributions are comparatively limited and largely driven by South Africa. Thematic analysis identifies artificial intelligence, accounting education, data analytics, skills development and higher education as dominant research clusters. Furthermore, the study from African researchers demonstrates substantial implicit alignment with SDG 4 and SDG 9. However, explicit integration of SDG frameworks within the literature remains limited. The study concludes that although African scholarship is contributing meaningfully to AI-driven educational innovation, greater investment in research capacity, digital infrastructure, international collaboration, and SDG-oriented scholarship is required to strengthen the continent's influence in the global accounting education discourse and to support sustainable education.

Keywords: Accounting Education, Accounting Pedagogy, Artificial Intelligence, SDG 4, SDG 9

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INTRODUCTION

Artificial Intelligence (AI) is widely regarded as a major driver of rapid development across various fields of education, including accounting. It is transforming higher education globally, changing the narrative not only in computing and administrative systems but also pedagogical design, curriculum structure, and assessment practices (Vieriu & Petrea, 2025). Looking into accounting pedagogy, one will acknowledge the specific role of AI tools, ranging from machine learning applications to intelligent tutoring systems and generative AI platforms, in learning, professional practice, and the development of digital competencies.

Alassuli et al. (2025) and Vieriu and Petrea (2025) held that globally, accounting pedagogy is undergoing digital transformation in response to automation in auditing, financial analytics, and enterprise systems. Since professional accounting bodies are placing growing emphasis on data analytics and AI literacy as essential competencies, educational institutions are being pushed to incorporate AI-related skills into their accounting programs. This shift is consistent with the wider reshaping of the accounting profession, in which algorithmic decision-making and predictive analytics are increasingly becoming standard practice.

Integrating AI into accounting education comes with its own set of difficulties. On a global scale, the level of AI integration in accounting education varies across continents (Silva et al., 2025; Mpofu & Swart, 2024). While institutions in North America, Europe, and parts of Asia have begun embedding AI-driven tools into teaching and learning ecosystems, the African higher education landscape presents a more complex picture. This variation in the level of AI adoption in the teaching and learning of accounting globally can be seen in issues of digital infrastructure, funding disparities, institutional capacity, research and development, and ethical considerations (Mpofu & Swart, 2024; Adewale et al., 2024; Alruwaili & Mgamal, 2025). Despite these, Universities across the African continent still produce digitally competent graduates capable of participating in a rapidly evolving global accounting landscape. However, this tension between AI adoption and systemic constraint makes Africa a uniquely important site for examining AI-driven pedagogical transformation.

Unlike the African narrative, the United Nations Sustainable Development Goals (SDGs) initiative has positioned digital transformation and educational quality as key pillars of sustainable growth (Ufua, et al., 2021; UNCTAD, 2023; Kumar & Shah, 2025). There are two specific SDGs relevant to

integrating AI into accounting pedagogy in Africa. The first is SDG 4, which concerns quality education. It highlights inclusive, equitable, and quality tertiary education, along with the development of technical and vocational skills required for employment and entrepreneurship. AI-enabled pedagogical tools have the potential to personalise learning, improve student performance analytics, and strengthen digital accounting competencies, thereby contributing to SDG 4 targets relating to skills development and equitable access (AlSagri & Sohail, 2024; Alkhawaja et al., 2025). The second is SDG 9, which concerns Industry, Innovation and Infrastructure. It underscores the importance of strengthening scientific research, enhancing technological capacity, and fostering innovation ecosystems. The integration of AI into accounting pedagogy aligns directly with SDG 9 through institutional innovation, digital infrastructure development, and the cultivation of research capacity in emerging technologies. For African universities, AI adoption is not merely a pedagogical issue; it is an innovation and capacity-building challenge that intersects with broader developmental objectives.

Despite these clear linkages, there is little scholarship that frames AI in accounting pedagogy within sustainable development discourse. Many studies, such as Mpofu and Swart (2024), Adewale et al. (2024), Charles and Charles (2024), Alruwaili and Mgammal (2025), Vieriu and Petrea (2025), and Campillo-Ferrer et al. (2025), however, focus on technological adoption, tool effectiveness, or student perceptions, without situating their findings within broader questions of innovation capacity, infrastructure readiness, equity, or skills transformation. Consequently, there is limited understanding of whether the emerging body of research meaningfully aligns with the priorities of SDG 4 and SDG 9. Furthermore, the acceleration of generative AI technologies since 2022 has intensified pedagogical disruption. Issues such as academic integrity, automated assessment, curriculum redesign, and digital ethics have become central to debates in accounting education (Xia et al., 2024; Xiaoyu et al., 2025; Bittle & El-Gayar, 2025; Giannakos et al., 2025; Al-Hajaya, 2026). Yet it remains unclear how African scholarship is responding to this shift.

To fill these gaps, this study undertakes a PRISMA-guided bibliometric as well as an SDG alignment analysis of research on Artificial Intelligence in accounting pedagogy within Africa. By systematically identifying, screening, and analysing scholarly publications from 1986 to 2026, and then aligning the outputs with the SDGs since the SDGs officially came into force on January 1, 2016, this study maps the intellectual structure, thematic evolution, and collaboration patterns shaping this field. Beyond standard bibliometric mapping, the study adds an SDG alignment lens to assess how existing research

contributes to SDG 4 (Quality Education) and SDG 9 (Industry, Innovation and Infrastructure). Considering the above, the research questions are:

RQ1: What are the intellectual structures, publication trends, and collaboration networks underpinning research on AI in accounting pedagogy?

RQ2: What thematic clusters characterise this domain?

RQ3: How does existing scholarship align with SDG 4 and SDG 9 targets, and where do significant gaps remain?

RQ4: How does existing scholarship align with SDG 4 and SDG 9 targets, and where do significant gaps remain

By providing evidence-based answers to these questions, this research contributes to the body of knowledge by providing an Africa-cantered synthesis of AI scholarship in accounting education, offering clarity on productivity patterns, thematic development and institutional influence. It further advances methodological innovation by embedding sustainable development alignment within bibliometric review design. Additionally, it generates policy-relevant insights for universities, regulators, and governments seeking to strategically position accounting education within Africa's digital transformation agenda.

MATERIAL AND METHOD

Research Design

This study employed both quantitative mapping and qualitative developmental evaluation. A bibliometric review design guided by PRISMA was employed to systematically investigate research on Artificial Intelligence (AI) in accounting pedagogy within the African context, incorporating a structured Sustainable Development Goal (SDG) alignment analysis that assesses how the literature contributes, explicitly or implicitly, to SDG 4 (Quality Education) and SDG 9 (Industry, Innovation and Infrastructure) as set out by the United Nations. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework offers a transparent and reproducible process for identifying, screening, and selecting relevant literature (Kukreja, 2025; Rethlefsen et al., 2021).

Bibliometric methods were used to chart the intellectual structure, thematic development, and collaboration networks within the field.

Data Sources

A systematic search was carried out in both the Scopus and Web of Science Core Collection databases. These databases were chosen because they offer extensive coverage of peer-reviewed journals in accounting, education, and information systems, and because they work well with bibliometric software. The search covered the period from 1986 through February 2026.

The Boolean search string "artificial intelligence" OR "AI" OR "machine learning" OR "deep learning" OR "intelligent tutoring systems" OR "adaptive learning" OR "generative AI" OR "ChatGPT" AND "accounting education" OR "accounting pedagogy" OR "accounting instruction" OR "accounting curriculum" OR "teaching accounting" AND "Africa" OR "Sub-Saharan Africa" OR "South Africa" OR "Nigeria" OR "Kenya" OR "Ghana" OR "Uganda" OR "Tanzania" was built around three main concepts and was run on February 28, 2026. The initial search returned articles published between 1986 and 2026, yielding a total of 216 documents. After the documents were screened, however, 148 articles remained and were confirmed clean for the analysis.

- i. Artificial Intelligence
- ii. Accounting pedagogy
- iii. African geographical layout

The review followed the four-stage data collection and analysis process as prescribed by PRISMA, as shown in Fig 1:

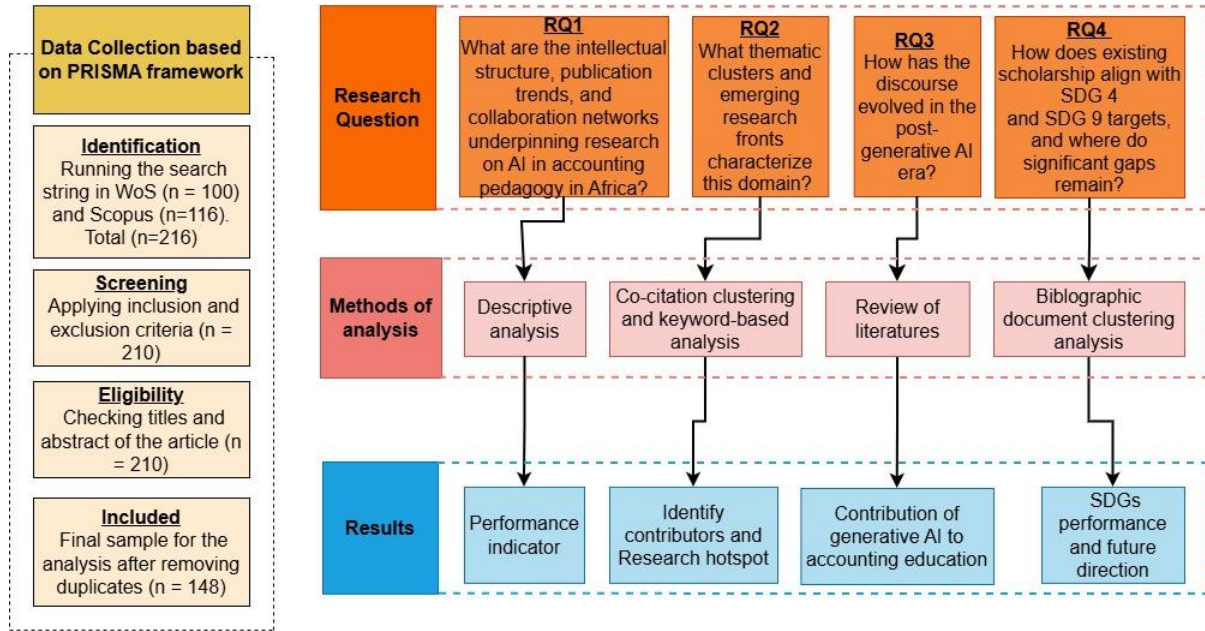


Figure 1: Research Design (PRISMA Guideline)

Data Analysis

Four principal bibliometric analysis methods were adopted for this research as advocated by Hoang and Hoang (2025). Descriptive analysis was applied to examine publication trends, contributing countries, affiliations, authors, citation impact, and journals. Network visualisation was used to determine authorship, institution, and country levels. The researcher further used co-citation mapping to identify foundational intellectual influences and knowledge clusters shaping AI-driven accounting pedagogy research. Thematic analysis was used to evaluate shifts in discourse following the arrival of generative AI tools in 2022. Additionally, Bradford's Law, Lotka's Law, the MCA conceptual structure, and an author collaboration network analysis were conducted. To address the sustainability dimension of the study, a structured SDG alignment framework that identifies the two SDGs under review was formulated.

Bibliometrix maps were generated with the help of the Bibliometrix R package. Using data obtained from WoS and Scopus, maps of journals, countries, key research areas, and keywords were produced from correlation data.

RESULTS

Descriptive Overview

This study offers a quantitative synthesis of the intellectual landscape surrounding Artificial Intelligence (AI) in accounting pedagogy, placing particular emphasis on its relevance to Africa and its alignment with the Sustainable Development Goals (SDGs). The bibliometric dataset covers the period from 1986 to 2026, comprising 148 documents drawn from the Scopus and Web of Science databases across 92 sources, with contributions from 744 authors. With an annual growth rate of 5.34%, the field has an average document age of 5.24 years and a mean of 10.74 citations per document, indicating a moderate level of scholarly impact. These indicators imply that research on AI in accounting education is relatively new yet steadily growing, consistent with wider trends in digital transformation and educational innovation, and suggest that although the field is gaining recognition, it has not yet reached the citation density characteristic of more established disciplines (Sampaio & Silva, 2025; Abdulwahid & Faozi, 2024; Zawacki-Richter et al., 2019). The moderate scale of the dataset further confirms that this domain—especially in the African context—remains underdeveloped and emergent, which justifies the call for additional regionally grounded empirical and conceptual studies.

An analysis of the authorship patterns reveals 744 contributors in total, with 33 publications authored by a single author, pointing to a robust culture of collaborative research in the field. The mean of 5.45 co-authors per document further highlights the interdisciplinary, team-oriented character of research on AI and accounting pedagogy. However, the international co-authorship rate of 14.86% is relatively low when compared with the global benchmarks in technology-driven research fields. This may be due to several factors, including limited cross-border collaboration, poor funding, inadequate institutional capacity, and limited network accessibility. Furthermore, the presence of 526 author keywords reflects a high degree of thematic diversity, suggesting that the field is conceptually fragmented and rich in intellectual exploration.

The findings of this research indicate that Africa occupies a comparatively marginal position in the global research landscape regarding Artificial Intelligence (AI) and accounting pedagogy. Although the bibliometric analysis demonstrates growing international interest in AI-enabled accounting education, African contributions remain limited in terms of publication output, citation impact, and participation in international research collaborations. South Africa emerges as the continent's most visible

contributor, while many African countries remain absent from the global knowledge network. This trend aligns with broader evidence suggesting that research production in emerging technological fields is disproportionately concentrated in developed economies with stronger research infrastructure and innovation systems.

Even though its research output is comparatively limited, African literature shows a notable correspondence with the aims of Sustainable Development Goal 4 (Quality Education). The reviewed studies predominantly focus on improving educational quality through curriculum reform, competency development, critical thinking, adaptive learning, metacognition, and student-centred pedagogical approaches. For example, studies examining learning strategies among accounting students, decision-making skills, competency-based education, and reflective learning approaches highlight efforts to enhance learning outcomes and educational effectiveness. Similarly, research on AI adoption, technological proficiency, and ChatGPT utilisation in accounting education reflects a growing commitment to equipping students with future-oriented skills for digitally transformed workplaces. These themes resonate strongly with SDG 4, which emphasises inclusive, equitable, quality education and the cultivation of relevant skills for employment and lifelong learning.

The findings also indicate substantial alignment with SDG 9 (Industry, Innovation, and Infrastructure). Several studies in the African dataset focus on technological innovation, AI adoption, digital competencies, and the integration of emerging technologies into accounting education. Research on the AI revolution in accounting, technological proficiency, digital learning tools, and AI-driven educational transformation demonstrates growing recognition of innovation as a critical driver of educational and professional development. These studies underscore the importance of developing technologically competent accounting graduates who can operate effectively in increasingly automated, data-driven business environments. Such efforts contribute directly to SDG 9 by promoting innovation, strengthening technological capabilities, and supporting the development of sustainable infrastructure for knowledge creation and dissemination.

However, an important finding from the analysis is that the identified African studies rarely explicitly reference the SDGs, despite their clear relevance to sustainable development objectives. The SDG alignment assessment revealed that most publications were classified as having no direct SDG linkage, suggesting that researchers often address educational quality and technological innovation without

explicitly situating their work within sustainability frameworks. This represents a missed opportunity to strengthen the policy relevance and international visibility of African scholarship. Explicit integration of SDG perspectives could enhance the contribution of accounting education research to global debates on sustainable development, digital transformation, and educational innovation.

The limited visibility of African scholarship also raises concerns regarding the continent's ability to influence the future direction of AI-enabled accounting education. The bibliometric results show that countries such as the United States, Australia, and the United Kingdom continue to lead in both scientific output and citation impact, whereas African contributions remain relatively small. This imbalance may result in the adoption of educational models and technological solutions that do not fully reflect African realities, including infrastructural limitations, digital inequality, resource constraints, and diverse educational contexts. As a result, more investment is needed in research capacity, digital infrastructure, and international collaboration to boost Africa's involvement in the global conversation on AI and accounting education.

Overall, the evidence suggests that African research is already contributing meaningfully to the advancement of SDG 4 and SDG 9 through its focus on educational quality, technological innovation, and competency development. Nevertheless, stronger research capacity, increased scholarly visibility, and explicit incorporation of SDG frameworks are necessary to ensure that Africa plays a more prominent role in shaping the future of AI-enabled accounting education and sustainable development.

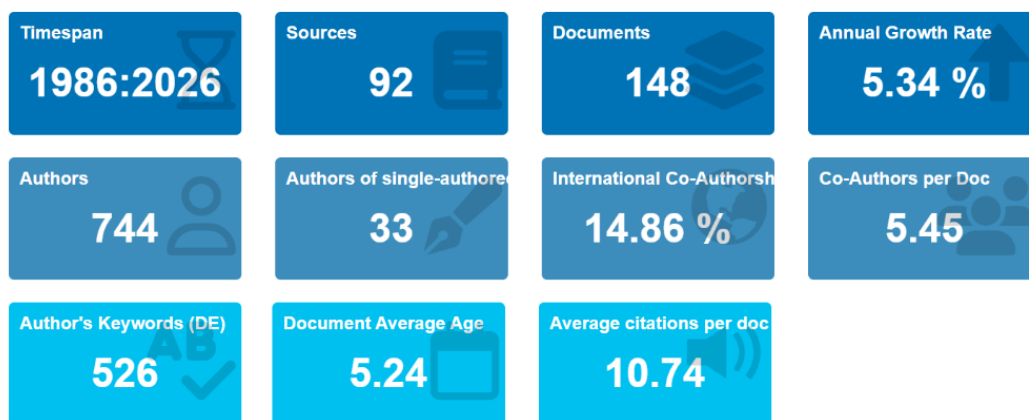


Figure 2: Descriptive Overview

Annual Scientific Production and Evolutionary Trends

Figure 3 shows the yearly distribution of publications on Artificial Intelligence (AI) in accounting pedagogy between 1986 and 2026, revealing a growth trajectory that is highly uneven yet increasingly accelerating.

Early Stage (1986–2005)

The period between 1986 and the early 2000s witnessed sporadic scholarly output, with most years recording either zero or one publication. This phase reflects the nascent stage of AI adoption in education, where technological limitations and low computational capacity constrained practical applications. In the context of accounting pedagogy, this period likely focused on basic computer-assisted learning and expert systems, rather than advanced AI integration. The absence of sustained publication activity indicates that the field had not yet developed into a coherent research domain. (Ali, 2024; Ben Ahmed, 2026).

Formative Growth Stage (2006–2015)

Publication output rose gradually from 2006 to 2015, with yearly contributions increasing slightly by 1 to 3 articles. Although growth remained slow, the consistency of output suggests the beginning of scholarly recognition and domain formation. This aligns with broader trends in educational technology research, in which digital learning innovations have begun to gain traction globally (Abdullah, 2024; Lin & Chen, 2024).

Acceleration Stage (2016–2021)

There was a significant increase in publication output between 2016 and 2021, as the field entered a clear acceleration phase, with annual publications rising to 2-4 articles, followed by a noticeable uptick toward the end of 2021. The upward trend during this period reflects a transition from exploratory research to applied and pedagogical innovation, particularly in integrating AI tools into teaching and curriculum design (Ng & Ho, 2025; Prayuda et al., 2026; Salido et al., 2025).

Exponential Expansion Phase (2022–2026)

The most striking feature of Figure 3 is the sharp surge in publications between 2022 and 2026, culminating in a peak of 51 articles in 2025 and 8 outputs in the first 2 months of 2026, preceded by

22 publications in 2024. This represents a near-rapid growth pattern, significantly exceeding outputs in previous decades. This phase reflects what may be described as a paradigm shift, where AI is no longer peripheral but central to pedagogical innovation. Comparable patterns of rapid growth have been documented across AI-related educational research more generally (Zawacki-Richter et al., 2019).

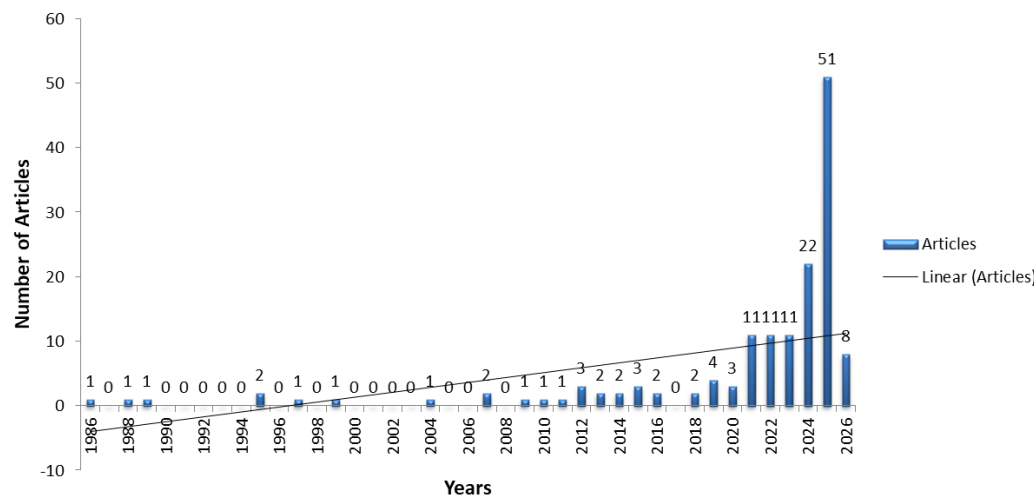


Figure 3: Publication Trend

Source Analysis: Core Journals and Knowledge Dissemination Structure

Figure 4 shows how publications are distributed among the most prominent journals in Artificial Intelligence (AI) in accounting pedagogy. The results reveal a moderately concentrated yet still evolving publication structure, with a few leading outlets and a long tail of contributing journals. The figure identifies Accounting Education as the leading source, with 14 publications in the dataset, trailed by Issues in Accounting Education at 9 publications, while Journal of Accounting Education and Journal of Emerging Technologies in Accounting each have 8 publication outputs. Together, these journals constitute the field's core knowledge base, suggesting that research on AI in accounting pedagogy is mainly grounded in discipline-specific educational and professional accounting outlets.

The concentration suggests that the field maintains a strong disciplinary identity, which means that pedagogical innovation in accounting is shaped internally within the profession rather than externally. This is consistent with bibliometric findings indicating that new educational technologies tend to become established first in field-specific journals before spreading to wider interdisciplinary publications (Khaddar et al., 2025; Prayuda et al., 2026). Nevertheless, outside the core journals, Higher Education Skills and Work-Based Learning (with 4 publications), Applied Mathematics and

Nonlinear Sciences (with 3 publications), Cogent Education (with 3 publications), and International Journal of Management Education (with 3 publications) were all recognised as middle-tier contributors, thus pointing to the interdisciplinary diffusion of AI in accounting pedagogy. This diffusion reflects the multi-dimensional nature of AI adoption, which requires integration of technological, pedagogical, and domain-specific knowledge (Singh & Strzelecki, 2026; Ali et al., 2024). Moreover, the long-tail distribution in Figure 4 reinforces the position taken by Dai et al. (2025) and Fährndrich (2023), since it is marked by emerging and interdisciplinary research domains in which knowledge production is spread across a broad array of outlets rather than concentrated in a few dominant journals.

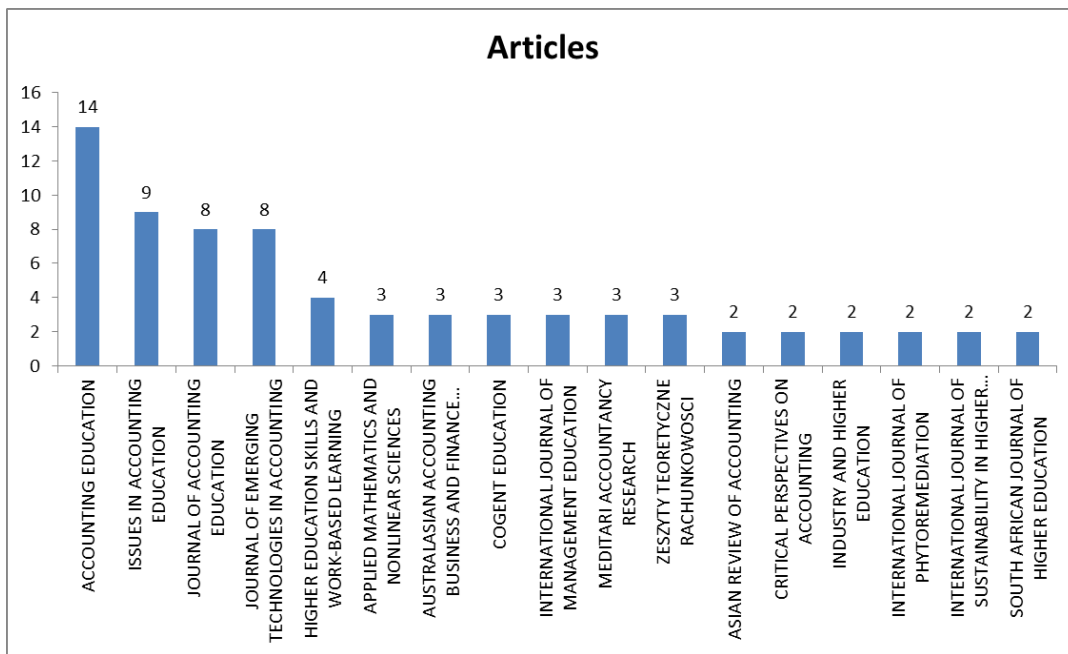


Figure 4: Source Analysis

Bradford's Law Analysis of Core Sources and Knowledge Concentration

To investigate more deeply how knowledge is disseminated in research on Artificial Intelligence (AI) and accounting pedagogy, Bradford's Law of Scattering was used to identify the core journals contributing to the field, as shown in Figure 5. This method allows grouping sources into zones based on their productivity and influence. The findings point to a clear core-periphery pattern, confirming

that a comparatively small set of journals accounts for an outsized share of total publications, while the rest of the output is spread among a greater number of less productive outlets.

The shaded core sources region emphasises the journals that constitute the field's main knowledge nucleus. This comprises Accounting Education, Issues in Accounting Education, Journal of Accounting Education and Journal of Emerging Technologies in Accounting. These journals exhibit the highest publication frequencies and occupy the lowest ranks on the Bradford distribution curve. Their dominance indicates that they serve as the central platforms for scholarly discourse on AI in accounting pedagogy. This finding further reinforces earlier source analysis, confirming that the field remains strongly anchored in specialised accounting education journals rather than fully absorbed into broader AI or general education outlets.

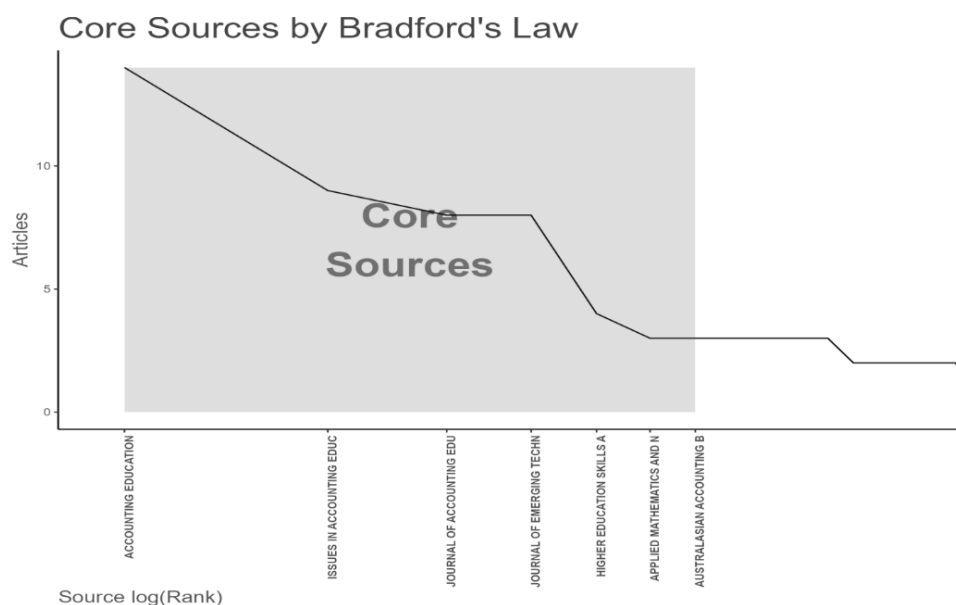


Figure 5: Bradford's Law Analysis

Distribution of Author Productivity: A Lotka's Law Perspective

Lotka's Law was used to analyse the distribution of author productivity (Figure 6) and investigate the structure of scholarly contributions in Artificial Intelligence (AI) and accounting pedagogy research. According to this law, the number of authors who publish n papers is inversely proportional to n^2 , which means that a small share of authors produce a large portion of publications, while most authors contribute only once (Adeoye et al., 2023; Munim et al., 2020). The observed author productivity distribution was compared with the theoretical Lotka curve. The results reveal a general conformity to Lotka's inverse power law pattern, albeit with some deviations as seen where a dominant proportion

of authors contribute only one publication, indicating a high level of occasional or transient participation in the field, the number of authors declines sharply as the number of publications increases and a few authors contributed three or more publications, forming a small core of highly productive scholarship.

However, the observed curve appears to fall below theoretical expectations at higher productivity levels, suggesting that the field lacks prolific researchers who are continuously contributing to the field of study. The steep decline from one to two or more publications highlights the prevalence of single-contribution authors, indicating low author retention and the possibility that researchers are entering the field but not contributing continuously. However, despite the dominance of occasional contributors, a small subset of authors demonstrates repeated productivity, forming the intellectual core of the field. This core group is essential in shaping the identity of the discipline. However, the relatively small size of this group in the present study suggests that AI in accounting pedagogy has not yet developed a strong, cohesive scholarly leadership structure.

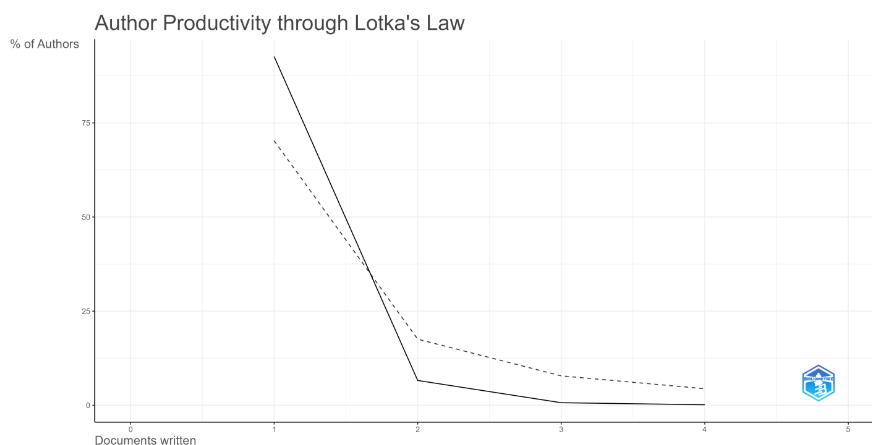


Figure 6: Author Productivity Distribution

Geographic Spread and Collaboration Trends Among Corresponding Authors

Figure 7 illustrates the distribution of corresponding authors across countries, revealing the contrast between Single Country Publications (SCP) and Multiple Country Publications (MCP). This examination offers perspectives on the worldwide organisation of knowledge production, the extent of international collaboration, and the standing of African scholarship within Artificial Intelligence

(AI) and accounting pedagogy. The figure clearly shows the United States as the leading contributor, with the highest number of corresponding author publications, trailed closely by Australia and China. The prominence of these countries is consistent with global patterns in AI research, where output is heavily concentrated in technologically advanced economies (Hung, 2025). South Africa appears among the more active contributors, highlighting its role as a regional leader in African research output. However, the absence or limited representation of many other African countries suggests a significant geographical imbalance in knowledge production (Hung, 2025).

A key feature of Figure 7 is the distinction between SCP (research conducted within a single country) and MCP (internationally co-authored research). The results show that SCP outweighs MCP in most countries, suggesting that research in this field is predominantly domestically oriented. International collaboration remains fairly limited even among major contributors like the United States and China.

The findings are consistent with earlier evidence of low international co-authorship rates, reinforcing the conclusion that the field has not yet achieved strong global interconnectedness (Hung, 2025; Sahar & Munawaroh, 2025).

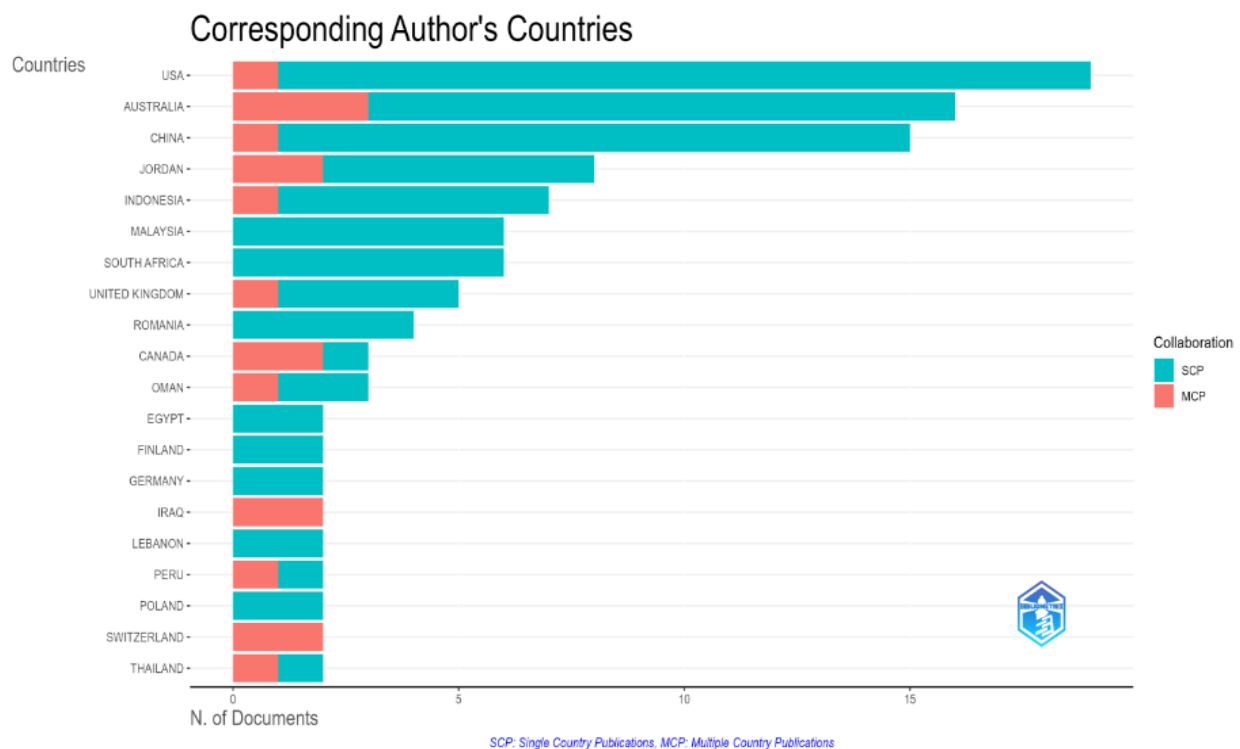


Figure 7: Distribution of corresponding-author publications by country, distinguishing single-country publications (SCP) and multiple-country publications (MCP)

Geographic Distribution of Research Output

The global distribution of scientific production in Artificial Intelligence (AI) and accounting pedagogy is depicted in Figure 8, which illustrates the geographic concentration and diffusion of research activity across different countries. The depth of shading indicates the relative number of publications, offering a visual depiction of global patterns of knowledge production. Consequently, the figure exposes a markedly uneven distribution of scientific output, heavily concentrated in a small number of leading economies. This concentration aligns with prior studies indicating that AI research output is disproportionately dominated by technologically advanced nations (Zeng & Wu, 2021).

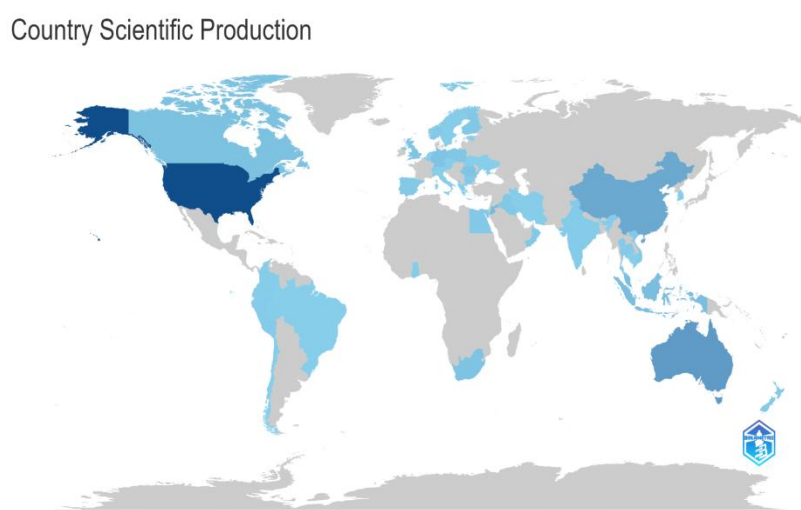


Figure 8: Geographic Distribution of Research Output

Citation Impact by Country

A citation analysis by country was conducted to present contributions to the literature on Artificial Intelligence (AI) and accounting pedagogy on a country-by-country basis. Citation analysis is particularly important in bibliometric studies because it reflects not only research productivity but also the intellectual influence, visibility, and scholarly impact of national research systems within the global academic community (Aroeira & Castanho, 2020). Figure 9 presents the findings, showing that the United States holds a dominant position in citation impact, with the highest number of citations (452). This considerable lead suggests that the United States serves as the primary intellectual hub in the field, shaping the theoretical and methodological direction of research on AI-driven accounting education. The country's dominance can be attributed to its advanced technological ecosystem, strong

higher education infrastructure, extensive research funding, and leadership in AI innovation (Zeng & Wu, 2021). Moreover, the high citation count suggests that studies originating from the United States are widely recognised and frequently utilised as foundational references in subsequent scholarly works.

Following the United States, Australia stands out as the second-most impactful contributor with 266 citations, while the United Kingdom accounts for 156 citations. The impressive citation figures for these nations underscore their pivotal role in driving pedagogical innovation in accounting education and incorporating emerging AI technologies into teaching and learning. These countries possess mature academic systems and established international research networks, which significantly enhance the visibility and dissemination of their scholarly outputs (Zeng & Wu, 2021). The results further showed that some countries with relatively moderate publication output demonstrate notable citation influence. For instance, Oman records 128 citations, the United Arab Emirates achieves 107 citations, and Lebanon records 59 citations despite comparatively lower research productivity. This pattern suggests that research quality and strategic positioning within niche thematic areas may be more important than publication quantity alone.

From an African perspective, South Africa's presence among the cited countries is noteworthy, with 37 citations. Even though this number is still substantially smaller than those of the top countries, it nonetheless points to South Africa's growing position as a regional leader in AI research and accounting education. Yet the scant representation of other African nations highlights enduring structural imbalances in the production of global knowledge. These disparities may be linked to inadequate research infrastructure, limited funding opportunities, restricted access to high-impact journals, and weaker integration into international scholarly networks.

The citation pattern further reveals an important asymmetry between research productivity and scholarly influence. While some countries generate high publication volumes, they do not necessarily attain proportional citation impact. Conversely, countries with fewer publications may achieve relatively high citation counts due to the quality, originality, or relevance of their research contributions. This finding reinforces the argument that citation influence is closely associated with research visibility, collaboration networks, and publication strategies rather than publication quantity alone. Overall, the citation analysis demonstrates that research influence in AI and accounting pedagogy remains highly concentrated among a few technologically advanced countries.

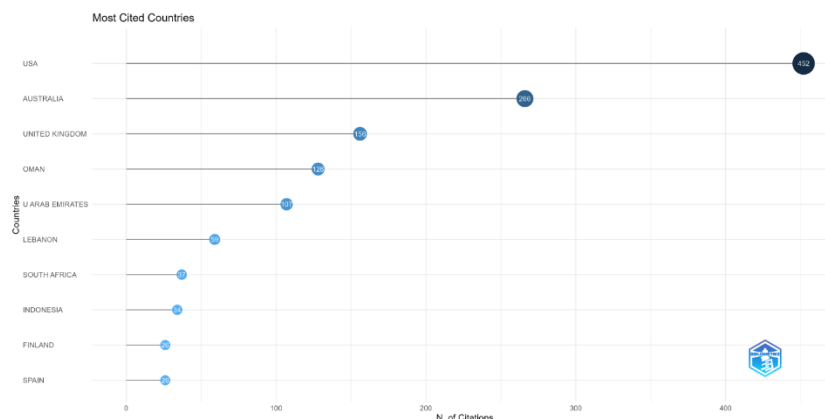


Figure 9: Citation Impact by Country

Thematic Structure of the Field

Figure 10 shows the keyword cloud produced from the bibliometric dataset, displaying the terms that appear most often in the literature on Artificial Intelligence (AI) and accounting pedagogy. In bibliometric analysis, keyword frequency provides important insights into the dominant research themes, conceptual orientations, and emerging intellectual trends within a scholarly field (Narong & Hallinger, 2023). The visualisation analysis indicates that artificial intelligence and accounting education are the most dominant keywords, with both appearing prominently at the centre of the word cloud. Their large size indicates their high frequency and confirms that the literature is fundamentally anchored on the intersection between AI technologies and pedagogical transformation in accounting education. This dominance demonstrates that the field is primarily concerned with how AI-driven tools and digital innovations are reshaping curriculum delivery, student learning experiences, professional competencies, and accounting training systems.

Closely related to these central concepts is the keyword accounting, which further reinforces the disciplinary focus of the literature. The repeated use of accounting-specific terminology implies that AI integration is not merely being examined as a general educational technology matter, but rather as a specialised pedagogical issue connected to the changing character of the accounting profession. This indicates a growing scholarly acknowledgement that the accounting discipline is experiencing substantial transformation driven by technological advancements (Shaleh, 2024; Shamsudin et al., 2025). The keyword cloud also highlights several emerging technological and pedagogical themes. Words such as ChatGPT, deep learning, data analytics, and information technology indicate increasing

scholarly attention to advanced AI applications in accounting education. This finding implies that the field is changing quickly in response to technological disruption and that current research is increasingly centred on the pedagogical implications of AI tools (Shamsudin et al., 2025).

Furthermore, educationally oriented terms such as higher education, students, learning, teaching, and education indicate that the literature is strongly concerned with the pedagogical dimensions of AI integration. These themes indicate that researchers are not only exploring technological innovation but are also investigating its implications for teaching effectiveness, learner engagement, curriculum redesign, and student outcomes. The emphasis on higher education further demonstrates that universities and professional training institutions are central sites for AI-driven transformation in accounting pedagogy. Another important observation is the thematic diversity reflected in the keyword structure. Although the field is dominated by a few major concepts, numerous minor keywords cluster around these central themes, indicating a relatively fragmented and interdisciplinary research landscape. This fragmentation suggests that the field is still evolving and has not yet achieved full conceptual consolidation.



Figure 10: Thematic Structure of the Field

Thematic Mapping and Intellectual Structure

The thematic map analysis of research on Artificial Intelligence (AI) and accounting pedagogy, shown in Figure 11, sorts research themes along two dimensions: centrality (degree of relevance) on the horizontal axis and density (degree of development) on the vertical axis. Centrality indicates how important and interconnected a theme is within the wider research field, whereas density captures the internal development and maturity of a thematic cluster (Sadatmoosavi et al., 2020; Alemdar, 2025). According to these dimensions, themes fall into four quadrants: motor themes, niche themes,

emerging or declining themes, and basic themes. The most prominent cluster appears within the basic theme's quadrant, where keywords such as artificial intelligence, accounting, and accounting education occupy highly central positions but at relatively low density. This suggests that these concepts form the foundational themes of the field. Their strong centrality verifies that they are fundamental to the overall intellectual structure of the literature and act as the main conceptual anchors linking various research streams. However, their comparatively lower density suggests that, despite their importance, the theoretical and methodological development surrounding these themes remains incomplete. This finding aligns with the work of Christiani and Widuri (2025) and Handoyo (2024), suggesting that AI and accounting education research is still evolving and has not yet reached full conceptual maturity.

Closely related to the keywords in the basic themes cluster are words such as accounting education, data analytics and skills. This cluster highlights the increasing emphasis on competency development and analytical capabilities in modern accounting curricula. The inclusion of skills and data analytics reflects the growing recognition that accounting graduates need digital, analytical, and technological competencies to remain relevant in AI-driven professional settings (Zhang et al., 2020; Ahmad, 2024). Although this cluster demonstrates moderate centrality, its lower density suggests that research in this area is still developing and requires greater conceptual consolidation (Christiani & Widuri, 2025; Handoyo, 2024). Additionally, in the quadrant motor themes, the cluster containing education, students, and teaching occupies a highly central position. Motor themes are regarded as the driving forces of a research field because they are both highly relevant and internally mature (Sadatmoosavi et al., 2020; Karakose et al., 2022). The prominence of this cluster suggests that pedagogical concerns remain central to discussions of AI in accounting education. Researchers are increasingly focused on how AI technologies influence student learning, instructional methods, learner engagement, and teaching effectiveness. This suggests that the field is not purely technology-driven but is fundamentally centred on educational transformation and learning outcomes.

The niche themes quadrant includes the cluster comprising deep learning, performance, and learning. Niche themes are marked by high density yet comparatively low centrality, indicating that they are specialised and internally developed but still not strongly linked to the wider field (Scarano et al., 2023; Thomas, Jayachandran & Biju, 2024). This suggests that research on deep learning and performance evaluation represents a focused but somewhat isolated area of inquiry. Scholars in this cluster appear to focus on technical and performance-related aspects of AI-supported learning systems rather than

on broader pedagogical concerns. Although currently peripheral, these themes possess significant potential for future integration into mainstream accounting education research as AI technologies become more sophisticated.

Clusters like accounting teaching, online homework, adoption, and impact fall within the emerging or declining themes quadrant. Themes in this quadrant typically represent either newly emerging areas that have not yet achieved prominence or older themes that are declining in relevance. The placement of online homework and adoption could point to earlier stages of educational technology research, which centred mainly on e-learning systems and digital assessment tools before advanced AI technologies emerged. However, these themes may also regain importance as educators increasingly explore AI-enabled personalised learning environments and automated assessment systems. The thematic mapping analysis demonstrates that research on AI and accounting pedagogy is evolving into a mature and multidimensional field characterised by strong foundational themes, rapidly emerging technological innovations and increasingly sophisticated pedagogical concerns. The emergence of generative AI, data analytics, and educational transformation themes suggests the field is advancing toward a deeper integration of intelligent technologies into accounting curricula and professional training systems.

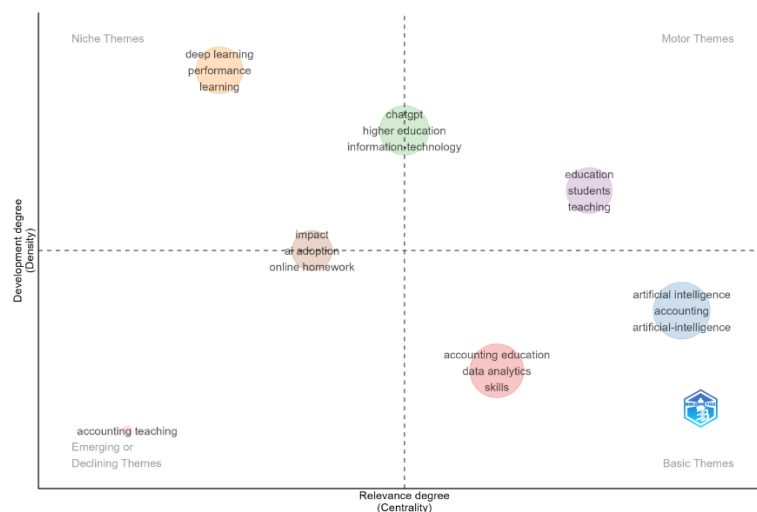


Figure 11: Thematic Mapping and Intellectual Structure

Conceptual Structure Analysis of the Literature

Figure 12 displays the conceptual structure map produced by Multiple Correspondence Analysis (MCA). Analysing conceptual structure is a key bibliometric method for uncovering the intellectual organisation of a research field by studying how keywords and thematic concepts relate to one another. By reducing dimensionality, MCA offers a visual depiction of how concepts cluster, thereby exposing the prevailing intellectual orientations and thematic connections in the literature on Artificial Intelligence (AI) and accounting pedagogy (Bretas & Alon, 2021).

In the centre-right area of the map, highly clustered concepts like artificial intelligence, AI, technology acceptance model, behavioural intention, perceived usefulness and user acceptance form a tightly connected thematic group. The proximity of these terms suggests a strong conceptual relationship focused on the behavioural adoption of AI technologies in educational settings. This indicates that a significant portion of the literature focuses on understanding how students, educators, and institutions perceive and adopt AI-driven accounting education. Closely associated with this cluster are concepts such as analytics, auditing, technology, skills, soft skills, and higher education. This grouping reflects the increasing integration of technological competencies and analytical capabilities into accounting curricula. The positioning of these concepts near the centre of the map suggests that they occupy an important bridge between technological innovation and educational transformation. In particular, the presence of skills and soft skills indicates growing recognition that future accounting professionals require both technical proficiency and adaptive human competencies to function effectively in an AI workplace (Anica-Popa et al., 2024).

Another major conceptual grouping appears in the upper-left section of the map, where themes such as higher education, surface learning, engagement, motivation, performance, deep learning, and satisfaction are concentrated. This cluster reflects the pedagogical and learner-centred dimension of the literature. The close association among these concepts suggests that researchers are increasingly concerned with the educational outcomes of AI integration, including student engagement, learning effectiveness, academic performance, and learner satisfaction. The emergence of both surface and deep learning indicates scholarly interest in how AI technologies influence the depth and quality of learning processes in accounting education. The conceptual map further highlights themes related to curriculum and instructional design, which demonstrates that AI applications in accounting pedagogy

are increasingly linked to adaptive learning systems, personalised instruction, and digital assessment mechanisms.

The conceptual structure map also offers valuable perspectives on how developmentally mature the field has become. The concentration of concepts around AI adoption, learning outcomes, and educational transformation suggests that literature is increasingly moving from exploratory discussions toward more applied and evaluative research. Researchers are no longer merely examining the potential of AI technologies; rather, they are increasingly assessing their effectiveness, acceptance and impact on educational practices and student outcomes.

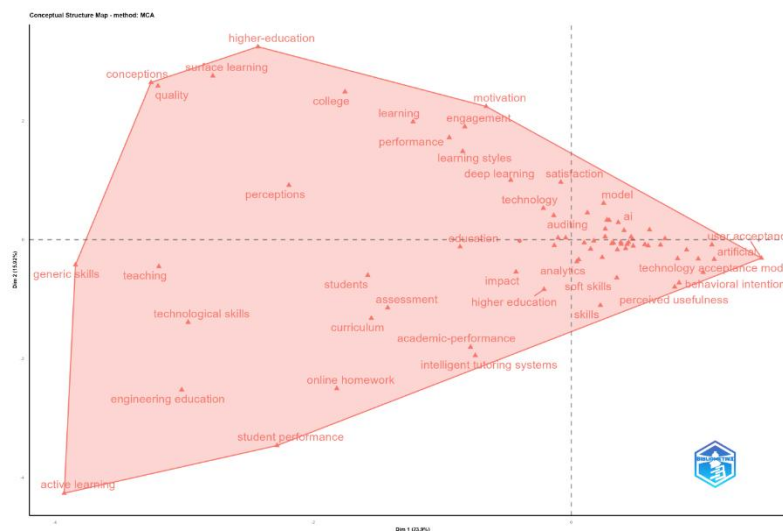


Figure 12: Conceptual Structure Analysis of the Literature

Collaboration Network

The network visualisation in Figure 13 depicts the collaborative ties among authors, with nodes representing individual scholars and links indicating co-authorship. In bibliometric studies, collaboration networks are important because they reveal the social and intellectual structure of a research field, identify influential research groups, and demonstrate the extent of scholarly interconnectedness (Ullah et al., 2022; Cui & Dong, 2025). The network structure reveals a fragmented yet evolving pattern of scholarly collaboration, characterised by several small and medium-sized clusters alongside a dominant collaborative group. This pattern suggests that research on AI and accounting pedagogy is still developing as an academic domain, with collaboration networks gradually emerging but not yet fully consolidated.

The most prominent collaborative cluster appears in the lower central region of the network and is dominated by authors such as Xu et al. (2023). These authors form a densely interconnected group with multiple co-authorship ties, indicating a strong and active research collaboration network. The node sizes in this cluster indicate that these scholars rank among the most productive and influential contributors in the field. Their central position also suggests they play a key role in generating knowledge and disseminating intellectual ideas within AI-driven accounting education research. Furthermore, the dense interconnections within this dominant cluster reflect a high degree of collaborative integration, which is often associated with greater research productivity, citation visibility, and theoretical influence. Such collaboration networks facilitate knowledge sharing, methodological advancement, and interdisciplinary integration, thereby strengthening the intellectual cohesion of the field.

Another significant cluster centres around McGuigan et al. (2012), who appears as a bridging figure connecting different collaborative groups. This positioning suggests an intermediary role within the network, linking otherwise separate scholarly communities, which displays an important role in emerging interdisciplinary fields. Other clusters are also visible across the network, including authors and Natoli et al. (2022). Additional isolated clusters involve scholars such as Fachrurrozie et al. (2025), as well as Mohd and Jaffar. These smaller groupings indicate localised or topic-specific collaborations that may centre on specialised research themes in AI and accounting education.

The presence of several separate, unconnected clusters suggests that the field is still fragmented, with only limited integration among research groups. Unlike mature academic disciplines characterised by large, interconnected collaboration networks, the present field appears to consist of several semi-independent scholarly communities. This fragmentation may be attributed to the field's interdisciplinary nature, with researchers from different disciplinary backgrounds, including accounting, education, information systems, and computer science. Another notable observation is the relatively limited degree of international integration evident in the collaboration structure. Although some clusters may include geographically diverse scholars, the network overall does not demonstrate extensive global interconnectedness. This finding aligns with earlier bibliometric evidence indicating low levels of multiple-country publications and limited international co-authorship. The relatively weak global integration suggests that collaboration remains concentrated within localised institutional or regional networks rather than broad international partnerships.

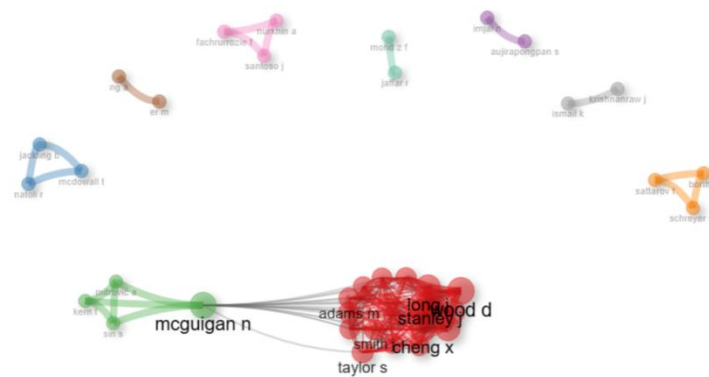


Figure 13: Collaboration Network

The place of Africa

The geographical spread and volume of research in Artificial Intelligence (AI) and accounting pedagogy offer valuable perspectives on global patterns of knowledge generation and the extent to which regions contribute to the advancement of accounting education amid ongoing technological change. As depicted in Table 1, substantial disparities exist across continents in terms of citation research capacity and intellectual influence. North America leads the field with 461 citations representing 33.38% of all scholarly influence in the field of AI and accounting pedagogy, followed by Asia with 27.81% (384 citations), Oceania 19.26% (266 citations) and Europe 15.06% (208 citations), while Africa records a meagre 44 citations representing 3.04% of citations in the field of study. These findings reveal a highly unequal global research landscape in which scholarly influence remains concentrated within a few technologically advanced regions.

Table 1: Continental Contribution

Continent	Total Citation	Percentage Contribution
North America	461	33.38
Asia	384	27.81
Oceania	266	19.26
Europe	208	15.06
Africa	44	3.04
South America	20	1.45
Total		100

Figure 14 shows that Africa remains significantly underrepresented within the global knowledge ecosystem. The continent accounts for only 42 citations, with South Africa contributing 37 and Egypt 5. This limited visibility suggests that African scholarship has yet to establish a strong intellectual presence within the rapidly expanding field of AI-enabled accounting education (Barbosa et al., 2025; Coşkun et al., 2026). The comparatively low citation impact reflects broader structural challenges, including inadequate digital infrastructure, limited research funding, insufficient AI expertise, weak institutional support, and restricted participation in international research collaborations. These barriers have constrained the continent's ability to contribute meaningfully to the development of AI-driven educational innovations and accounting pedagogy frameworks.

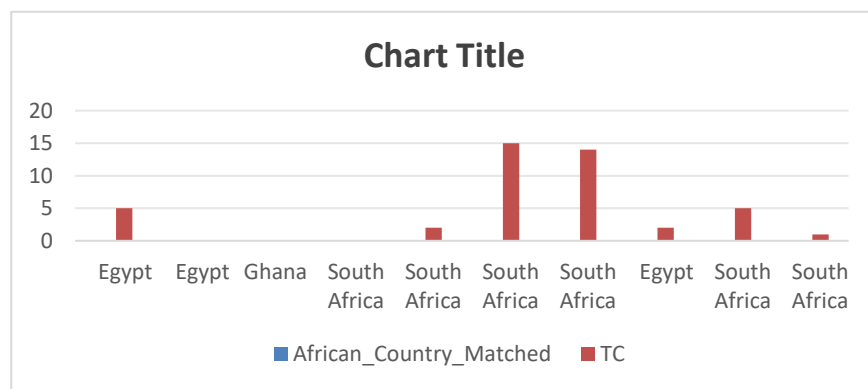


Figure 14: Africa Output and SDG Alignment

Africa's Research Contribution and Alignment with SDG 4 and SDG 9

Table 2 presents the study's findings, indicating that Africa occupies a comparatively marginal position in the global research landscape regarding Artificial Intelligence (AI) and accounting pedagogy. Although the bibliometric analysis demonstrates growing international interest in AI-based accounting education, African contributions remain limited in terms of publication output, citation impact, and participation in international research collaborations. South Africa emerges as the continent's most visible contributor, while many African countries remain absent from the global knowledge network. This pattern is consistent with broader evidence suggesting that research production in emerging technological fields is disproportionately concentrated in developed economies with stronger research infrastructure and innovation systems (Jaffe et. al., 2020; Graf & Menter, 2021; Pinar & Karahasan, 2025). Despite its relatively low research output, the African literature demonstrates significant alignment with the objectives of SDG 4 (Quality Education). The reviewed studies predominantly

focus on improving educational quality through curriculum reform, competency development, critical thinking, adaptive learning, metacognition, and student-focused pedagogical approaches. Moreover, the findings point to considerable alignment with SDG 9 (Industry, Innovation, and Infrastructure), as the studies identified in the African dataset centred on technological innovation, AI adoption, digital competencies, and the integration of emerging technologies into accounting education.

However, a key finding from the analysis is that the identified African studies rarely explicitly reference the SDGs, despite their clear relevance to sustainable development objectives. The SDG alignment assessment revealed that most publications were classified as having no direct SDG linkage, suggesting that researchers often address educational quality and technological innovation without explicitly situating their work within sustainability frameworks. This represents a missed opportunity to strengthen the policy relevance and international visibility of African scholarship, as evident in the works of Coşkun et al. (2026); Papakosmas et al. (2026); Zain et al. (2026), where they explicitly concluded that integration of SDG perspectives could enhance the contribution of accounting education research to global debates on sustainable development, digital transformation and educational innovation. As a result, greater investment is needed in research capacity, digital infrastructure, and international collaboration to strengthen Africa's participation in the global discourse on AI and accounting education.

Overall, the evidence suggests that African research is already contributing meaningfully to the advancement of SDG 4 and SDG 9 through its focus on educational quality, technological innovation, and competency development. Nevertheless, stronger research capacity, increased scholarly visibility, and explicit incorporation of SDG frameworks are necessary to ensure that Africa plays a more prominent role in shaping the future of AI-enabled accounting education and sustainable development.

Table 2: Africa's Research Contribution and Alignment with SDG 4 and SDG 9

Author & Publication Year	Number Citations	Title	Keywords
Saad and Ameen (2024)	5	Adapting accountants to the AI revolution: university strategies for skill enhancement, job security and competence in accounting	Curriculum reform, Job skills, Soft skills, Technological proficiency, Tertiary education

Bin-Nashwan et al. (2026)	0	Accounting knowledge as a compass in ChatGPT adoption among accounting students in higher educational institutions	Accounting, ChatGPT, Artificial intelligence, Accounting knowledge, Higher education
Betakan et al. (2024).	0	Determinants of learning strategies among undergraduate accounting students: a study in an emerging economy.	Accounting education, undergraduate accounting students, learning strategies/approaches
Zijl et al. (2026).	0	How close is AI to replacing accounting consultants? Insights from a comparative study of multiple AI models and exit-level accounting students	Artificial intelligence, Accounting, Developing economy, AI model comparison, Critical thinking
Sexton & Rudman (2022).	2	Program Renewal: Students' Perception of Changes to Teaching Pedagogy in Auditing.	Accounting education, pedagogy, scaling reflections
Goosen & Steenkamp (2023).	15	Activating accounting students' decision-making skills through a reflective self-assessment workshop on learning styles	Decision-making skills, Learning styles, Metacognition, Self-regulated learning, Adaptive learning strategies
Barac et al. (2016).	14	Factors influencing students' learning approaches in auditing	Accounting education, Auditing, Quantitative research, Deep and surface learning, Pedagogic research
El-Bassiouny (2025).	2	Beyond the bottom line: the case of an integrated sustainability accounting course utilising the PRME i5 framework	Accounting education, Sustainability accounting, Education for sustainable development (ESD), PRME i5 framework, Playful learning
Kruger (2018).	5	Students' and lecturers' perceptions of the effect of open-book examinations on teaching and assessment at departments of accountancy at South African universities.	Open book examination, Competency-based education, Educational tests and measurements
Ganda et al. (2016).	1	Independent Research and a Deep Approach to Learning Accounting Concepts: Students' View	Independent learning, Deep Approach to learning, Accounting concepts

CONCLUSION

This study offers a thorough bibliometric examination of Artificial Intelligence (AI) and Accounting Pedagogy, along with an assessment, aligned with the SDGs, of the evolving global research landscape. The study therefore analyses research publications on Artificial Intelligence (AI) and Accounting Pedagogy from 1986 to 2026. Using several bibliometric methods, including performance analysis, citation analysis, Bradford's Law, thematic mapping, conceptual structure analysis, and collaboration network analysis, the study provides a holistic understanding of the field's intellectual, conceptual, and geographical evolution. The findings reveal that AI and accounting pedagogy constitute a rapidly expanding but still maturing research domain. Although the field exhibited sporadic growth during its formative years, publication output accelerated significantly after 2022, reflecting the transformative influence of machine learning, generative AI, data analytics, and digital learning technologies on accounting education.

Analyses of sources and citations show that scholarly influence is still concentrated in a small set of specialised accounting education journals and a limited number of heavily cited countries, especially the United States, Australia, and the United Kingdom. Although these countries lead in global knowledge production and citation impact, contributions from countries such as Oman, the United Arab Emirates, Indonesia, and South Africa point to the field's increasing internationalisation. Nevertheless, substantial disparities remain, particularly regarding African participation, highlighting persistent inequalities in global research capacity, visibility, and influence.

The thematic and conceptual analyses show that the literature centres on foundational themes, including artificial intelligence, accounting education, accounting, higher education, students, teaching, data analytics, and technology adoption. This indicates that AI research in accounting education is increasingly focused not only on technological innovation but also on pedagogical effectiveness, learner engagement, curriculum design, and the development of professional competencies. Furthermore, the collaboration network analysis highlights several influential research clusters but also reveals a fragmented scholarly landscape characterised by limited international integration. The relatively low level of global collaboration suggests that stronger cross-border partnerships are necessary to accelerate theoretical development, methodological innovation, and knowledge diffusion. This challenge is particularly relevant for African scholars and institutions seeking greater participation in global AI and accounting education research.

Despite the field's significant growth, several gaps remain evident. African contexts, sustainability-oriented pedagogies, digital inequality, and localised educational challenges remain underexplored within the existing literature. Therefore, future studies ought to prioritise context-specific inquiries that explore how AI technologies can be effectively incorporated into accounting education systems in developing economies. More focus should likewise be placed on matters of AI ethics, academic integrity, responsible innovation, and the long-term consequences of generative AI for accounting curricula and professional training. To conclude, this study shows that AI is fundamentally reshaping the future of accounting education, altering not only how accounting is taught but also the skills future accounting professionals will need. As AI technologies continue to advance, educators, researchers, policymakers, and professional bodies will face the challenge of ensuring that technological innovation goes hand in hand with pedagogical relevance, inclusivity, ethical responsibility, and sustainable development. Striking this balance will be essential to prepare future accountants who can thrive in an increasingly intelligent and digitally driven global economy.

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