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The Evolution of Technology in Accounting Education: A Bibliometric Analysis of Research Trends and Teaching Innovations

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Abstract: The rapid advancement of technology has significantly transformed accounting education, necessitating a deeper understanding of its impact on teaching practices and research trends. This study aims to explore the evolution of technology in accounting education through a bibliometric analysis, focusing on identifying key research trends, innovative teaching methods, and their implications for curriculum development. The significance of this study lies in its ability to provide actionable insights for educators, policymakers, and researchers to enhance pedagogy, align academic standards with industry needs, and prepare students for a technology-driven professional landscape. The methodology involves a comprehensive bibliometric analysis of peer-reviewed literature on technology in accounting education. Using data visualization and trend analysis tools, the study examines publication patterns, influential works, emerging themes, and key research gaps. The applied approach ensures a robust synthesis of existing knowledge while uncovering future opportunities for academic and practical advancements. The findings reveal significant trends in the adoption of digital tools, such as artificial intelligence, data analytics, and cloud computing, as well as their integration into accounting education. These outcomes demonstrate the growing emphasis on equipping students with competencies aligned with modern industry requirements. The study also identifies innovative teaching practices and potential areas for further research, offering valuable contributions to the academic community and professional organizations. Overall, this study contributes to the field by providing a roadmap for enhancing accounting education through technology integration, fostering better alignment between academia and industry, and encouraging future research on emerging technological trends.

Keywords: *Accounting Education, Technology, Teaching Innovations, Accounting Students, E-learning, Digital, Bibliometric analysis, VOSviewer*

1. Introduction

The field of accounting education has undergone significant transformation with the emergence of technology. Traditional teaching methods, which relied heavily on manual processes and theoretical instruction, are being replaced by innovative, technology-driven approaches that prepare students for the complexities of a data-driven professional landscape. The integration of technologies such as artificial intelligence (AI), cloud computing, and data analytics has reshaped how accounting concepts are taught, understood, and applied in real-world contexts. This evolution underscores the necessity for accounting education to align with advancements in technology to ensure the relevance and competency of future professionals. Scholarly attention to the intersection of technology and accounting education has grown substantially over the past few decades, leading to a wealth of research on the subject. Bibliometric analysis, a method that quantitatively evaluates academic literature, offers a valuable tool for understanding the scope, impact, and trends of research in this domain. By identifying key publications, influential authors, and emerging themes, bibliometric studies provide a comprehensive view of how technology is shaping accounting education.

This study seeks to investigate the evolution of technology in accounting education by analyzing research trends and teaching innovations. Specifically, it aims to trace the historical progression of technological integration, explore how emerging tools have transformed pedagogical practices, and highlight innovative teaching methods that enhance learning outcomes. Additionally, it identifies under-researched areas and proposes future directions to address the challenges and opportunities presented by technological advancements. In doing so, this paper contributes to the broader discourse on accounting education by providing actionable insights for educators, policymakers, and institutions. It emphasizes the importance of leveraging technology not only to enhance the quality of education but also to meet the dynamic demands of

the accounting profession. By offering a detailed bibliometric analysis, this study sets the stage for informed decision-making and future research in the ever-evolving landscape of accounting education.

2. Literature Review

The concept of "bibliometrics" was first introduced by Belgian documentalist Otlet in the 1930s and later gained prominence through Pritchard, (1969). Bibliometric analysis applies quantitative methods to scholarly works, including journal articles, conference papers, books, and patents. This technique enables researchers to assess academic productivity and influence within a specific field or across disciplines. According to Öztürk et al. (2024), bibliometric analysis involves systematically examining publications in a particular area or journal to generate scientific insights. It utilizes statistical and numerical approaches to analyze indicators such as yearly publication counts, trending topics, leading institutions, prominent journals, influential authors, citation statistics, and keyword patterns. Sweileh et al. (2017) highlight that bibliometric analysis is a versatile tool for assessing the quality and quantity of scholarly outputs, as well as identifying trends and patterns within research domains. Commonly used indicators include publication types, outlets, author affiliations, document origins, and the h-index (Ahmi & Mohd Nasir, 2019). Bibliometric analysis is a prominent method for observing changes in research trends over time and can classify publications by year, author, institution, or country to reveal recurring themes. Additionally, bibliometric tools like VOSviewer and Publish or Perish allow for the visualization of co-authorship, keyword trends, and citation networks, enhancing the understanding of how knowledge is disseminated and interconnected (Nasir et al., 2023). The application of bibliometrics in this context not only helps track the progression of themes such as AI, blockchain, and data analytics in education but also identifies underexplored areas for future research (Nasir et al., 2023; Sweileh et al., 2017).

As described by Rusly et al. (2019), bibliometric analysis offers a structured framework for uncovering details such as keyword usage, author contributions, and citation patterns. Similarly, Ho (2007) defines bibliometric analysis as a quantitative method that provides descriptive insights into publications based on fields, timeframes, countries, or their intersections. Bibliometric analyses highlight an exponential growth in publications related to technology in accounting education, with significant contributions from global academic collaborations (Sangster et al., 2020). Research themes have evolved from basic technological integration to the ethical implications of advanced tools and their role in a globalized education landscape. Moreover, studies indicate a growing focus on the long-term impact of technology-driven education on career readiness and professional success (Tingey-Holyoak & Burritt, 2012).

The integration of technology into accounting education has been a transformative journey, significantly impacting traditional pedagogies and aligning them with the dynamic demands of the accounting profession. Early research primarily focused on the adoption of fundamental tools such as spreadsheets and basic accounting software, which transitioned students from manual to computerized workflows (McCarthy, 2003). These innovations improved efficiency and laid the groundwork for incorporating advanced technologies like data analytics and cloud computing into modern curricula (Watty et al., 2010). Subsequent studies emphasize the necessity of teaching not only technical skills but also critical thinking and analytical capabilities, which are vital for leveraging these advanced tools effectively (Apostolou et al., 2013). Recent advancements, such as artificial intelligence (AI), blockchain, and data analytics, have had a profound impact on accounting education.

AI-driven platforms, including Cognii and ALEKS, have been shown to enhance personalized learning experiences, improving student comprehension and retention rates (Al-Htaybat et al., 2018). Blockchain technology has gained prominence for its practical application in teaching auditing and secure record-keeping, enabling students to engage directly with emerging industry tools (Coyne & McMickle, 2017). Additionally, data analytics tools like Tableau and Power BI are increasingly integrated into the curriculum, developing students' competencies in analyzing and visualizing complex datasets (Richins et al., 2017). The inclusion of generative AI platforms, such as ChatGPT, in 2023 has opened new avenues for adaptive learning and problem-solving in accounting education (Damerji & Salimi, 2023). For example, ChatGPT has been used in accounting courses to assist students in drafting financial reports, providing instant feedback on errors, and generating explanations for complex accounting standards. Case studies from institutions implementing ChatGPT highlight improvements in student engagement and a reduction in the time needed to grasp intricate concepts, demonstrating its potential to transform traditional teaching methodologies.

Technology has fostered pedagogical innovations such as simulations, virtual labs, and gamification, which create immersive learning environments. Simulations replicate real-world accounting scenarios, enhancing problem-solving and decision-making skills (Boyce et al., 2001). Comparative studies reveal that simulation-based learning often surpasses traditional lecture methods in fostering critical thinking and retention (Smith et al., 2015). The accessibility of accounting education has also improved through e-learning platforms and massive open online courses (MOOCs), which offer flexible and cost-effective learning solutions (Domínguez et al., 2013). Furthermore, immersive technologies like augmented reality (AR) and virtual reality (VR) are increasingly being explored for their potential to simulate complex accounting processes and environments. For example, AR has been used to overlay financial data onto physical objects, allowing students to interact with and analyze data in real-time scenarios. VR environments have been employed to create virtual audit rooms where students can practice conducting audits, receiving immediate feedback on their performance. These applications have garnered positive feedback from users, highlighting their effectiveness in enhancing engagement and understanding (Qasim & Kharbat, 2020).

Despite its transformative potential, the integration of technology into accounting education encounters several challenges, such as bridging the digital divide, resistance to change among educators, and the complexity of adopting new tools. Students in low-income regions often lack access to reliable internet and devices, worsening educational inequalities (Johnson et al., 2019). Furthermore, educators frequently cite insufficient training and concerns about obsolescence as barriers to embracing technological advancements (Smith & Brown, 2020). Addressing these issues through continuous professional development and adaptable curriculum is essential to maximize the benefits of technology integration (Howieson et al., 2014). For instance, programs such as the "Technology in Education" workshops offered by leading academic institutions focus on training educators in using advanced tools like data analytics software and AI platforms. Additionally, initiatives like peer-led training sessions and collaborative development of tech-enhanced lesson plans have proven effective in reducing resistance and fostering a culture of innovation among educators.

Current literature highlights significant gaps, particularly in understanding the long-term career impacts of technology-driven education. There is also a need for comparative analyses of various technologies across diverse educational settings to ensure equitable and effective implementation. Future research should prioritize longitudinal studies to assess the evolving relationship between technological advancements and professional competencies in accounting (Al-Htaybat et al., 2018; Richins et al., 2017). Methodologies such as cohort studies tracking graduates over several years, and frameworks like the Technology Acceptance Model (TAM) integrated with industry-specific metrics, could provide robust insights into how technological competencies impact career progression and adaptability. Furthermore, studies such as Damerji and Salimi (2023) emphasize the importance of integrating AI and blockchain technologies into the accounting curriculum to prepare students for future industry challenges. The evolving intersection of technology and accounting education has demonstrated immense potential to enhance learning outcomes, accessibility, and alignment with industry needs. While challenges persist, ongoing research and innovation offer promising avenues to address these issues. By fostering collaboration among educators, policymakers, and industry professionals, the field can continue to advance and meet the demands of a rapidly changing professional landscape.

3. Methodology

Search Strategy

This study conducts a bibliometric analysis to create a map of the research environment on The Evolution of Technology in Accounting Education. To achieve the research objectives, the Scopus database was used as the primary data source in this study. The Scopus database is known for its extensive collection of bibliographic information. Figure 1 outlines the steps of the bibliometric analysis, from the selection of data sources and the search strategy to the data extraction that leads to the final documents. The search strategy was created by combining different keywords. The search query included phrases related to The Evolution of Technology (such as "accounting education" and "accounting student") and specifically related to technology. The phrases were combined, and the search was refined using Boolean operators (AND, OR). After applying the search strategy, a preliminary collection of articles was compiled from the Scopus database and then screened against the inclusion and exclusion criteria. After finalizing the list of relevant articles, VOSviewer and Publish or Perish software were used in this study to analyze publication trends, identify highly cited publications and examine

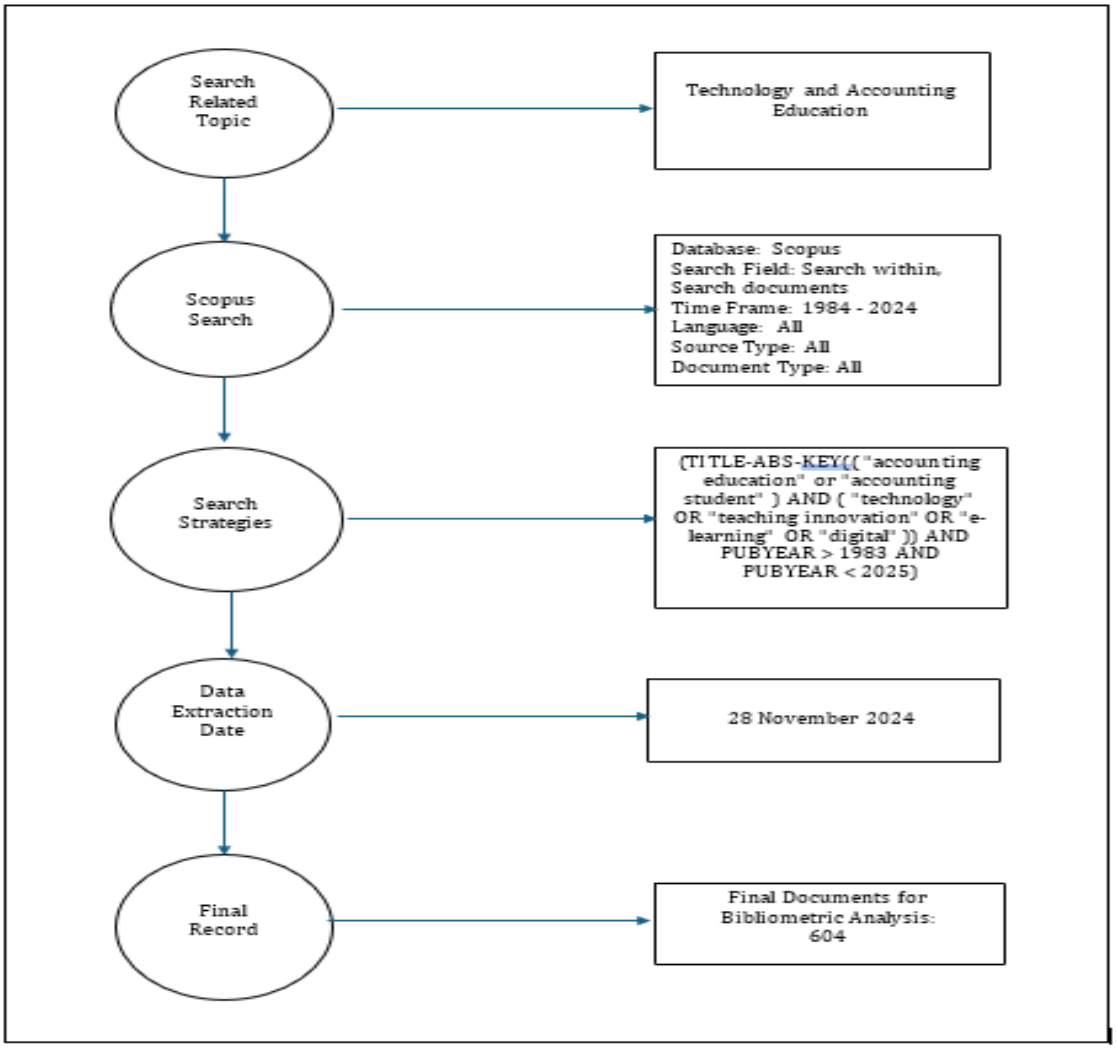
patterns of keyword co-occurrence. In addition, information on the affiliation of authors, institutions and countries was retrieved and analyzed to investigate research collaborations.

This section presents the bibliometric analysis of the scientific research findings on "The Evolution of Technology in Accounting Education". This study focuses on documents published in the Scopus database between 1984 and 2024 which led to a total of 604 articles being included as final documents for bibliometric analysis.

To summarise, this study uses the following bibliometric indicators for publication of "The Evolution of Technology in Accounting Education", as subsequently discussed:

- Documents Profiles i.e., number of research documents published in Scopus between 1984 and 2024 (by Document Type, Source Type, Language, and Subject Area)
- Publication Trends per year: Total Publications and Citations
- Publication by Authors: Most Productive Authors
- Publication by Institutions: Most Productive Institutions
- Publication by Countries: Top Countries Contributed
- Publication by Source titles: Most Active Source
- Citation Metrics
- Highly Cited Documents: Top Highly Cited
- Top Keywords; Co-occurrence Analysis of Author's Keywords

Figure 1: Flow diagram of the search strategy



4. Results and Discussion

Documents Profiles

Table 1 outlines the distribution of 604 research-related documents, highlighting a strong focus on original research, with research articles comprising 64.40% of the total as the primary medium for disseminating peer-reviewed findings. Conference papers account for 20.86%, emphasizing the importance of academic gatherings in sharing emerging ideas. Book chapters (7.12%) provide detailed exploration of subtopics, while review papers (2.98%) suggest the need for more systematic reviews to consolidate findings and address research gaps. Conference reviews (2.81%) reflect an interest in summarizing academic discussions, while minimal contributions from errata (0.83%), books (0.66%), and retracted papers (0.33%) indicate high-quality research output, with only two retractions demonstrating strong academic integrity. Overall, the data underscores a predominant focus on original research and conferences while highlighting opportunities for growth in review papers, books, and comprehensive texts, showcasing the dynamic and diverse nature of the field.

Table 1: Document Type

Document Type	Total Publications (TP)	Percentage (%)
Article	389	64.40%
Conference Paper	126	20.86%
Book Chapter	43	7.12%
Review	18	2.98%
Conference Review	17	2.81%
Erratum	5	0.83%
Book	4	0.66%
Retracted	2	0.33%
Total	**604**	**100.00**

Table 2 shows the distribution of publication types, with journals accounting for 67.22% of the 604 publications, emphasizing their role in disseminating high-quality, peer-reviewed research. Conference proceedings (18.05%) highlight the significance of academic gatherings in fostering collaboration and addressing emerging trends. Book series (9.27%) and standalone books (5.30%) reflect the value of thematic collections and comprehensive texts in exploring specialized topics. A trade journal with just one publication (0.17%) indicates minimal engagement with industry-focused outlets, pointing to a primarily academic research focus. This distribution underscores journals as the primary medium for academic dissemination, with conferences and book-related sources playing complementary roles. The limited presence of trade journals suggests an opportunity to enhance the practical impact of research through industry-oriented channels.

Table 2: Source Type

Source Type	Total Publications (TP)	Percentage (%)
Journal	406	67.22%
Conference Proceeding	109	18.05%
Book Series	56	9.27%
Book	32	5.30%
Trade Journal	1	0.17%
Total	**604**	**100.00**

Table 3 shows that English dominates the 605 analyzed publications, accounting for 97.85%, reflecting its role as the global standard for research dissemination in international fields like technology and accounting education. Other languages include Spanish (0.99%), Portuguese (0.66%), and single publications in Croatian, Polish, Russian, and Ukrainian (0.17% each), indicating localized or regional focus. One dual-language document highlights efforts to bridge linguistic audiences. The prevalence of English underscores its role as academia's lingua franca, while non-English publications emphasize the value of addressing regional contexts and fostering inclusivity to enrich the field with diverse perspectives.

Table 3: Languages

Language	Total Publications (TP)*	Percentage (%)
English	591	97.85%
Spanish	6	0.99%
Portuguese	4	0.66%
Croatian	1	0.17%
Polish	1	0.17%
Russian	1	0.17%
Ukrainian	1	0.17%
Total	**605**	**100.00**

*one document has been prepared in dual languages

The 605 analyzed publications reveal a strong interdisciplinary focus on technology in accounting education (Table 4). Most research falls within Business, Management, and Accounting (56.46%) and Social Sciences (53.64%), emphasizing accounting education, pedagogy, and societal impacts of technology. Computer Science (27.81%) highlights the integration of tools like e-learning, data analytics, and blockchain. Contributions from Economics, Econometrics, and Finance (18.54%) show financial principles intersecting with educational innovation, while Engineering (10.43%) and Decision Sciences (6.62%) reflect technical and analytical support for decision-making. Smaller contributions from Mathematics (4.64%), Arts and Humanities (3.31%), and Environmental Science (2.81%) broaden the scope, while Psychology (1.82%) and Health Professions (0.83%) point to emerging areas like cognitive learning. Minimal representation in Materials Science (0.33%), Medicine (0.50%), and Earth Sciences (0.66%) indicates limited but intriguing interdisciplinary applications. A Multidisciplinary category (0.33%) underscores growing research complexity. This distribution highlights a robust focus on core areas like Business, Social Sciences, and Computer Science, with smaller fields offering opportunities for future exploration and innovation in addressing educational and technological challenges.

Table 4: Subject Area

Subject Area	Total Publications (TP)	Percentage (%)
Business, Management and Accounting	341	56.46%
Social Sciences	324	53.64%
Computer Science	168	27.81%
Economics, Econometrics and Finance	112	18.54%
Engineering	63	10.43%
Decision Sciences	40	6.62%
Mathematics	28	4.64%
Arts and Humanities	20	3.31%
Environmental Science	17	2.81%
Physics and Astronomy	15	2.48%
Psychology	11	1.82%
Energy	8	1.32%
Agricultural and Biological Sciences	5	0.83%
Health Professions	5	0.83%
Earth and Planetary Sciences	4	0.66%
Medicine	3	0.50%
Materials Science	2	0.33%
Multidisciplinary	2	0.33%

Publication Trends

Table 5 shows a significant growth in research output and citation impact from 1984 to 2024, totalling 604 publications. The early years (1984–2000) had limited activity, with fewer than seven publications annually. Output increased sharply from 2010, peaking in 2021 (67 publications), 2023 (86), and 2024 (83). While recent years show high publication numbers, their citation impact remains low due to limited time for citations (C/P: 3.43 in 2023, 1.11 in 2024). Earlier years, such as 1998 (C/P: 47.33) and 2003 (C/P: 49.10), had landmark studies with lasting influence. Citations peaked in 2020 (722) and 2017 (489), reflecting significant

contributions. Metrics like the h-index (14) and g-index (26) were highest for 2020–2021 publications. Early impactful works, such as those from 1991 (15 citations) and 1994 (19 citations), laid foundational groundwork. The data highlights consistent growth in research activity and citation influence, with recent outputs expected to gain impact as citations accumulate.

Table 5: Year of Publication

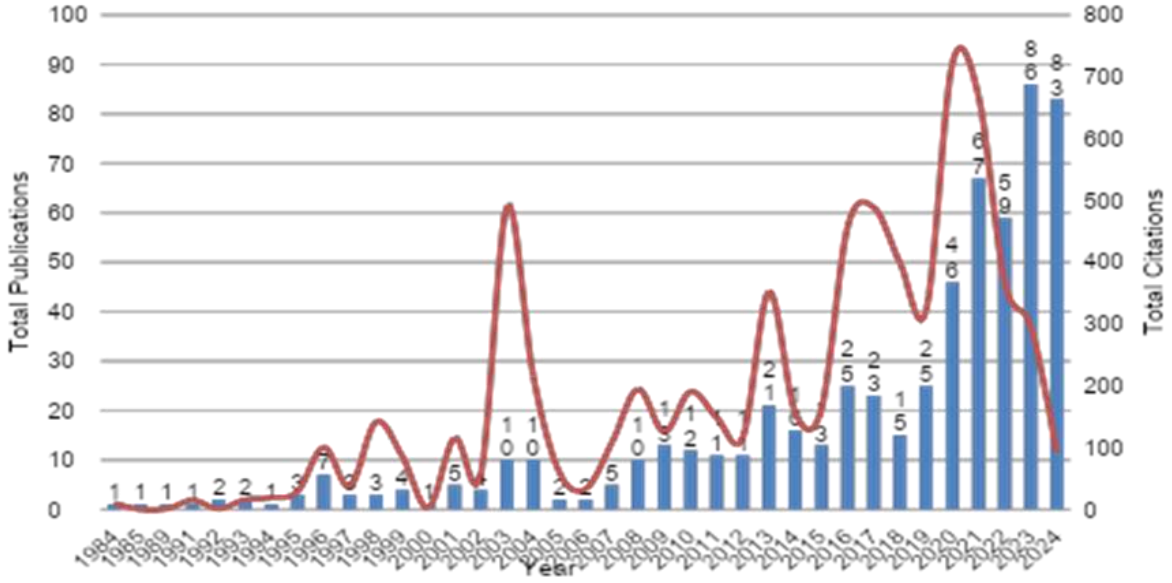
Year	TP	NCP	TC	C/P	C/CP	*h*	*g*
1984	1	1	10	10.00	10.00	1	1
1985	1	0	0	0.00	0.00	0	0
1989	1	1	1	1.00	1.00	1	1
1991	1	1	15	15.00	15.00	1	1
1992	2	1	1	0.50	1.00	1	1
1993	2	2	16	8.00	8.00	2	2
1994	1	1	19	19.00	19.00	1	1
1995	3	3	29	9.67	9.67	3	3
1996	7	6	101	14.43	16.83	5	7
1997	3	3	37	12.33	12.33	2	3
1998	3	3	142	47.33	47.33	3	3
1999	4	4	86	21.50	21.50	4	4
2000	1	1	3	3.00	3.00	1	1
2001	5	5	116	23.20	23.20	5	5
2002	4	4	57	14.25	14.25	4	4
2003	10	8	491	49.10	61.38	7	10
2004	10	7	216	21.60	30.86	5	10
2005	2	2	60	30.00	30.00	2	2
2006	2	2	33	16.50	16.50	2	2
2007	5	5	108	21.60	21.60	4	5
2008	10	8	195	19.50	24.38	6	10
2009	13	7	125	9.62	17.86	5	11
2010	12	8	191	15.92	23.88	6	12
2011	11	9	149	13.55	16.56	6	11
2012	11	9	116	10.55	12.89	5	10
2013	21	18	353	16.81	19.61	9	18
2014	16	10	157	9.81	15.70	8	12
2015	13	12	162	12.46	13.50	6	12
2016	25	22	457	18.28	20.77	9	21
2017	23	19	489	21.26	25.74	10	22
2018	15	15	399	26.60	26.60	9	15
2019	25	22	322	12.88	14.64	8	17
2020	46	37	722	15.70	19.51	13	26
2021	67	54	669	9.99	12.39	14	24
2022	59	42	367	6.22	8.74	12	17
2023	86	53	295	3.43	5.57	9	14
2024	83	29	92	1.11	3.17	5	7
Total	**604**						

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index.

Figure 2 highlights the evolution of the field through publication growth and citation trends. During 1984–2000, research output was minimal, with fewer than seven publications annually, reflecting the domain's early stages. A gradual rise followed from 2000 to 2010, with peaks in years like 2003 and 2007 due to foundational studies. A sharp surge began in 2010, accelerating in the 2020s, with notable peaks in 2021 (67 publications), 2023 (86), and 2024 (83), signalling increased scholarly focus. Citations reveal key years of influence, such as 1998, 1999, and 2003, where impactful studies garnered high citations despite low output. From 2010 to 2020, citations rose steadily, peaking in 2020 with over 700, reflecting significant contributions. Recent years (2023–

2024) show lower citations, expected due to the recency of these works. The shift from isolated, highly impactful studies in the early years to broader dissemination with distributed impact reflects the field's growth. While earlier works show high citations per publication, recent output highlights expanding interest and interdisciplinary advancements. These newer publications, though yet to reach their full citation potential, are poised to shape the future direction of the field.

Figure 2: Total Publications and Citations by Year



Publications by Authors

Table 6 highlights the most productive authors in the field, led by John M. Hassell (Indiana University, USA) with 15 publications, 778 citations, and an h-index of 13, demonstrating sustained influence. Barbara Apostolou (Louisiana State University, USA) follows with 13 publications, 643 citations, and a strong citation impact (C/P = 49.46). Stephanie F. Watson (C/P = 81.75) and James E. Rebele (C/P = 60.86) stand out for their high citation impact despite fewer publications. U.S.-based authors dominate, reflecting strong American institutional leadership. Contributions from Australia (e.g., Nicholas McGuigan and Thomas Kern), Europe (e.g., Soledad Moya and Jordi Carenys), Asia (e.g., Marhaiza Ibrahim), and Africa (e.g., Kirstein Marina) showcase growing global interest, though with relatively modest impact metrics compared to U.S. and European counterparts. The data highlights the notable influence of authors with fewer but highly cited works (e.g., Watson, Rebele) and consistent contributions from high h-index authors (e.g., Hassell, Apostolou). It also points to opportunities for emerging authors, particularly in Asia and Africa, to enhance their impact, while underscoring the expanding global scope of the field.

Table 6: Most Productive Authors

Author's Name	Affiliation	Country	TP	NCP	TC	C/P	C/CP	*h*	*g*
Hassell, John M.	Indiana University	United States	15	15	778	51.87	51.87	13	15
Apostolou, Barbara	Louisiana State University	United States	13	13	643	49.46	49.46	12	13
Dorminey, Jack W.	WEST VIRGINIA UNIVERSITY	United States	9	9	419	46.56	46.56	9	9
Rebele, James E.			7	7	426	60.86	60.86	7	7
McGuigan, Nicholas	Monash University	Australia	6	5	54	9.00	10.80	0	0

Hamdan, Allam	Ahlia University	Bahrain	5	3	13	2.60	4.33	1	3
Kern, Thomas	Macquarie University	Australia	5	4	35	7.00	8.75	0	0
Watson, Stephanie F.	University of Central Arkansas	United States	4	4	327	81.75	81.75	0	0
Moya, Soledad	ESADE Business School	Spain	4	4	126	31.50	31.50	0	0
Kunz, Rolien	University of Pretoria	South Africa	4	4	34	8.50	8.50	0	0
Ibrahim, Marhaiza	Universiti Utara Malaysia	Malaysia	4	3	11	2.75	3.67	0	0
Stanley, Trevor	Queensland University of Technology	Australia	4	4	125	31.25	31.25	0	0
Kirstein, Marina	University of Pretoria	South Africa	4	4	34	8.50	8.50	0	0
Seethamraju, Ravi	University of Sydney Business School	Australia	4	1	8	2.00	8.00	0	0
Carenys, Jordi	EADA Business School	Spain	4	3	93	23.25	31.00	0	0

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index.

Publications by Institutions

Table 7 lists the top institutions contributing to the field, each with at least seven publications. Universiti Teknologi MARA (Malaysia) leads with 20 publications (3.31%), reflecting its strong research focus. Indiana University-Purdue University Indianapolis (14 publications, 2.32%) and Kelley School of Business (13 publications, 2.15%) highlight significant U.S. contributions. Other key contributors include RMIT University (Australia) with 12 publications (1.99%) and Universiti Utara Malaysia and West Virginia University with 10 publications each (1.66%), showcasing Malaysia's prominence and U.S. influence. Ahlia University (Bahrain) and Centro de Estudos Organizacionais e Sociais do Politécnico do Porto (Portugal) follow with 9 publications (1.49%) each, indicating growing activity in the Middle East and Europe. Institutions like the University of South Africa, Instituto Politécnico do Porto, Universidade de Aveiro (Portugal), and The University of Sydney (Australia) each contributed 8 publications (1.32%), with Macquarie University, Monash University (Australia), and the University of Pretoria (South Africa) adding 7 publications (1.16%) each.

The data underscores Malaysia's and the U.S.'s leadership, with growing contributions from Europe, Australia, the Middle East, and Africa, reflecting global collaboration and interest. Expanding international partnerships could further enhance research outputs and impact.

Table 7: Most productive institutions with a minimum of seven publications

Affiliation	Total Publications (TP)	%
Universiti Teknologi MARA	20	3.31%
Indiana University-Purdue University Indianapolis	14	2.32%
Kelley School of Business	13	2.15%
RMIT University	12	1.99%
Universiti Utara Malaysia	10	1.66%
West Virginia University	10	1.66%
Ahlia University	9	1.49%

Centro de Estudos Organizacionais e Sociais do Politécnico do Porto	9	1.49%
University of South Africa	8	1.32%
Instituto Politécnico do Porto	8	1.32%
Universidade de Aveiro	8	1.32%
The University of Sydney	8	1.32%
Macquarie University	7	1.16%
Monash University	7	1.16%
University of Pretoria	7	1.16%

Publications by Countries

The global distribution of research shows the United States leading with 126 publications (20.86%), reflecting its dominant role in the field. Australia follows with 72 publications (11.92%), highlighting Oceania's engagement. Asia emerges strongly with countries like Indonesia, Malaysia, and the United Kingdom contributing 42 publications each (6.95%), alongside China (32, 5.30%) and others such as Jordan (14, 2.32%) and Bahrain (13, 2.15%). Europe makes significant contributions, led by the United Kingdom (42, 6.95%), Portugal (24, 3.97%), and Spain (14, 2.32%). In Africa, South Africa leads with 33 publications (5.46%), while Brazil represents South America with 11 (1.82%). Oceania also sees New Zealand contributing 20 publications (3.31%). This data underscores the United States' leadership while highlighting growing contributions from Asia, Europe, and Oceania. Emerging regions like Africa and South America signal increasing global collaboration and diversification in technology and education research.

Table 8: Top Countries contributed to the publications with a minimum of seven publications

Country	Continent	Total Publication	%
United States	North America	126	20.86%
Australia	Oceania	72	11.92%
Indonesia	Asia	42	6.95%
Malaysia	Asia	42	6.95%
United Kingdom	Europe	42	6.95%
South Africa	Africa	33	5.46%
China	Asia	32	5.30%
Portugal	Europe	24	3.97%
New Zealand	Oceania	20	3.31%
Jordan	Asia	14	2.32%
Spain	Europe	14	2.32%
Bahrain	Asia	13	2.15%
Saudi Arabia	Asia	12	1.99%
Brazil	South America	11	1.82%
Canada	North America	9	1.49%
Germany	Europe	9	1.49%
Egypt	Africa	8	1.32%
India	Asia	8	1.32%
Poland	Europe	8	1.32%
Oman	Asia	7	1.16%
Romania	Europe	7	1.16%

Publications by Source Titles

Table 9 lists key sources in accounting education research, led by Accounting Education (58 publications, 1308 citations) and Journal of Accounting Education (53 publications, 1847 citations). Both demonstrate significant academic impact, with Accounting Education showing strong metrics (CiteScore 8, SJR 0.905). Other contributors include the Journal of Education for Business (12 publications, 174 citations) and Issues in Accounting Education (12 publications, 114 citations), emphasizing the educational aspects of the field. The Journal of Emerging Technologies in Accounting (11 publications, 213 citations) focuses on technology integration, supported by solid impact metrics (CiteScore 4.3, SJR 0.559). Specialized journals like Advances in Accounting Education (10 publications) and Pacific Accounting Review (8 publications) add valuable insights.

Conference proceedings, including the ACM International Conference Proceeding Series and Lecture Notes in Networks and Systems (9 publications each), highlight technological engagement, albeit with lower citation impacts. High-impact journals like Meditari Accountancy Research (7 publications, 91 citations, CiteScore 7.8) and Accounting Research Journal (8 publications, 151 citations, CiteScore 5) stand out, while multidisciplinary sources like Education Sciences and Springer Proceedings in Business and Economics reflect cross-disciplinary relevance. This data underscores the dominance of specialized journals, the growing role of technology-focused sources, and the importance of diverse publication venues in advancing interdisciplinary research and collaboration.

Table 9: Most active source titles

Source Title	TP	TC	Publisher	Cite Score	SJR 2020	SNIP 2020
Accounting Education	58	1308	Taylor & Francis	8	0.905	2.263
Journal of Accounting Education	53	1847	Elsevier	4.2	0.413	1.491
Journal of Education for Business	12	174	Taylor & Francis	3.1	0.445	0.88
Issues in Accounting Education	12	114	American Accounting Association	2.6	0.421	0.871
Journal of Emerging Technologies in Accounting	11	213	American Accounting Association	4.3	0.559	1.021
Advances in Accounting Education: Teaching and Curriculum Innovations	10	60	Emerald Publishing	1.2	0.103	0
ACM International Conference Proceeding Series	9	11	N/A	1.5	0.253	0.233
Lecture Notes in Networks and Systems	9	3	Springer Nature	0.9	0.171	0.282
Communications in Computer and Information Science	8	28	Springer Nature	1.1	0.203	0.246
Pacific Accounting Review	8	98	Emerald Publishing	3.8	0.436	1.077
Accounting Research Journal	8	151	Emerald Publishing	5	0.425	0.938
Springer Proceedings in Business and Economics	7	7	N/A	0.7	0.151	0.14
Meditari Accountancy Research	7	91	Emerald Publishing	7.8	0.932	1.323
Journal of Physics: Conference Series	6	18	N/A	1.2	0.18	0.303
AIP Conference Proceedings	6	5	N/A	0.5	0.152	0.291
Advances in Intelligent Systems and Computing	5	2	Springer Nature	N/A	N/A	N/A
Studies in Systems, Decision and Control	5	5	Springer Nature	1.6	0.116	0
International Journal of Phytoremediation	4	59	Taylor & Francis	7.6	0.715	0.862
Education Sciences	4	49	Multidisciplinary Digital Publishing Institute (MDPI)	4.8	0.669	1.323
Iberian Conference on Information Systems and Technologies, CISTI	4	4	N/A	N/A	N/A	N/A

Notes: TP=total number of publications; TC=total citations; CiteScore = average citations received per document published in the source title; SJR = SCImago Journal Rank measures weighted citations received by the source title; SNIP = source normalized impact per paper measures actual citations received relative to citations expected for the source title's subject field.

Citation Metrics

Table 10 summarizes key citation metrics from 1984 to 2024, covering 604 publications with 6801 citations—an average of 170.03 citations per year and 11.26 per paper. A high h-index of 43 and a g-index of 62 underscore the influence of top-cited works, with 43 papers receiving at least 43 citations. Collaboration is moderate, with an average of 2.53 authors per paper, though citations per author (4.45) suggest individual contributions are spread across many works. These metrics reflect a growing, impactful, and collaborative research field, with strong citation averages indicating the relevance of outputs and a solid foundation for continued growth.

Table 10: Citations metrics

Metrics	Data
Publication years	1984 - 2024
Total Publications	604
Number of Citations	6801
Years	41
Citations per Year	170.03
Citations per Paper	11.26
Citations per Author	4.45
Authors per Paper	2.53
h-index	43
g-index	62

Highly Cited Documents

Table 11 highlights the top 20 highly cited articles in accounting education research, showcasing significant contributions and evolving priorities. Howieson (2003) leads with 173 citations, addressing accounting education's readiness for 21st-century challenges. Influential works include Watty et al. (2016) and Sledgianowski et al. (2017), with 136 and 132 citations, respectively, focusing on faculty resistance to technology and integrating Big Data into the curriculum. Recent impactful studies, such as Damerji and Salimi (2021) and Qasim and Kharbat (2020), emphasize AI, blockchain, and analytics in education, with high citation rates (26.50 CPY and 21.80 CPY). Key themes include technology integration, curriculum reforms, and pedagogical innovation. Studies like Dzuranin et al. (2018) and Dolce et al. (2020) explore aligning education with industry needs and addressing skill gaps, while Stanley and Marsden (2012) advocate for innovative teaching methods. Foundational works by Rebele et al. (1998) and Apostolou et al. (2010) continue to shape the field. Global studies, such as Awayiga et al. (2010) in Ghana and Moorthy et al. (2019) in Malaysia, highlight the adaptability and international relevance of the research. These articles demonstrate the field's responsiveness to challenges, commitment to innovation, and lasting impact on academia and practice.

Table 11: Top 20 highly cited articles

No.	Authors	Title	Source Title	Cites	Cites per Year
1	Howieson B. (2003)	Accounting practice in the new millennium: Is accounting education ready to meet the challenge?	British Accounting Review	173	7.86
2	Watty K.; McKay J.; Ngo L. (2016)	Innovators or inhibitors? Accounting faculty resistance to new educational technologies in higher education	Journal of Accounting Education	136	15.11
3	Sledgianowski D.; Gomaa M.; Tan C. (2017)	Toward integration of Big Data, technology and information systems competencies into the accounting curriculum	Journal of Accounting Education	132	16.50
4	Pincus K.V.; Stout D.E.; Sorensen J.E.; Stocks K.D.; Lawson R.A. (2017)	Forces for change in higher education and implications for the accounting academy	Journal of Accounting Education	116	14.50

5	Qasim A.; Kharbat F.F. (2020)	Blockchain technology, business data analytics, and artificial intelligence: Use in the accounting profession and ideas for inclusion into the accounting curriculum	Journal of Emerging Technologies in Accounting	109	21.80
6	Apostolou B.; Dorminey J.W.; Hassell J.M.; Watson S.F. (2013)	Accounting education literature review (2010-2012)	Journal of Accounting Education	108	9.00
7	Damerji H.; Salimi A. (2021)	The mediating effect of use perceptions on technology readiness and adoption of artificial intelligence in accounting	Accounting Education	106	26.50
8	Moorthy K.; Yee T.T.; T'ing L.C.; Kumaran V.V. (2019)	Habit and hedonic motivation are the strongest influences in mobile learning behaviors among higher education students in Malaysia	Australasian Journal of Educational Technology	100	16.67
9	Mohamed E.K.A.; Lashine S.H. (2003)	Accounting knowledge and skills and the challenges of a global business environment	Managerial Finance	97	4.41
10	Dzuranin A.C.; Jones J.R.; Olvera R.M. (2018)	Infusing data analytics into the accounting curriculum: A framework and insights from faculty	Journal of Accounting Education	95	13.57
11	Dolce V.; Emanuel F.; Cisi M.; Ghislieri C. (2020)	The soft skills of accounting graduates: perceptions versus expectations	Accounting Education	94	18.80
12	de Lange P.; Suwardy T.; Mavondo F. (2003)	Integrating a virtual learning environment into an introductory accounting course: Determinants of student motivation	Accounting Education	91	4.14
13	Alshurafat H.; Al Shbail M.O.; Masadeh W.M.; Dahmash F.; Al-Msiedeen J.M. (2021)	Factors affecting online accounting education during the COVID-19 pandemic: an integrated perspective of social capital theory, the theory of reasoned action and the technology acceptance model	Education and Information Technologies	86	21.50
14	Palmer K.N.; Ziegenfuss D.E.; Pinsker R.E. (2004)	International knowledge, skills, and abilities of auditors/accountants: Evidence from recent competency studies	Managerial Auditing Journal	82	3.90
15	Apostolou B.; Hassell J.M.; Rebele J.E.; Watson S.F. (2010)	Accounting education literature review (2006-2009)	Journal of Accounting Education	82	5.47
16	Watson S.F.; Apostolou B.; Hassell J.M.; Webber S.A. (2007)	Accounting education literature review (2003-2005)	Journal of Accounting Education	80	4.44
17	Rebele J.E.; Apostolou B.A.; Buckless F.A.; Hassell J.M.; Paquette L.R.; Stout D.E. (1998)	Accounting education literature review (1991-1997), part II: Students, educational technology, assessment, and faculty issues	Journal of Accounting Education	80	2.96
18	Al-Htaybat K.; von Alberti-Alhtaybat L.; Alhatabat Z. (2018)	Educating digital natives for the future: accounting educators' evaluation of the accounting curriculum	Accounting Education	78	11.14

19	Apostolou B.; Dorminey J.W.; Hassell J.M.; Rebele J.E. (2015)	Accounting education literature review (2013-2014)	Journal of Accounting Education	75	7.50
20	Musleh Al-Sartawi A.M.A. (2020)	E-Learning Improves Accounting Education: Case of the Higher Education Sector of Bahrain	Lecture Notes in Business Information Processing	70	14.00
21	Stanley T.; Marsden S. (2012)	Problem-based learning: Does accounting education need it?	Journal of Accounting Education	70	5.38
22	Awayiga J.Y.; Onumah J.M.; Tsamenyi M. (2010)	Knowledge and skills development of accounting graduates: The perceptions of graduates and employers in Ghana	Accounting Education	70	4.67

Top Keywords

Table 12 highlights key themes in accounting education research through top author keywords. "Accounting education" dominates with 204 mentions (7.89%), reflecting its central role, followed by "Accounting" (57, 2.20%), indicating the foundational relevance of the discipline. Keywords like "Higher education" (1.12%), "E-learning" (1.01%), and "Artificial intelligence" (0.93%) show growing interest in technology integration, while terms such as "COVID-19" (0.81%) and "Online learning" (0.54%) highlight shifts in education delivery during the pandemic. Technological focus is evident with "Technology" (0.89%), "Information technology" (0.81%), and "Data analytics" (0.58%), reflecting alignment with industry demands. Other terms like "Accounting curriculum" (0.58%), "Skills" (0.43%), and "Accounting profession" (0.58%) emphasize the connection between education and professional readiness. Broader themes like "Educational technology" (0.70%) and "Learning" (0.46%) underscore the focus on pedagogy and innovation. These keywords illustrate a dynamic research landscape, blending technology, curriculum alignment, and adaptability to evolving educational and industry needs.

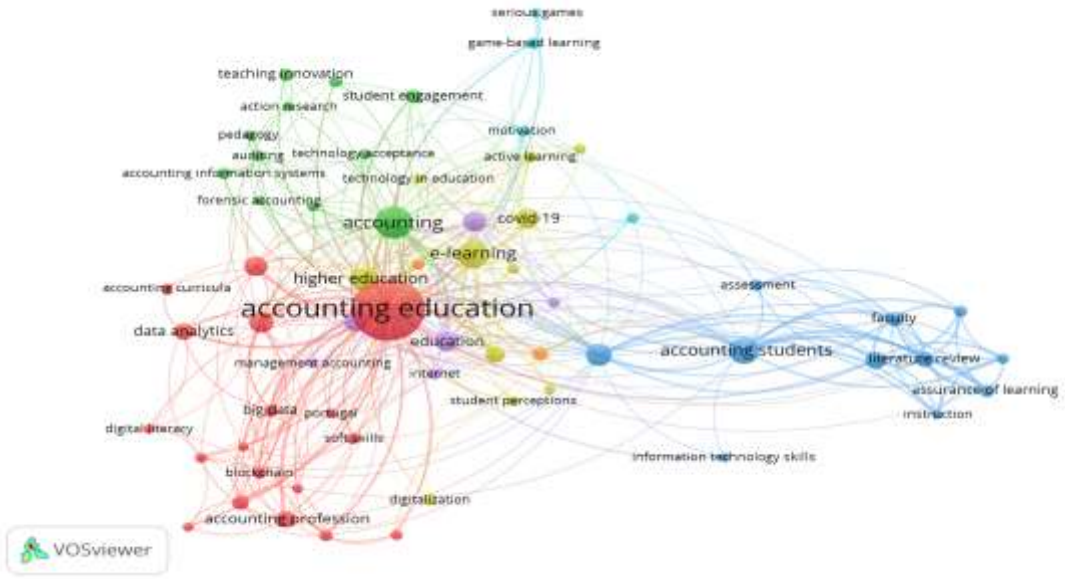
Table 12: Top author's keywords

Author Keywords	Total Publications (TP)	Percentage (%)
Accounting education	204	7.89%
Accounting	57	2.20%
Higher education	29	1.12%
E-learning	26	1.01%
Artificial intelligence	24	0.93%
Technology	23	0.89%
Education	21	0.81%
Information technology	21	0.81%
COVID-19	21	0.81%
Educational technology	18	0.70%
Students	17	0.66%
Blended learning	16	0.62%
Accounting curriculum	15	0.58%
Data Analytics	15	0.58%
Accounting students	15	0.58%
Accounting profession	15	0.58%
Literature review	14	0.54%
Online learning	14	0.54%
Learning	12	0.46%
Skills	11	0.43%

Co-occurrence Analysis of Author Keywords

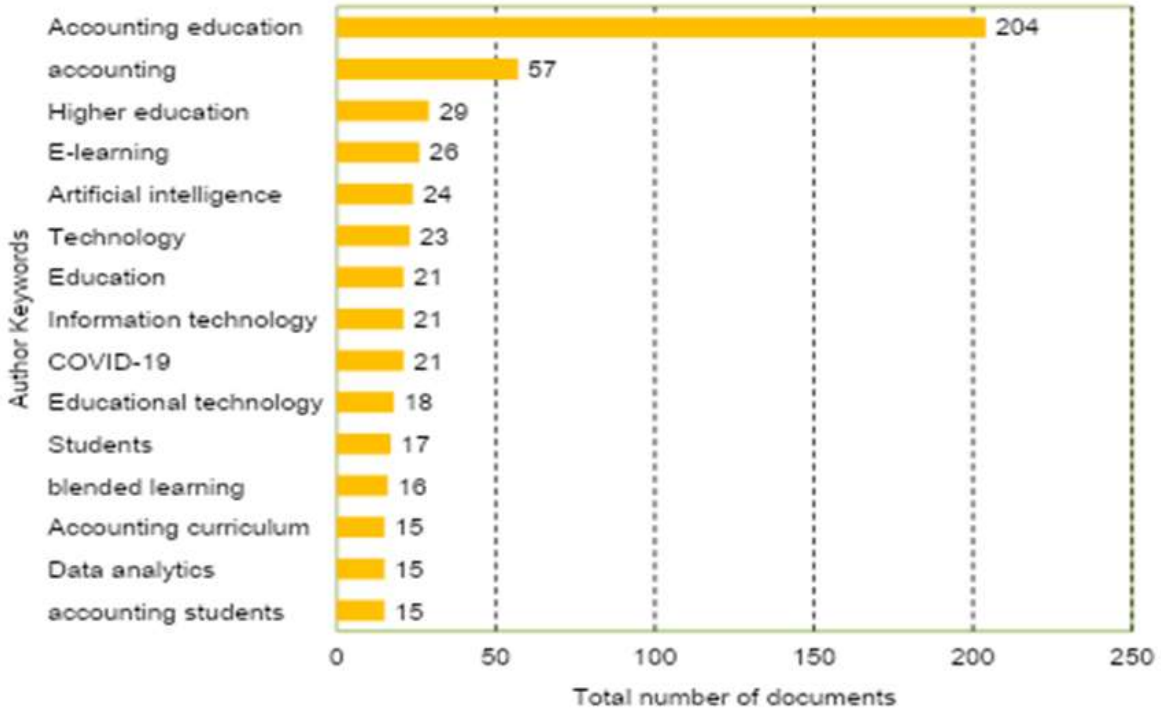
Figure 3 visualizes thematic relationships in accounting education research through a VOSviewer keyword network, with "Accounting Education" at its center, highlighting its foundational role. The network is divided into clusters representing key themes. The red cluster focuses on technology and professional skills, featuring keywords such as "accounting curricula," "data analytics," and "blockchain," which emphasize aligning education with industry demands. The green cluster highlights pedagogy and innovation, with terms like "student engagement" and "teaching innovation" aimed at enhancing learning effectiveness. The blue cluster centers on student-focused research, exploring "accounting students," "assessment," and learning outcomes, while the yellow cluster reflects e-learning and online education, incorporating terms like "COVID-19" and "active learning" to address shifts in education delivery during the pandemic. Strong connections between keywords like "data analytics," "blockchain," and "digital literacy" underscore the role of technology in preparing students for modern professional challenges. Emerging areas such as "serious games," "game-based learning," and "soft skills" highlight niche but growing interests. Overall, the network reveals a dynamic and interconnected research landscape, balancing established themes like curriculum development with newer trends, such as gamification and the impact of COVID-19 on education, while identifying opportunities for further exploration in underdeveloped areas like soft skills and innovative teaching strategies.

Figure 3: Network visualization of the authors' keywords



The bar chart in Figure 4 shows the frequency distribution of the top 15 keywords in accounting education research, reflecting central themes and trends. "Accounting Education" leads with 204 mentions, underscoring its foundational role, followed by "Accounting" (57), emphasizing the core subject. "Higher Education" (29) and "E-learning" (26) highlight the growing importance of digital and broader educational contexts. Technological themes include "Artificial Intelligence" (24), "Technology" (23), and "Information Technology" (21), emphasizing the integration of advanced tools to meet industry demands. "Educational Technology" (18) and "COVID-19" (21) reflect shifts toward online and hybrid learning due to global disruptions. Student-focused themes like "Students" (17), "Blended Learning" (16), and "Accounting Students" (15) highlight engagement and hybrid models, while "Accounting Curriculum" (15) and "Data Analytics" (15) emphasize aligning education with industry needs. The chart underscores the field's dynamic nature, with a focus on technology, curriculum development, and adaptability to contemporary challenges like COVID-19, ensuring relevance in a rapidly evolving profession.

Figure 4: Frequency Distribution of Top 15 Author Keywords



5. Conclusion and Recommendations

The evolution of technology in accounting education has fundamentally transformed the teaching and learning landscape, as demonstrated by this bibliometric analysis. Advanced tools such as artificial intelligence, blockchain, and data analytics have reshaped traditional pedagogical methods, fostering innovative practices like virtual simulations, gamification, and adaptive learning platforms. These advancements have significantly improved student engagement, critical thinking, and practical skill development, aligning educational outcomes with the demands of a technology-driven accounting profession. This study, while comprehensive, is not without its limitations. The reliance on the Scopus database may have excluded relevant contributions from other sources, potentially limiting the breadth of the analysis. The focus on publications from 1984 to 2024 might not fully capture the latest trends, particularly those from 2024 that have yet to accrue significant citation impact. Moreover, the predominance of English-language publications risks omitting valuable insights from non-English-speaking regions. The emphasis on quantitative metrics, such as publication counts and citations, may also overlook qualitative aspects, such as the real-world effectiveness of technological tools in accounting education. Additionally, the study does not extensively explore regional variations in technology adoption or the nuanced impacts of specific tools like AI or blockchain on education outcomes. The absence of longitudinal data and practitioner perspectives further limits insights into the long-term impacts of technology-driven education and its alignment with industry needs.

Despite these limitations, the findings emphasize the transformative potential of technology in accounting education and highlight critical areas for future research. Addressing these gaps through longitudinal and interdisciplinary studies, and by incorporating insights from diverse regions and stakeholders, will ensure a more holistic understanding of the field. By fostering collaboration among educators, policymakers, and industry leaders, accounting education can continue to innovate and adapt. Ultimately, the integration of technology offers a roadmap to prepare students not only for the complexities of the modern accounting profession but also for leadership in an increasingly digitized and interconnected world.

The journal article could be improved by emphasizing the global importance of technology in accounting education, discussing regional contributions, disparities, and international collaborations. A section on research gaps, such as the long-term effects of technology-driven education and comparisons across diverse

contexts, would clarify underexplored areas. Including case studies of institutions using AI, blockchain, or data analytics would add practical insights. The article should address challenges like the digital divide, resistance to change, and technological obsolescence, with solutions such as professional development and better technology access. Adding visuals like graphs and trend charts would improve readability. Clear policy recommendations, including faculty training and equitable technology access, should be outlined. Using frameworks like the Technology Acceptance Model (TAM) would provide insights into technology adoption. Encouraging collaboration across institutions and proposing future research on emerging technologies like generative AI would enhance the article's value for academia, industry, and policymakers.

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