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Integrating Information Technology into Accounting Curriculum: A 43-Year Review

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Abstract

Purpose - This study provides an analysis view of prior studies on the integration of ICT into accounting curriculum.

Methodology - The method of document analysis is used to collect the data published from 1981 to 2023 in the fields of social science, specifically focused on the study of information technology and accounting curriculum.

Scope of the study - This study revolves around the analysis of the past trends of publication years, the most influential countries, the most research-active institutions and the most highly cited articles in research studies exploring the integration of ICT into accounting curriculum.

Findings -From 1981 to 2023, there has been a noticeable and significant increase in research focusing on integrating ICT into the accounting curriculum. This trend reflects the growing recognition of the pivotal role that technology plays in modern accounting education and practice.

Practical Implications - The increasing research on integrating ICT into the accounting curriculum underscores the critical need for accounting programs to adopt advanced technologies, enhancing students' technical skills, job readiness, and alignment with industry standards, thereby maintaining educational institutions' relevance and competitive edge.

Originality/ Value - This study lies in its comprehensive analysis of how technological advancements have been progressively adopted in accounting education. It uniquely documents the evolution of educational practices in response to ICT, providing a historical

perspective that underscores the growing importance of digital competencies for accounting professionals. It also offers valuable insights for educators, policymakers, and researchers, guiding future curriculum development to ensure accounting education remains relevant and prepares students for modern workforce demands.

Keywords: ICT, information technology, accounting curriculum, accounting education.

1. Introduction

Today, rapid technological advancements in various sectors, particularly in information technology, are reshaping traditional workplace practices, including those within the accounting profession. Factors such as increased access to data analytics, economic globalization, and the emergence of the fourth industrial revolution (IR4.0) are compelling companies, particularly those in the accounting field, to reconsider and innovate their task structures by integrating technology (Tan & Fawzi, 2017). The emergence of more advancements of Information and Communication Technology (ICT) such as big data, cloud computing, block chain, the Internet of Things (IoT) and artificial intelligence (AI), university students must undertake a journey of technology transformation, optimizing the utilization of digital resources within interactive settings, and proactively acquiring skills for the future (Moll & Yigitbasioglu, 2019).

Educational institutions play a vital role in this endeavor by crafting and implementing demand-driven development programs, fostering professional skills and competencies among accounting graduates. The ongoing progress of digitization and automation is driving significant advancements across all aspects of accounting tasks, prompting to more basic issues arose questioning about the continued relevance of traditional technical accounting skills. The 2024 Wolters Kluwer Accounting Industry Report reveals that over 50% of accounting firms are planning to expand their use of artificial intelligence tools to stay abreast of industry changes and technological advancements. This prompts the question: Is there still a need for accountants in today's world? And will technology soon replace accountants altogether? (Goel, 2020; Ghani & Muhammad, 2019). Richard Anning (2020), the head of the IT Faculty at the Institute of Chartered Accountants in England and Wales, has raised concerns about the potential decline in the employment of accountants due to the increasing integration of technology into accounting tasks. Competitive pressures within the accounting field have underscored the importance of accounting graduates possessing technology skills (Osmani, Hindi & Weerakkody, 2020). Does this suggest that the accounting profession is becoming less reliable in the foreseeable future? Merely possessing theoretical knowledge of technology is insufficient for accounting graduates to excel in their careers. They must also gain practical experience in utilizing technology to its fullest extent, ensuring their relevance in a competitive market and securing long-term employment prospects.

In Malaysia, the ongoing debate surrounding the adequacy of employability skills among accounting graduates has persisted since 2014 (MIA, 2014; Muda, Hassan & Samad, 2009). A strong academic background alone is no longer deemed sufficient to ensure employability, as modern employers increasingly seek accounting graduates with exceptional technology competencies, particularly due to the globalization of many companies (Kavanagh & Drennan, 2008). According to the 'Hala Tuju 2' report from the Ministry of Higher Education (MOHE), students have shown promising performance in practical training, but their proficiency in utilizing technology and communication tools receives lower ratings (see *Table 1*). Additionally, findings from the 'Hala Tuju 3' report by the MOHE further support this observation, indicating a lack of proficiency among accounting graduates in utilizing technology, which is typically only acquired once they enter the workforce. A survey that has

been conducted by the MIA in between July and September 2017, involving over 1,052 respondents from the four sectors of its membership was aimed to gather feedback on their adoption of technology. The survey revealed that over 50% of the barriers to technology adoption were attributed to a lack of understanding of the benefits of adopting technologies, a shortage of talent to effectively utilize technology, and high business costs (see *Figure 1*). To ensure that accounting graduates meet the quality standards outlined by the MOHE and professional bodies, it is imperative to revamp accounting programs to align with current and future market demands. A recent report by the Malaysian Institute of Accountants (MIA) in 2021 suggests integrating Information Technology (IT) as a core component of accounting curriculum to address these challenges.

Table 1. Students' Personal Values and Skills

Students' Personal Values and Skills	**Average**
Self-discipline	4.63
Able to follow instructions	4.59
Able to work in a team	4.56
Showing interest in a given task	4.30
Capable and efficient in managing work	4.23
Desire to learn and think	4.15
Having analytical and critical thinking skills in accounting knowledge	4.12
Stress management skills	3.69
Technology skills	3.69
Communication skills	3.69

(Source: The Reassessment Report on Accounting Programme at Public Universities of Malaysia 2013 ('Laporan Hala Tuju 2') (MOHE, 2015)

The industries have presented their needs for accounting graduates who are capable in technology knowledge and skills. Therefore, this research was conducted to examine the extent to which academic scholars play their role in conducting studies on the need for elements of ICT knowledge and skills to be integrated into the accounting curriculum. As a result of the growing abundance of software programs, interdisciplinary approaches, and the ability to handle vast datasets, bibliometric analysis has seen significant growth in recent

years (Donthu et al., 2021). This analytical tool aids researchers in pinpointing trends across diverse studies, particularly concerning journal performance. Hence, this study conducts a bibliometric review on the integration of ICT into accounting curriculum, encompassing the following research questions: (1) What is the past trends of publication years in research studies exploring the integration of ICT into accounting curriculum? (2) Which are the most influential countries in research studies exploring the integration of ICT into accounting curriculum? (3) Which are the most research-active institutions in research studies exploring the integration of ICT into accounting curriculum? and (4) Which are the most highly cited articles in research studies exploring the integration of ICT into accounting curriculum?

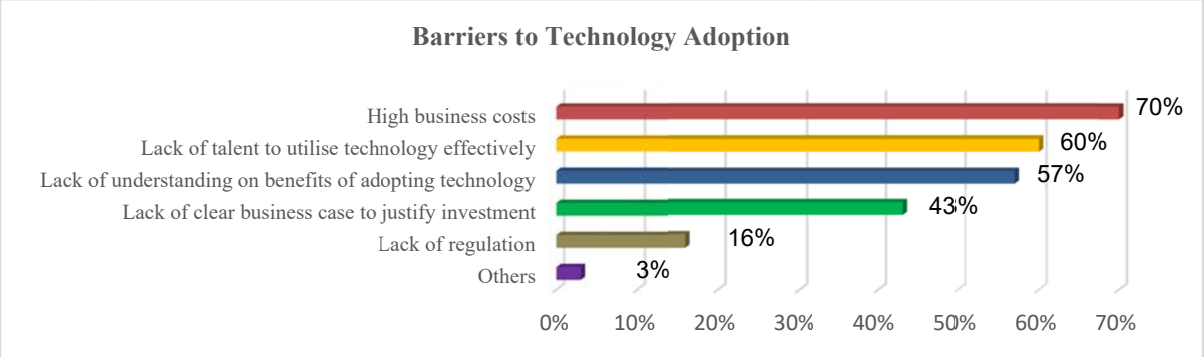

Figure 1. Barriers of Technology Adoption in Malaysian Industries

(Source: MIA Digital Technology Blueprint 2018)

2. Methods

This research utilized bibliometric analysis alongside quantitative and statistical methods to examine the distribution patterns of research articles within specific topics and timeframes (Noor et al., 2023; Rodzi et al., 2023; Noor, 2022; Martí-Parreño et al., 2016). A quantitative research approach, employing bibliometric methods, was employed to evaluate research documents pertaining to the integration of ICT into accounting curriculum within the Scopus scientific database. Search strings comprising "information technology" and "accounting curriculum" were utilized to retrieve relevant documents in any language, spanning publication years from 1981 to 2023. The earliest paper found in the Scopus database was from 1981. A total of 904 research papers containing the search strings were returned from the search query. The search was confined to the business, management, and accounting subject areas, reflecting the increasing interest in this field, with 181 research papers analyzed.

The documents were examined using the "Analyse search result" feature in Scopus. The results were then exported to a Microsoft 365 Excel file to calculate the frequencies and percentages of the published materials. Subsequently, the data was analyzed utilizing ten bibliometric indicators (Rodzi et al., 2023). These indicators were employed to identify trends in research concerning the integration of ICT into accounting curriculum, focusing on the following aspects: (i) the past trends of publication years; (ii) the most influential countries; (iii) the most research-active institutions; and (iv) the most highly cited articles. It

should be noted that all results presented here are derived from documents sourced from conference proceedings, book chapters, and journals included in the Scopus database.

3. Results and Discussion

Analysis of Major Contributors to Research on the Integration of ICT into the Accounting Curriculum

3.1 The Past Trends in Publication Years of Research

This part of the study emphasizes the outcomes related to the past trends in publication years of research regarding the integration of ICT into accounting curriculum from 1981 to 2023. Within this section, the results pertaining to the collective past trends in publication years are outlined in *Table 2*, while the trends of the years showed in *Figure 2*. The data in *Table 2* shows that the total of publications is 181. Based on the bar graph in *Figure 2*, it shows that the trends in publications regarding the integration of ICT into the accounting curriculum demonstrate several key phases over the years. Initial research activity was sporadic during the early years between 1980 and 1990, with only single publications in 1981, 1986, and 1989, and no publications in several years (1982-1985, 1987-1988, 1990). This period reflects the early stages of exploring ICT in accounting education, where interest and resources were likely limited. Starting from 1991, there was a gradual increase in publications, with 2 publications in 1991 and 1992, followed by a notable peak of 4 publications in 1993. Subsequent years showed fluctuating yet consistent output, with 3 publications in 1994, 2 in 1995, 3 in 1996, and 1 publication per year from 1997 to 2001. This period marks growing recognition of the importance of integrating ICT into the accounting curriculum, likely driven by advancements in technology and initial academic curiosity.

Table 2. The Past Trends in Publication Years of Research on the Integration of ICT into the Accounting Curriculum from 1981 to 2023

Years of Publication	Number of Publications	Total Publications
2023	23	23
2022	13	13
2021	18	18
2020	10	10
2019	11	11
2018, 2014, 2010, 1996, 1994	3	15
2017, 2015	9	18
2016, 2009, 2004, 2003	5	20
2013	12	12
2012	7	7
2011, 1993	4	8
2008, 2006, 2005, 1995, 1992, 1991,	2	12
2002	6	6
2001, 2000, 1999, 1998, 1997, 1989, 1986, 1981	1	8
2007, 1990, 1988, 1987, 1985, 1984, 1983, 1982	0	0
	Total publications	**181**

A significant surge began in 2002 with 6 publications, followed by 5 each in 2003 and 2004, indicating an increased focus on this area of research. This trend continued with periodic dips but generally higher activity: 2 publications in 2005 and 2006, 5 in 2009, 3 in 2010, 4 in 2011, and reaching 7 in 2012. This phase corresponds with the widespread adoption of ICT tools and the realization of their potential to enhance accounting education. From 2013 onwards, there is a clear and sustained growth in publications. A notable peak of 12 publications occurred in 2013, followed by fluctuations yet generally high numbers: 9 in 2015 and 2017, 11 in 2019, 10 in 2020, and substantial increases in 2021 with 18 publications, 2022 with 13, and 2023 with 23 publications. This period highlights the maturity of ICT integration in the accounting curriculum, driven by technological advancements, institutional support, and a robust body of research highlighting its benefits.

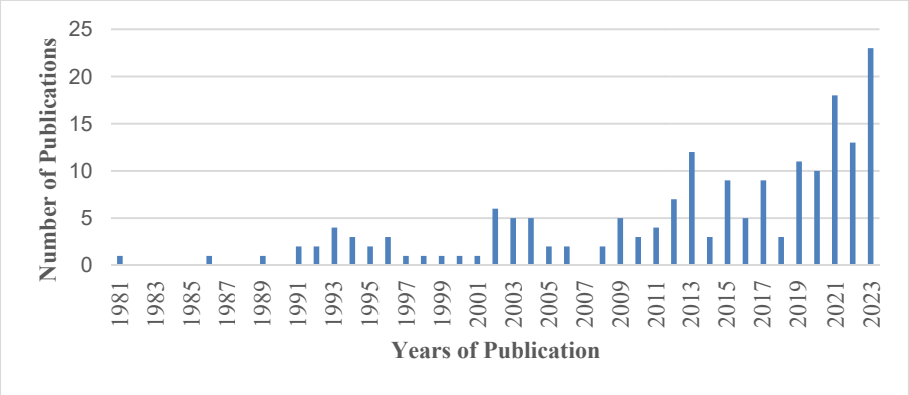

Figure 2. The Past Trends in Publication Years of Research on the Integration of ICT into the Accounting Curriculum from 1981 to 2023

3.2 The Most Influential Countries in Research Study

This study applied the bibliometric method by Rodzi et al. (2023), utilizing the top 10 contributors for each variable used in their bibliometric analysis. *Table 3* summarizes the top 10 most influential countries that contribute to research study publications on the integration of ICT into accounting curriculum. The United States led with 63 publications which is significantly in publications. This dominance is due to several factors, including the country's substantial investment in educational technology, a large number of research institutions, and a strong emphasis on innovative teaching methods. The United Kingdom is the second most influential country in this field. This can be attributed to its strong educational system, emphasis on research excellence, and commitment to integrating technology into education. The UK's academic environment encourages collaboration and innovation, which supports extensive research outputs. Australia's notable contribution as the third topmost influential country is due to its proactive approach in adopting educational technologies and promoting research in this area. Australian universities and research institutions often engage in international collaborations, enhancing their research capabilities and output.

Table 3. The Most Influential Countries in Research Study

Countries	Number of Publications
United States	63
United Kingdom	13
Australia	12
Indonesia	10
Canada	8
South Africa	7
Jordan	6
Iraq	5
China	4
Egypt	4

Indonesia is the leading ASEAN country in this field, reflecting its growing focus on modernizing education through ICT. Government initiatives, increased funding for education, and a push to align with global educational standards have driven this trend. The fifth top highest is Canada with 8 publications, followed by South African, Jordan and Iraq with 7, 6 and 5 publications, respectively. Meanwhile, China and Egypt have 4 publications in this research area. These contributions highlight their commitment to educational innovation and the adoption of technology to enhance accounting education.

3.3 The Most Research-Active Institutions in Research Study

Table 4 shows the top 10 most research-active institutions from all over the word that contributed to the highest number of publications on the integration of ICT into accounting curriculum research area. Out of the 187 documents, leading the list is Southeast Missouri State University (United States) with 6 publications. The high publication count reflects a strong emphasis on educational technology and accounting education research. Monash University follows closely with 4 publications, highlighting its robust research environment in Australia fostering innovation in accounting education. Meanwhile, University Utara Malaysia, The University of Rhode Island, San Jose State University, University of South Australia, Al-Balqa Applied University, Bina Nusantara University, Al Ain University, and Bucharest University of Economic Studies each contribute 3 publications, demonstrating a widespread global interest in leveraging ICT to enhance accounting education. This distribution underscores a universal recognition of ICT's transformative potential in modernizing accounting pedagogy, catering to diverse educational needs worldwide.

Table 4. The Most Research-Active Institutions in Research Study

Institutions	Number of Publications
Southeast Missouri State University	6
Monash University	4
University Utara Malaysia	3
The University of Rhode Island	3
San Jose State University	3
University of South Australia	3
Al-Balqa Applied University	3
Bina Nusantara University	3
Al Ain University	3
Bucharest University of Economic Studies	3

3.4 The Most Highly Cited Articles in Research Study

Table 5. The Most Highly Cited Articles in Research Study

Journals	Number of Publications
Accounting Education	13
Journal of Emerging Technologies in Accounting	11
Journal of Accounting Education	7
Journal of the International Academy for Case Studies	6
Issues in Accounting Education	5
Advances in Accounting Education Teaching and Curriculum Innovations	3
Eastern European Journal of Enterprise Technologies	3
Academy of Strategic Management	2
Accounting Organizations and Society	2
Cogent Business and Management	2

Table 5 presents the top 10 most highly cited article in research studies on the integration of ICT into the accounting curriculum, categorized by journal. The data highlights the leading journals in this research area. Accounting Education journal is the top journal with 13 publications, emphasizing its significant contribution and influence in the field. The Journal of Emerging Technologies in Accounting follows closely with 11 publications, indicating its strong focus on the intersection of technology and accounting education. The third highest is the Journal of Accounting Education with 5 publications, showing a substantial engagement in this research area. The Journal of the International Academy for Case Studies, meanwhile, contributes with 6 publications, reflecting its role in case-based accounting education research. Journal of Issues in Accounting Education has 5 publications, further demonstrating the interest of journal in innovative educational practices in accounting. Both Advances in Accounting Education Teaching and Curriculum Innovations and the Eastern European Journal of Enterprise Technologies have 3 publications each, indicating a moderate involvement in the ICT integration discourse. The Academy of Strategic Management, Accounting, Organizations and Society, and Cogent Business and Management each have 2 publications, showing a smaller but still contribution to the field.

4. Conclusion

The objectives of this study are to identify research trends on the integration of ICT into the accounting curriculum, specifically identifying: (i) the past trends of publication years; (ii) the most influential countries; (iii) the most research-active institutions; and (iv) the most highly cited articles using the bibliometric technique. The findings of this study provide new insights into the ICT integration in the accounting curriculum. Results for the first objective showed that, from 1981 to 2023, there has been a significant increase in research focused on the integration of ICT into the accounting curriculum. This trend is driven by rapid technological advancements and the growing demand for accountants skilled in today's

modern digital tools. Globally, studies highlight that ICT integration enhances the learning experiences (Maiti & Priyaadharshini, 2024; Lee, 2023; Ukpe, 2023; Smeda, Dakich & Sharda, 2014; Ghavifekr et al., 2012), improves data management skills (Lee, 2023; Smeda et al., 2014), and aligns accounting education with industry standards (Al Ghatrifi, Al Amairi, & Thottoli, 2023; Osmani et al., 2020). For instance, a report by the International Federation of Accountants (IFAC) in 2024 underscores the essential role of ICT skills in enabling accountants to meet the evolving needs of the global market. In Malaysia, the Ministry of Higher Education has actively promoted ICT adoption in higher education, recognizing its importance in preparing graduates for the digital economy. A study by the MIA (2021) found that incorporating ICT in the curriculum significantly improved students' analytical and problem-solving skills, making them more competitive in the job market. Therefore, the consistent research growth in this area reflects the crucial role of ICT in transforming accounting education to meet both global and local demands.

Meanwhile, results for the second objective showed that the United States has been at the forefront of research on integrating ICT into the accounting curriculum, setting a benchmark for other countries. Globally, the positive outcomes of these studies have influenced educational reforms in various regions. The American Accounting and the American Institute of Certified Public Accountants, both key bodies acknowledged the importance of technology and shaped the future of accounting higher education (Association of Chartered Certified Accountants, 2021; Soroosh & Krahel, 2018). In line with the ASEAN Federation of Accountants (AFA), specific technologies such as data visualization, integrated audit modules and cloud infrastructure have been emphasized in order to cater the needs for transforming and reshaping the policies and processes of the accounting profession (AFA, 2023). In ASEAN countries, there is a growing emphasis on incorporating ICT into accounting education, driven by the need to keep pace with technological advancements and global industry standards (AFA, 2023). Malaysia, in particular, has shown strong commitment to this effort. The Malaysian Ministry of Higher Education and the MIA have both advocated for and implemented policies promoting ICT integration. These initiatives aim to equip graduates with the necessary skills to thrive in a digital economy, demonstrating Malaysia's dedication to aligning its accounting education with international best practices. This collective push from the U.S., ASEAN countries, and Malaysia underscores the global recognition of ICT's vital role in modernizing accounting curriculum and preparing future accountants for the challenges of a technology-driven world.

Southeast Missouri State University has been a leading institution in researching the integration of ICT into the accounting curriculum. Their studies reveal that incorporating technologies such as data analytics software and cloud-based accounting systems significantly enhances students' technical skills and readiness for the modern workplace (Geerts et al., 2013; Eom et al., 2012; Varnon & Stacy, 2010; Marshall & Varnon, 2009; Beard, Schwieger, & Surendran, 2007; Henry & Varnon, 2007). Monash University has also played a pivotal role in this field, focusing on how ICT can improve accounting education through innovative teaching methods and practical applications of technology. Their research underscores the importance of ICT in fostering a deeper understanding of complex

accounting concepts and preparing students for a technology-driven industry (Birt et al., 2018; Beaman & Ricardson, 2007; Mathews, 2004; Lange, 2003). This research commitment to integrating ICT is echoed in Malaysia, particularly at Universiti Utara Malaysia (UUM) (Ku Bahador & Haider, 2020; Hassan, Ali & Hsbollah, 2019; Harun Rasit, Rosli, & Ibrahim, 2012; Ismail, Abdullah, & Kamardin, 1999). UUM has actively pursued ICT integration in its accounting programs, supported by initiatives from the Malaysian Ministry of Higher Education and the MIA. These efforts aim to produce graduates who are well-versed in digital tools and can meet the evolving demands of the accounting profession.

Results for the fourth objective showed that the *Accounting Education* is a prominent publication that has significantly contributed to the research on integrating ICT into the accounting curriculum Kelly, Hall, & Connolly, 2023; Cohen & Karatzimas, 2022; Yoon, 2021; Kotb, Abdel-Kader, Allam, Halabi, & Franklin, 2019; Wulandari & Ali, 2019; Ramachandran & Ragland, 2016; Spraakman, O'Grady, Askarany, & Akroyd, 2015; Mcvay, Murphy & Wook, 2008; Marriott*, Marriott & Selwyn, 2004; Mathews, 2004; Chang & Hwang, 2003; Lange, Suwardy, & Mavondo, 2003; Meer & Adams, 1996). Known for its high citation rates, the journal has published numerous influential articles that explore the pedagogical advancements and technological innovations in accounting education. This journal has been instrumental in highlighting the benefits of ICT integration, such as improved data management skills, enhanced analytical capabilities, and better alignment with industry standards. These previous studies offer evidence-based recommendations and best practices for educators, demonstrating the journal's commitment to advancing accounting education through technology. Additionally, the journal's involvement in this research area underscores the global academic community's recognition of the essential role that ICT plays in preparing accounting students for the modern, technology-driven business environment. The insights from these publications have influenced educational policies and practices worldwide, including in regions such as ASEAN and Malaysia, where universities are actively integrating ICT into their accounting curricula to meet the demands of a digital economy.

The study on the integration of ICT into the accounting curriculum provides valuable insights by analyzing research trends over time. By utilizing bibliometric techniques, this study sheds light on the global academic community's efforts to modernize accounting curricula, ensuring students are well-equipped for the demands of the digital age. The comprehensive analysis provided by this bibliometric study supports educational policymakers, institutions, and researchers in making informed decisions to further enhance the integration of ICT in accounting education. This study, however, exclusively focused on the Scopus database as the primary source of documents. It did not encompass all available sources, even though Scopus is one of the most comprehensive databases indexing scholarly works (Noor, Noor & Wan Ya, 2023; Rodzi et al., 2023; Noor, 2022). Focusing on the integration of ICT into the accounting curriculum in ASEAN countries is essential due to the unique technological, educational, and economic contexts within the region, which require tailored strategies to address specific local needs and to enhance regional competitiveness in the digital economy. Future studies should incorporate additional databases such as Web of Science, Google Scholar, and

Dimensions, and explore a wider range of topics to yield more comprehensive and valuable results (Noor, Noor & Wan Ya, 2023; Rodzi et al., 2023; Noor, 2022).

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