

Trends in Digital and Critical Thinking Skills Research in Millennials Accountant Profession: A Bibliometric Analysis

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Abstract: The accounting profession faces numerous challenges in the era of digitalization. With the constant evolution of technology, the skill of critical thinking is becoming increasingly valuable. Accounting professionals are responsible for making critical choices using financial data, predictions, and analytical techniques. The capacity for critical thinking is of utmost importance in the digital age due to the abundance and complexity of data. Therefore, this paper aims to analyze the trends in articles published on digital and critical thinking skills in the millennial accountant profession by using bibliometric analysis and VOS viewer software. The data were collected from the Scopus database from 2014 to February 2024, with 456 published papers with the keywords "Millennial", "accountant profession", "digital skills", and "critical thinking". The finding shows that higher education remains the predominant author keyword in academic writing over the previous decade, with accounting education ranking second rather than critical thinking abilities. The top ten articles do not directly correspond to the digital and critical thinking abilities of Millennial accountants. This study contributes to the literature on the Millennial accountant profession by providing interdisciplinary approaches incorporating technology-enhanced learning methods, case studies, and real-world simulations to develop holistic skill sets among aspiring accountants.

Keywords: *Digital skills, critical thinking skills, accountant profession, Millennial, bibliometric analysis.*

1. Introduction

The outlook for accounting professionals is often closely linked to the economic well-being of a country. When the economy improves, there is typically an increased demand for accountants, auditors, and other financial professionals to handle and oversee financial records. Globalization heightened regulations, digital innovation, international tension, and an unprecedented pandemic will impact the demand for accountants in the future. It is crucial for accountants belonging to the Millennial generation to possess essential skills like critical thinking and digital skills to meet the current demand effectively. The role of Millennial professionals in the accounting field is set to undergo a significant transformation as they are increasingly recognized for their expertise and contributions. This shift will elevate their position within organizations and open new avenues for them to create value (Noor et al., 2021). The changes are moving towards using information and communication technologies in their professional activities, which include reporting and changing their function to add artificial intelligence to accounting operations (Noor et al., 2021; Gulin et al., 2019). Twenge et al. (2012) state that Millennials were born in the 1980s and 1990s. Millennials are often called the "Digital Natives" because they were born during the peak of the Internet and its associated technologies (Hershatter & Epstein, 2010; Jone et al., 2010).

By looking at the years of birth of millennials in the 1980s and 1990s (Twenge et al., 2012), millennial generations now aged 25 to 42 (Lyon, 2023) are currently dominating the accounting profession. In Malaysia, as of June 2023, only 38,500 accountants registered with the Malaysia Institute of Accountants (MIA), serving 33.2 million of Malaysia's population (Poo, 2023). This means that one (1) accountant will serve approximately 874 people, with a ratio of 1:871 compared to 1:1,342 in 2003 for the number of accountants registered with MIA (Poo, 2023). The ratio indicates Malaysia is still left behind, although the ratio has been reduced. However, it is essential to note that based on the data in 2014 from the Committee to Strengthen the Accountancy Profession (CSAP), other countries like Australia have an accountant serving per population ratio of 1:119, Singapore 1:184, New Zealand 1:136, and Hong Kong, 1:195 (Poo, 2023). While the specific data for Malaysia in 2023 may not directly align with the current situation in Australia, Singapore, New Zealand, and Hong Kong, it nonetheless provides valuable insights into the ongoing disparities in accountant-to-population ratios across different countries, given Malaysia's smaller size compared to these countries.

When the number of accountants serving the population is high in Malaysia compared to other countries, the provision of financial services may be negatively impacted and result in errors, oversights, and a decline in service standards. Furthermore, there may be challenges in delivering financial services, processing transactions, and meeting regulatory obligations, which could affect the speed and effectiveness of economic decision-making and risk management practices. Hence, it affects issues of ethics, trust, and working for the public when handling the finances of large and small companies (Association of Chartered Certified Accountants, 2012). Furthermore, the ACCA Report 2022 on the Developing the Skills of the Sustainable Business and Finance Professionals identified the seven core capabilities required by all professional accountants: expertise, ethics, insight, sustainability, collaboration, digital and drive. Among the seven cores, critical thinking is crucial in gaining insight as a core career navigator, while digital literacy stands out as a key core component (Machado, 2022). Maintaining the accountant capabilities required by employers could pose a challenge when serving a large population.

This has motivated the study of the Millennial accountant profession, focusing on digital and critical thinking skills. Technology is impacting both Millennial accountants' competencies and mindsets. Using technology in the finance function creates an 'intelligence augmentation' model, where technology augments human intelligence (Chartered Global Management Accountant, 2018). Millennial accountants must understand what they want from their interactions with technology. Future professional accountants must create and understand a corresponding need for humans to retain appropriate spheres of control and influence the environment within which these human-machine interactions occur (Association of Chartered Certified Accountants, 2018). As technology continues to reshape the profession, the ability to think critically becomes increasingly valuable. Accountants make crucial decisions based on financial data, forecasts, and analyses. In the digital era, where data is abundant and complex, thinking critically is paramount (Louwers et al., 2017). As such, this study aims to support the accountancy profession, which will evolve significantly over the next period, by giving direction and highlighting the drivers expected to exert the most influence on the profession. Based on our analysis, up to this research date, using the Scopus database, limited research is being conducted about millennial accountants using bibliometric analysis that focuses on digital and critical thinking skills.

The current literature with bibliometric analysis focused on a wide range of areas such as digital labor (Goel et al., 2023), metaverse chronicles (Wider et al., 2023), virtual reality in the health sector (Pawassar & Tiberius, 2021), big data analytics (Aboelmaged & Mouakket, 2020) and Blockchain in auditing and accounting (Silva et al., 2022; Secinaro et al., 2021). Others examined finance and economics (Uyob et al., 2019; Thiemann & Priester, 2024; Munodei & Sibindi, 2023) and public-sector accounting (Bruns et al., 2020). While Uyob et al. (2019) analyzed business reporting language (XBRL), Munodei and Sibindi (2023) elucidated the emerging areas surrounding fintech in social protection. In addition, Theimann and Priester (2024) revealed how a structural rapprochement between macroeconomics and finance created a new subfield of microfinance. From the above discussion, it is evident that numerous studies have examined several facets of bibliometric analysis in the accounting area. Still, the studies have not specifically focused on Millennial accountants by focusing on digital and critical thinking skills. As such, we plan to fill this research gap by identifying the relevant variables that can be examined in the Scopus database. Therefore, this study aims to perform a bibliometric analysis of the currently published articles on digital and critical thinking skills in the millennial accountant profession in new research trends and future directions and critique the research underlying these topics.

This study focuses on publications from 2014 to February 2024 and is confined to those in the Scopus database. The study has four research questions (RQs) as follows:

RQ1. What are the main themes or topics represented by the authors' keywords in the literature?

RQ2. Which articles are most frequently cited in the literature?

RQ3. Which authors have the highest impact with cumulative citation counts?

RQ4. Which journals have the highest publication rates on digital and critical thinking skills for millennial accountants?

This research makes several contributions to the existing body of literature. In the first place, determining the keywords used by the author will provide valuable insights about the current or repeating theme focus on the accounting profession among Millennials and whether or not the topics mirror the practical work environment employers require. As a result, this will encourage future research to focus on subjects the business anticipates

accounting graduates to be knowledgeable about. Secondly, the benefit of knowing which publications are cited the most frequently and which writers have a significant impact is that it enables the researcher to evaluate the impact of their work and determine the path the research will take. In addition, it helps researchers assess the visibility and significance of individual papers and journals, and it makes it easier for them to make informed decisions regarding allocation, chances for collaboration, and publication strategies. Finally, selecting a reputable journal will guarantee that the results of the research publication can be utilized effectively by society and policymakers who are pertinent to the issue. Thus, the paper is structured as follows: Section 2 describes the literature review on digital and critical thinking skills, and Section 3 describes the research methodology. Section 4 presents the results of the bibliometric analysis. Finally, Section 5 summarises the results, conclusions, limitations, and opportunities for future research.

2. Literature Review

The overwhelming amount of literature available in a specific research discipline makes it challenging for researchers to have a structured overview of relevant information (Rodrigues et al., 2014; Zhou et al., 2015). Bibliometric analysis is a technique that makes it possible to provide a macroscopic overview of large amounts of academic literature and analyze them from a quantitative perspective (Merigo et al., 2015). The analysis gives insights into research areas by revealing detailed information (Spilker et al., 2016) about the collection of publications from specific databases such as publication type, location of publication, h-index, authors, keywords frequency and the number of citations (Ahmi & Mohd Nasir, 2019). The bibliometric analysis on innovative systems looks at 3250 documents from the Web of Science database released between 1988 and 2018 to get an overview of how innovation systems have changed and grown over time and to find new research topics (Dahesh et al., 2020).

The study on Millennial accountant profession up to this research date, supported by bibliometric analysis, covers various topics including digital labor, metaverse chronicles, virtual reality in the health sector, big data analytics, and Blockchain in auditing and accounting (Goel et al., 2023; Wider et al., 2023; Pawassar & Tiberius, 2021; Aboelmaged & Mouakket, 2020; Silva et al., 2022; Secinaro et al., 2021). Other studies have focused on finance and economics (Uyob et al., 2019; Thiemann & Priester, 2024; Munodei & Sibindi, 2023) as well as public sector accounting (Bruns et al., 2020). In a recent study, Uyob et al. (2019) examined the language used in business reporting, specifically XBRL. Meanwhile, Munodei and Sibindi (2023) shed light on the growing areas of interest in fintech within the realm of social protection. Furthermore, Theimann and Priester (2024) uncovered the emergence of a new subfield of microfinance resulting from a structural convergence between macroeconomics and finance. Hence, this study focuses on digital skills and critical thinking skills as it was among the seven core capabilities mentioned in 2022 in the ACCA Report, *Developing the Skills of the Sustainable Business and Finance Professionals*: expertise (1), ethics (2), insight (3), sustainability (4), collaboration (5), digital (6) and drive (7). Out of the seven cores, critical thinking is essential for gaining insight into core accountant career navigator, while digital literacy is a standout component core.

Digital Skill: The Report from The Youth Digital Skills Indicator claims that digital skills are the ability to engage with information and communication technologies (ICT) to facilitate productive outcomes in daily activities for themselves and others (Helsper et al., 2020). Professional accountants often need to gain the necessary skills in digital technologies, a crucial area of expertise (Association of Chartered Certified Accountants, 2016). The term for information and technology skills is also being used for computer literacy, digital competence, and many others (Zainuddin et al., 2021). Millennial accountants need to have an explicit knowledge of what they anticipate from technology to be successful in their careers. Because of the necessity of retaining control and influence over the environment in which human-machine interactions take place, it is essential for individuals who are interested in becoming accountants to be aware of this fact (Association of Chartered Certified Accountants, 2016).

Ibrahim et al. (2021) highlight an increased demand for IT professionals with accounting experience, as opposed to traditional accounting majors. This finding suggests that millennials entering the accounting profession may need to enhance their IT skills and technical knowledge to meet the demands of the evolving industry. These technologies can transform the accounting profession by automating repetitive tasks, improving data analysis and decision-making capabilities, reducing the risk of errors and fraud, and enhancing

accounting processes' overall efficiency and productivity (Zhang et al., 2020). The study also highlights the potential impact of blockchain technology on the accounting profession to increase transparency, improve security, and streamline auditing processes. These will require a shift in the skills and capabilities of accounting graduates (Ibrahim et al., 2021).

They will need a strong foundation in information technology and the ability to adapt to new technologies quickly (Damasiotis et al., 2015). However, research also indicates that millennials possess strong digital literacy skills and are adept at navigating various digital tools and platforms (Tran, 2018). Their familiarity with technology allows them to demonstrate proficiency in using accounting software, data analytics tools, and cloud-based platforms for financial analysis and reporting (Morrison et al., 2020). Moreover, millennials prefer technology-driven communication and collaboration methods that facilitate greater flexibility and connectivity in the workplace (Nguyen et al., 2020). Recognizing the importance of nurturing the latest sets of skills is crucial for the future of the accountant profession, as accounting firms and organizations can empower millennial accountants to navigate complexities, drive innovation, and uphold professional standards in the digital era.

Critical Thinking Skill: In today's digital age, the accounting field is experiencing significant transformations. Advancements in technology, such as big data, artificial intelligence, machine learning, and Blockchain, are revolutionizing how accountants work and provide value to their clients (Kupenova et al., 2020). These technological developments have sparked a growing interest in researching the trends and impact of these changes on millennials in the accounting profession. Amidst these changes, critical thinking remains an indispensable skill for accountants (Paul & Elder, 2006). Critical thinking encompasses analytical reasoning, problem-solving, and decision-making skills essential for effective accounting practices (Ridgway et al., 2019). It underpins effective decision-making, problem-solving, and ethical considerations in accounting. However, studies indicate that some millennials may need more robust critical thinking skills, particularly in areas requiring complex analysis and strategic decision-making (Allen & Debevec, 2021). Critical thinking enables accountants to evaluate the data's relevance, accuracy, and reliability. They must discern patterns, identify outliers, and interpret trends effectively to make informed decisions.

By critically analyzing financial information, accountants can mitigate risks, optimize resource allocation, and drive organizational growth. Moreover, critical thinking empowers accountants to assess the implications of various courses of action (Munter, 2016). They must consider potential outcomes, weigh alternatives, and anticipate future scenarios. Whether it involves investment decisions, budget allocations, or strategic planning, critical thinking enhances the efficacy of decision-making processes in accounting. The ability to think critically allows accountants to adapt swiftly to new challenges and capitalize on emerging opportunities. In addition to decision-making, critical thinking plays a pivotal role in problem-solving for accountants. Complex financial issues often require a systematic and analytical approach. Accountants must dissect problems, identify underlying causes, and formulate viable solutions (Cottrell, 2017). Critical thinking enables them to break down problems into manageable components, facilitating the development of effective strategies.

Furthermore, critical thinking fosters innovation and creativity in problem-solving. Whether it involves streamlining processes, enhancing efficiency, or addressing compliance issues, critical thinking equips accountants with the tools to navigate complexities and deliver value-added solutions. Innovative problem-solving skills are indispensable in the digital era, where disruptive technologies constantly reshape industries. Ethical dilemmas are pervasive in the accounting profession, as accountants often encounter situations where ethical principles conflict with business objectives or societal expectations. Critical thinking enables accountants to navigate ethical grey areas with integrity and discernment (Spilker et al., 2016). They must assess the ethical implications of their actions, considering the interests of stakeholders, regulatory requirements, and professional standards. By harnessing critical thinking skills, accountants can navigate complexities, drive innovation, and uphold ethical standards amidst evolving challenges and opportunities.

Accounting firms and organizations must recognize the importance of nurturing both sets of skills to ensure the readiness of their workforce for the digital age (Rogers et al., 2020). Factors such as educational background, professional development opportunities, and workplace experiences influence the development of critical thinking skills among millennial accountants (Hassan et al., 2021). Institute of higher learning and professional accounting bodies should emphasize interdisciplinary approaches incorporating technology-

enhanced learning methods, case studies, and real-world simulations to develop holistic skillsets among aspiring accountants. This section focused on a literature review of digital and critical thinking skills and provided valuable support for our research methodology. It helped us reduce the Scopus database from 6,527 to 456 articles. To ensure that we only included the most pertinent articles for our study, we narrowed down our search to 56 exact keywords related to the articles mentioned above and research conducted on case studies in Malaysia.

3. Research Methodology

This study uses bibliometric analysis, which enables a comprehensive review of a substantial volume of academic literature and quantitative analysis (Merigo et al., 2015). The research used a combination of the Scopus database for data retrieval and analysis and VOSviewer for network visualization. Scopus database is used in this study as it provides a more comprehensive and accurate understanding of the scholarly landscape across various fields (Meho & Yang, 2007). The first step in gathering bibliographic data is to search for relevant articles about the Millennial accountant profession in the Advanced Scopus database using the following query: *TITLE-ABS-KEY ('millennial' AND 'accountant' AND 'profession') OR ('accounting' AND 'profession') OR ('millennial' AND 'accountant') AND ('critical' AND 'thinking') OR ('digital' AND 'skill') OR ('digital' AND 'literacy')*. This search resulted in a total of 6,527 records being collected.

Next, within the Advanced Search Scopus database, the data were filtered according to the year, covering the period from 2014 to February 2024. Additional filters were applied that include subject areas (Social Sciences, Business, Management and Accounting, Economics, Econometrics, and Finance), document type (article), language (English), keywords, source type (journal), source title, author name, and publication stage (final). The additional filter resulted in the sample size selected being only 456 data. Hence, advanced query in the Scopus resulted as *TITLE-ABS-KEY ('millennial AND accountant AND profession') OR ('accounting AND profession') OR ('millennial AND accountant') AND ('critical AND thinking') OR ('digital AND skill') OR ('digital AND literacy') AND PUBYEAR > 2013 AND PUBYEAR < 2025 AND (LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "ECON")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (EXACTKEYWORD , "Accounting Education"))*.

Other than *accounting education* as the EXACT KEYWORD, 56 keywords were being entered in the TITLE-ABS-KEY. The keyword is *Higher Education, Accounting, Learning, Critical Thinking, Accountability, Big Data, COVID-19, Gender, Students, Data Analytics, Innovation, Technology, Management Accounting, Management, E-learning, Accounting Profession, Soft Skills, Qualitative Research, Technology Adoption, Social Media, Communication, Leadership, Digitalization, Digital Transformation, Blockchain, Skills, Employability, Competencies, Governance, Forensic Accounting, Decision-making, Malaysia, Workplace, Industry 4.0, Attitude, Skill, Information Technology, Information Systems, Big Data Analytics, Training, Job Satisfaction, Professional Competence, Personnel, Occupation, Digital Technologies, Automation, Commerce, Professional Ethics, Professional Identity, Knowledge Management, Labor Market, Corporate Governance, Business Education, Employment and Artificial Intelligence*.

To ensure the articles are extracted from reliable data, the *exact KEYWORDS* chosen are based on research conducted in Malaysia case studies with companies that were awarded the Best Employer and Most Attractive Graduate Employers to Work in recent years (Ibrahim et al., 2021). The findings from the case studies show the need for accounting graduates to have skills in technical skills, soft skills, data analytics and interpersonal skills in the workplace (Ahmad et al., 2022). There is a digital transformation of the accounting profession in the post-COVID-19 pandemic to emphasize the importance of digital and critical thinking skills to ensure the relevancy of the profession in becoming future-fit accountants (Zainuddin et al., 2021); accountants in the modern era are actively engaged in technology, as their work primarily involves working with systems and software. They must equip themselves with the necessary skills, such as critical skills, to keep up with technological advancements and maintain competitiveness in the current business (Zainuddin et al., 2023). The final step is exporting the articles and bibliographic information to CSV files and finally importing the CSV files into VOSviewer for network visualization and further analysis in meeting the objective of this study on authors' keywords, articles frequently cited authors with high cumulative citation and journal with highest publication rates.

4. Findings and Discussion

Author Keywords Occurrence: Table 1 presents the top ten author keywords used by researchers when studying the digital and critical thinking skills of Millennial accountants, including frequency of occurrences and clustering patterns. The finding, as shown in Table 1, aims to assess the *RQ1* in identifying thematic significance within the existing body of literature. Figure 1 shows the relationship in the interconnection between the keywords in the form of network visualization generated by VOSviewer software.

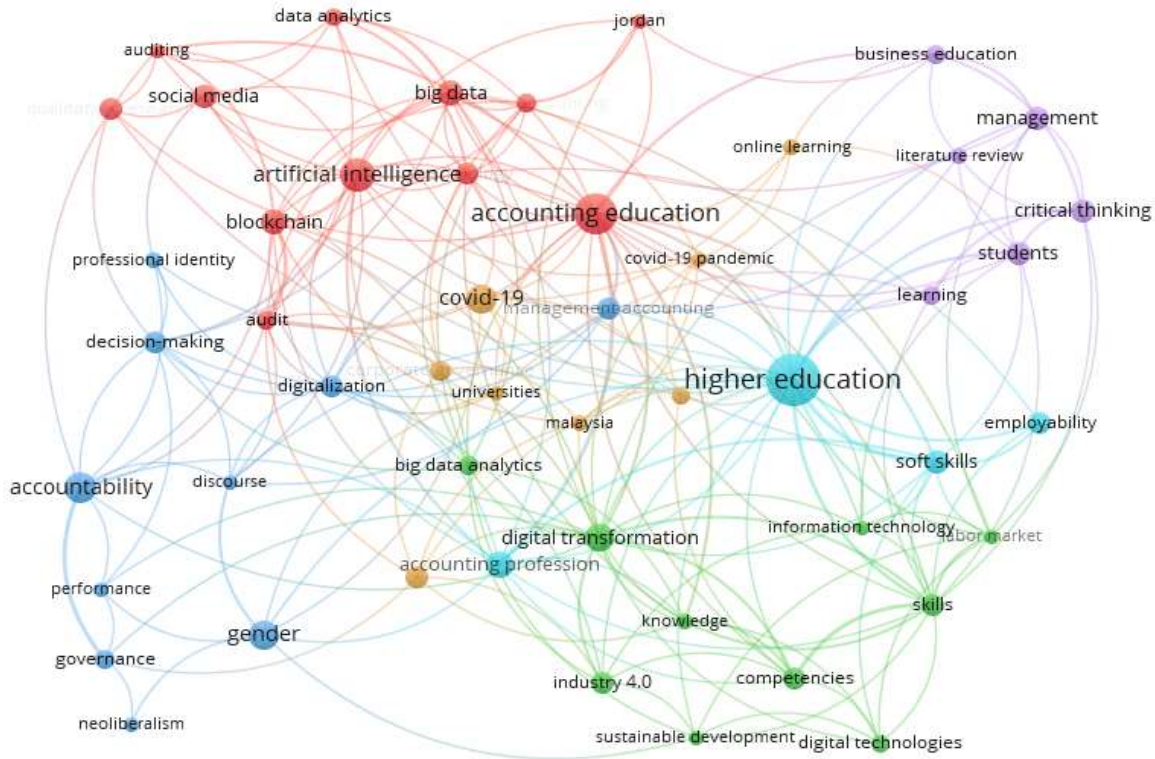
Higher education is the frequently used keyword. Meanwhile, keywords like *Artificial intelligence*, *digital transformation*, *Blockchain*, and *Big data* represent digital skills required by employers. These terms imply how technology affects accounting, specifically Millennials' digital and critical thinking skills. Other keywords include *accounting education*, *accountability*, *gender*, and *the accounting profession*. *The accounting profession*, as the main variable in this study, is not formed as the main author's keyword. In addition, *Critical thinking* appears as one of the least-used author keywords despite its crucial significance on Millennial accountants, as evidenced by several researchers (Zainuddin et al., 2021; Kurfiss, 1988; Larsson, 2017; Bradford, 1987; Haller et al., 2007). Although it is less common, it emphasizes the significance of developing critical thinking skills among accountants in fast-changing digital environments. Other keywords like *soft skills* highlight the broader aspects of the profession beyond technical competencies often associated with the accountant. Pattern clusters of four clusters allow researchers to uncover similar broad subjects and trends by utilizing keywords inside the same cluster. For example, *artificial intelligence*, *Blockchain*, and *Big data* fall under Cluster 1, highlighting their close thematic association despite not becoming the first top ten. The *COVID-19* pandemic and digital transformation fall under Cluster 2.

Table 1: Author's keywords

Top ten authors' keywords	Occurrence	Cluster
1. Higher education	57	6
2. Accounting education	35	1
3. Artificial intelligence	23	1
4. Accountability	20	3
5. Gender	19	3
6. COVID-19	18	2
7. Digital transformation	16	2
8. Accounting profession	15	6
9. Blockchain	13	1
Big data	13	1
10. Soft skills	12	6
Critical thinking	12	5

Source: Developed by authors.

Figure 1: Author's keywords Network Visualization



Source: Developed by authors.

Frequently Cited Articles: This section discusses *RQ2* on the most cited articles, as shown in Table 2, by setting the minimum citations in VOSviewer software at 50. Out of the total 456 articles, only 23 meet the thresholds. This means only articles with 50 or more citations are examined, and articles that do not meet the minimum set are excluded. This threshold focuses on the most well-cited from a total of 456 articles. The top ten articles most cited, with 489 citations among the researchers, is "Achieving the United Nations Sustainable Development Goals: An Enabling Role for Accounting Research" by Bebbington (2018). This is followed closely by Dwivedi (2023), with 482 citations on research about ChatGPT, perspectives on opportunities, challenges, and implications of generative conversational AI for research.

Other than the two highly cited articles, only a few directly align with digital and critical thinking skills among Millennial accountants regarding accounting practice and professional dynamics. For example, "The Role of Internet-related Technologies in Shaping the Work of Accountants" by Moll (2019) and "An Exploration of the professional habitus in the Big 4 accounting firms" by Spence (2014). The remaining articles focused on a wide range of broader societal issues, for example, globalization ("Globalization, accounting and developing countries"), diagonal accountability ("Critical dialogical accountability"), gender ("Accounting as gendering and gendered") and education-related topics ("E-learning success determinants", "Graduate employability and competence development in higher education" and "Forces for change in higher education").

Table 2: Top 10 Cited Articles

No.	Articles	Total citations
1.	Achieving the United Nations Sustainable Development Goals: An enabling role for accounting research, <i>Bebbington (2018)</i>	489
2.	Opinion Paper: "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy, <i>Dwivedi (2023)</i>	482
3.	E-learning success determinants: Brazilian empirical study, <i>Cidral (2018)</i>	361
4.	The role of Internet-related technologies in shaping the work of accountants: New directions for Accounting Research, <i>Moll (2019)</i>	203
5.	Globalisation, accounting and developing countries, <i>Hopper (2017)</i>	166
6.	Critical dialogical accountability: From accounting-based accountability to accountability-based accounting, <i>Dillard (2019)</i>	160
7.	An exploration of the professional habitus in the Big 4 accounting firms, <i>Spence (2014)</i>	124
8.	Accounting as gendering and gendered: A review of 25 years of critical accounting research on gender, <i>Haynes (2017)</i>	111
9.	Graduate employability and competence development in higher education - A systematic literature review using PRISMA, <i>Abelha (2020)</i>	101
10.	Forces for change in higher education and implications for the accounting academy, <i>Pincus (2017)</i>	100

Source: Developed by authors.

High-Impact Authors with the Highest Cumulative Citation: Table 3 lists the top ten high-impact authors with the highest cumulative citation counts on digital and critical thinking skills in the Millennial accountant profession. All the authors have at least two documents and two citations. From the list, Ogan Yigitbasioglu from Australia is a high-impact author with 220 citations. This shows that the author's work on Millennial accountants has been cited extensively and consistently. This was followed by Chris Carter from the United Kingdom, who had 139 citations. The remaining authors have citations below 70, with Elizabeth Gammie, Mahmudul Md. Alam, Frank Mueller, Maria José Angélico Gonçalves, Gregory D. Saxton, Clay Spinuzzi, Dorothea Bowyer, and Denise Jackson with citations of 67, 54, 52, 51, 47, 46, 38 and 37, respectively. Among all the author's geographic backgrounds, the United Kingdom and Australia are the most contributing country for high-impact authors. Others are from Malaysia, Portugal, Canada, and the United States. The findings of this section are to address RQ3.

Table 3: Top 10 High-Impact Authors

No.	Authors	Total citation	Country
1.	Yigitbasioglu, Ogan	220	Australia
2.	Carter, Chris	139	United Kingdom
3.	Gammie, Elizabeth	67	United Kingdom
4.	Alam, Md. Mahmudul	54	Malaysia
5.	Mueller, Frank	52	United Kingdom
6.	Gonçalves, Maria José Angélico	51	Portugal
7.	Saxton, Gregory D.	47	Canada
8.	Spinuzzi, Clay	46	United States
9.	Bowyer, Dorothea	38	Australia
10.	Jackson, Denise	37	Australia

Source: Developed by author

Highest Publication Journal: Table 4 presents the top ten journals with the highest publication rates, which answers RQ4. However, it is interesting to note that there are differences between the number of articles

produced in each journal and the number of citations by other researchers. Hence, researchers need to consider both quantity and quality when choosing the journal and assessing the impact of scholarly publication. From the table, it is clearly at the forefront is *Sustainability (Switzerland)*, with 50 published articles and 726 citations, indicating a strong presence and significant influence in the field. Following closely is the *Accounting, Auditing and Accountability Journal*, which has 13 articles but a remarkable 758 citations, showcasing its high impact despite fewer publications. Similarly, *Critical Perspectives on Accounting* stands out with eight articles and 487 citations, highlighting its significance in driving critical discourse in accounting. While some journals like *Sustainability (Switzerland)* and *BMC Medical Education* have many articles published, their citation counts are relatively lower, indicating a lesser impact per article. Conversely, journals like *Accounting, Auditing and Accountability Journal* and *Human Relations* have fewer articles but significantly higher citation counts, suggesting a more focused and impactful contribution to the literature.

Table 4: Top 10 Highest Publication Journals

No.	Journals	No. of articles	No. of citations
1.	Sustainability (Switzerland)	50	726
2.	Accounting, Auditing, and Accountability Journal	13	758
3.	Accounting Education	12	167
4.	Critical Perspectives on Accounting	8	487
5.	International Journal of Management Education	7	21
6.	Education Sciences	6	29
7.	Meditari Accountancy Research	6	54
8.	Administrative Sciences	6	12
9.	BMC Medical Education	6	83
10.	Human relations	6	176

Source: Developed by authors

In a nutshell, the above findings address the RQ1, RQ2, RQ3 and RQ4. For RQ1 about the author keywords, *higher education* is the most frequently used by researchers. This is expected because *higher education* prepares the next generation of accountants, and employers want graduates with technical, communication, critical thinking, problem-solving, ethical and professional problem-solving, teamwork, information management, and lifelong learning skills (Ngoo et al., 2015). Hence, educators nowadays should transition from conventional teaching methods to innovative approaches. *Critical thinking* is a keyword that authors use less. However, it is interesting to note that *critical thinking skills* are highly valued by employers today. This is supported by research on case studies in Malaysia, focusing on companies recognized as the Best Employer and Most Attractive Graduate Employers to Work in the past few years (Ahmad et al., 2022). A similar pattern is expected with RQ2 when the article on sustainability was frequently cited instead of the article about the role of internet-related technologies in shaping the work of accountants. COVID-19 has strengthened digital technologies when the population worldwide is forced to stay home with strong internet access, digital tools, and digital abilities (Zainuddin et al., 2021; International Telecommunication Union Academy, 2020).

Thus, critical thinking and digital skills are in demand by current employers in Malaysia. Other researchers should start more research on critical thinking and digital skills to ensure our future graduates meet the Future Fit Accountant that has the right mix of skills among the younger Millennial generation (Ahmad et al., 2022). As for RQ3 and RQ4, the high-impact author and journal publication can be used as a source of reference for future research and inspire subsequent studies and development in the accounting profession field. The high-impact author (RQ3) might introduce novel ideas, theories, methodologies or discoveries that might fundamentally change the way future researchers address specific research in the accounting profession and align with future employer and accounting professional bodies such as The Association of Chartered Certified Accountants (ACCA), Chartered Institute of Management Accountant (CIMA), and others. Meanwhile, a high publication journal rate (RQ4) provides researchers with valuable information about where to target their submissions, increased exposure to other scholars, potential collaborators, and emerging research areas, fostering intellectual exchange and allowing researchers to stay informed about the evolving landscape of

academic publishing. Exploiting these benefits will divert the researcher's research to what the industry and accounting professional bodies require from future accountants (Committee to Strengthen the Accountancy Profession (CSAP), 2014). The researchers' insights will serve as input for legislators to enhance our existing education system, particularly in the field of accounting.

5. Conclusion and Recommendations

This study seeks to conduct a bibliometric analysis of the existing articles on digital and critical thinking skills in the accounting profession of Millennials. It aims to explore emerging research trends, determine potential future paths, and conduct a broad review of the research conducted in these areas. There are four research questions: What are the main themes or topics represented by the authors' keywords in the literature (RQ1)? Which articles are most frequently cited in the literature (RQ2)? Which authors have the highest impact with cumulative citation counts (RQ3)? and which journals have the highest publication rates on digital and critical thinking skills for millennial accountants (RQ4). The finding provides concrete evidence that higher education remains the frequent author keyword, followed by accounting education in the past ten years in academic literature instead of critical thinking skills that potential employers require in the field of accountancy. Nevertheless, digital technology, which is part of digital skills, has started to become the center of research areas by most academic researchers. The top ten articles do not directly align with Millennial accountant's digital and critical thinking skills. Unsurprisingly, the author's keywords related to critical thinking skills did not rank among the top ten. However, future research must prioritize these areas of study, as they are highly sought after by potential employers (Ahmad et al., 2022; Zainuddin et al., 2023).

Researchers must ensure that what they are researching aligns with the current demands of the industry, just like high-impact authors and journal publications. Finally, the findings will provide interdisciplinary approaches incorporating technology-enhanced learning methods, case studies, and real-world simulations to develop holistic skill sets among aspiring accountants. Investments in professional development programs, continuous training initiatives, and technology-enabled learning platforms can bridge gaps in critical thinking abilities while leveraging Millennial accountants' digital competencies. Integrating digital and critical thinking skills into accounting curricula and professional certification programs is essential for preparing future generations of accountants (Van Den Heuvel et al., 2021; Committee to Strengthen the Accountancy Profession (CSAP, 2014) as formal education programs and professional certifications play a crucial role in fostering critical thinking abilities and practical frameworks for problem-solving in accounting contexts. Furthermore, it is crucial for accountants in the 21st century to have the necessary skills, such as digital proficiency and critical thinking, to effectively analyze financial data, make informed business decisions, and utilize various analytical methods. These skills are highly sought after by employers in today's work environment.

Limitations: Several limitations of the study have been identified. Firstly, the study relies on bibliometric analysis with data from the Scopus database, which means that other articles about millennial accountants from different sources, such as the Web of Science (WoS), are not being considered. Second, the study focuses on descriptive analysis, emphasizing authors' keywords, frequently cited articles, and high-impact authors and journals with high publication rates. No further analysis is conducted to examine the relationship between the research questions. Thirdly, certain elements are not being embedded in addressing the research question. For instance, only total citations are analyzed without considering the *h*-index in assessing the high-impact authors in millennial accountants. Some authors have high citation counts but a low *h*-index, which suggests that they have a few highly cited papers that contribute significantly to their total citation count. This means their impact is concentrated in a few influential works rather than spread across a larger body of literature. The finding might be different if *h*-index is included in the analysis.

Direction for Future Research: The study identifies several research opportunities to improve the field. To align with the current demands of the industry, it first suggests prioritizing study areas that are in high demand by potential employers. While digital and critical thinking skills are not among the top keywords, understanding employer preferences can guide future research directions. Additionally, the study proposes exploring other databases like Web of Science (WoS) for bibliometric analysis, expanding the scope beyond the Scopus database. Furthermore, there's potential for investigating the relationship between research questions to gain insights into trends and interactions between variables beyond descriptive analysis. Finally, including

the h-index in the analysis alongside total citations is recommended to assess the impact of authors' work more comprehensively, ensuring a broader understanding of their contributions to the literature on millennial accountants. These research opportunities highlight the importance of aligning research priorities with industry demands, exploring diverse data sources, delving deeper into relationships between variables, and adopting comprehensive metrics for assessing scholarly impact. Addressing these areas can enhance the depth and relevance of research on millennial accountants and contribute to addressing emerging challenges and opportunities in the profession.

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