

Guest editorial: Accounting in transition: influence of technology, sustainability and diversity

Introduction

The impact of new technologies, escalating environmental issues, increasing tension between the values of economic equality and diversity and accounting's ability to adapt to these rapid paces of change and uncertainties are the major challenges facing the accounting profession. These challenges also raise a host of secondary issues that accountants will need to address in the foreseeable future. As accounting scholars, we believe there is a crucial need for up-to-date studies addressing the influence and impact of technology, sustainability and diversity on accounting and accounting practices, which remained under-explored in accounting research. Evidence from the manuscripts contributing to this special issue of the *Pacific Accounting Review* shows that the accounting community, that is, businesses, academic institutions and practitioners, was mainly unprepared to deal with rapidly emerging changes, whereas some approached it in reactive or adaptive ways. As highlighted by Guthrie and Parker (2016), accountants could successfully respond to such challenges only if they move beyond their traditional capabilities and embrace aspects of value creation and global sustainability.

To generate discussion on emerging issues, we organised the 18th Auckland Regional Accounting (ARA) Conference [1] on 9 December 2020 with the conference theme "Technology, Sustainability and Diversity: Transforming Accounting". The conference saw a line-up of experts which among others included The Honourable James Shaw, Minister of Climate Change in New Zealand, who promoted the incorporating of climate change information as a part of the New Zealand financial reporting framework; and Distinguished Professor Paul Spoonley who shared his knowledge, experiences and thoughts on diversity and ethnicity. The contributions in this special issue are primarily from the manuscripts presented at the conference.

This special issue offers new ideas and themes of current importance that permeate into the accounting academic and practitioner discourse. The nine contributions to this special issue cover a wide range of topics, research contexts, organisational perspectives and theoretical and practical insights. They provide reflections on the influence of technology, sustainability and diversity on the transformation of accounting and offer lessons and insights for the future of accounting and accounting practices. These contributions are grouped into three categories: technology, sustainability and diversity and then examined based on emerging themes within each category.

Technology and accounting in transition – emerging themes

Six manuscripts in the special issue deal with the influence of technology on accounting and the challenges faced by accounting academics in embracing technology in developing the accounting curriculum and assessment, the impact of new technologies on the required skills and work of accountants.

Embracing technology in the development of accounting curriculum and assessment

Accounting plays a crucial role in the information supply chain, capturing and integrating transactional data and then converting the data into various types of useful information.



The development of information technology (IT) has provided us with data analytics skills and artificial intelligence (AI) techniques such as machine learning and deep learning. Such skills help us to extract insights from the data better. Wang (2022) provides insights about this concern by sharing his experiences of executing a data analytics programme at DePaul University in the USA. Some of the major challenges faced by the author in the development and revision of emerging technology-related courses include the rapidly changing nature of the course, lack of readily applicable materials and limited technology resources, time consumed and the lack of support and recognition for the efforts of the teaching staff. The students' inability to identify, analyse and interpret the data and provide actionable recommendations were also cited as major issues. The author recommends collaboration between accounting programmes and the business profession to bring new practices to classrooms and contributes new thoughts to the profession.

The power of technology has also transformed the assessments in accounting education. Digitization has brought about the transition from traditional to online accounting education, and COVID-19 has accelerated this trend (Reyneke *et al.*, 2021). The drastic pivot to online learning because of the pandemic forced universities to replace traditional face-to-face assessments with online assessments (White, 2021). Ali *et al.* (2022) shared their lived experiences in transforming established assessment practices in accounting courses to align with online teaching and learning. They expected online assessments may replace traditional face-to-face assessments in accounting and if done properly, could drive significant improvements in student learning and outcomes. They urged institutions to invest in and provide appropriate technology and staff training and ensure well-designed, authentic and fair online assessments. Also, they suggest academic integrity could be upheld by integrating e-proctoring systems in robust online assessments practices. They suggest that future studies examine and compare the issues and challenges of online assessment of other global universities and learn from their experience in overcoming the challenges. In addition, other research opportunities could be to carry out interviews with academic staff and students to get a better understanding of the concerns and opportunities of online assessment so that ongoing improvements can be made.

Impact of technology on the required skills of tomorrow's accountants

The adoption and use of new technology such as intelligent automation, big data, blockchain and cloud-based software have brought about significant changes to the accounting profession (Qasim and Kharbat, 2020). There is now an increasing focus on how accountants acquire, analyse and interpret data to inform organisational decision-making (Moll and Yigitbasioglu, 2019). Technological advances have, thus, led to changing skills requirements of accountants. Jackson *et al.* (2022) aim to find out how and why technology is impacting the skills requirements of early career accountants (ECAs) and the preparedness of ECAs for future technological work. They adopted a multi-stakeholder, mixed method approach to survey and interviewed ECAs and managers/recruiters from different industry sectors and organisation type in Australia. Their findings show that both ECAs and managers believe new technology is influencing skills required in accounting. They highlighted the need for greater dialogue, benchmarking and performance evaluation in technology-related skills among ECAs and their managers, to better prepare the ECAs for new technology. To gain deeper insight into the impact of technology on the skills required of tomorrow's accountants, they suggest that further research could be carried out to examine how perspectives vary with respect to an individual's own developmental journey and career trajectory, which can enhance our understanding of how new graduates and ECAs could prepare for the fast-evolving digital environment. Another research avenue,

they propose, is to find out the accounting educators' perspective towards changing skill requirements, because universities play an important role as educators and trainers for ECAs.

Effect of technology on the nature of work of accountants

Digital transformation at the workplace is changing the work of financial auditors as observed by [Liew et al. \(2022\)](#) in their exploratory study on the implementation of data analytics in the Big-Four accounting firms. The authors find a climate of positive attitude towards new technology and accompanying actions in the Big-Four firms and that financial auditors are providing deep business insights through data visualisation. However, they also comment that the full potential of data analytics could only be achieved through a transformation process within accounting firms and through improvement in quality of IT systems in their client companies. They suggest that to implement "smart audit systems", it is crucial for the accounting firms to appoint transformation managers, recruit technology-savvy graduates and provide extensive data analytics training to their employees. Consistent with [Wang \(2022\)](#) and [Jackson et al. \(2022\)](#), the authors emphasise the importance for accounting graduates to possess the aptitude to become "citizen data scientists".

Transitioning from the former system of bookkeeping and reporting to the use of accounting software for recording and reporting accounting information has spurred a trend in the use of AI. AI can enhance accounting functions to move beyond financial reporting and compliance to detecting misstatements and irregularities using algorithms, data structures and code languages ([Ding et al., 2020](#)). Motivated by the need to understand the transformative change in accounting with the emergence of AI, [Kommunuri \(2022\)](#) reflected on the core role that AI-based technology plays and its usefulness in accounting. Meanwhile, the development of accounting software has contributed to a more efficient and effective working environment ([Abdinnour-Helm et al., 2005](#)). Using the end-user computing satisfaction model developed by [Doll and Torkzadeh \(1988\)](#), [Wells et al. \(2022\)](#) surveyed 122 users of cloud-based small business accounting software, that is, Xero, and found that users' satisfaction and perceived effectiveness are more strongly influenced by content and accuracy than factors such as format, ease of use and timeliness. This study provides knowledge to small and medium businesses in their software selection decisions. It also serves as a platform for academic researchers to extend the research to other cloud-based accounting software application and provide functionality suggestions to software developers for future software development.

The manuscripts on the technological influences on accounting suggest that digital transformation has radically changed the nature of accounting practices and for accountants to be ready to leverage the potential of digital tools, they need to focus on developing their core competencies through lifelong education and skill development training. Future research could explore the required skills and preparedness of accountants for different types of new technology and across the diverse areas of accounting practice. Researchers could also investigate the digital disruption in various lines of accounting service, to provide a holistic understanding about the challenges and issues accountants face at work. Furthermore, apart from focusing on the large accounting firms, the views of accountants in medium and smaller auditing firm could be examined to evaluate the impact of industry-wide changes. In addition, future research could explore the hiring process for accountants, the evolving recruiting situation concerning accounting and business technology and the ways in which accounting professional bodies and tertiary education providers are responding to it.

Sustainability and accounting in transition – emerging themes

Accountants' traditional stewardship responsibilities of providing sound financial management and reporting of a company's assets have evolved amidst the growing global awareness of social and environmental issues. Humanity's complicated relationships with nature have resulted in serious sustainability issues such as food and water crises, climate change and global warming. Other critical risks such as political and social instability, governance failure and health-care crises also have a profound impact on the sustainability and business resilience of a company. Consequently, companies need to consider the impacts of their economic decisions on the natural environment and on the social conditions in which people live and work. Researchers such as [Thomasson *et al.* \(2020\)](#) have emphasised the importance of accounting in managing "wicked problems" in sustainability such as climate change. Thus, accountants play an increasingly crucial role in helping companies to develop more sustainable business practices to address these uncertainties and challenges ([IFAC, 2015](#)). However, to do so, the accountants would require having a greater awareness of how they can make a difference, as well as developing the professional skills and competences to support their company to be more sustainable.

This section on the influence of sustainability on accounting in transition comprises of two contributions, with the former relating to the issues of integrating sustainability education in the accounting curriculum and the latter focusing on the impact of ownership structure and corporate governance on energy intensity.

Issues of embedding sustainability education in the accounting curriculum

While [Thomas \(2004, p. 33\)](#) comments that accounting graduates need to develop "literacy" in sustainability, [Kagawa \(2007\)](#) suggests that it is necessary for education providers to provide students with quality and specialised sustainability-related programmes. [Sharma and Steward's \(2022\)](#) study focuses on the effective learning strategy on sustainability education. Specifically, they examine the embedding of sustainability courses in the accounting curriculum of Delta Business School in New Zealand, with semi-structured interviews conducted to gather information from the course controllers and students. They find that while some courses are strongly embedded with sustainability in their curriculum, other courses are weak in sustainability and mainly focus on the technical aspect of accounting. Furthermore, most of the strongly sustainability embedded courses are elective courses, whereas the compulsory courses with weak sustainability content only provided the students with limited and repetitive knowledge on sustainability. The authors suggest that commitment from top management such as the dean of the school and accounting heads of department is crucial for effective embedding of sustainability in accounting courses. They also recommend that the business schools promote sustainability accounting education through the offer of sustainability accounting as a minor alongside accounting subjects.

Currently, only a small number of manuscripts directly address the deep challenges that sustainability education poses in the classroom ([Gray, 2013, p. 309](#)). Future research could explore how global universities and higher education institutions embed sustainability education into their curriculum. In transforming accounting education along a sustainability trajectory, there is also a need for research that explore and provide evidence for reforms required at various levels in the education system ([Dyball and Thomson, 2013](#)). In addition, with mandatory climate disclosure taking effect globally, requiring the largest companies to disclose climate-related financial information (such as in the UK) ([Farrar, 2022](#)), future research could examine how educators could make sustainability accounting "real" in the accounting classroom, that is, how to convert accounting numbers to evaluate and disclose

sustainability performance and how to teach sustainability accounting in a way that encourages critical thinking and reflection skills. As emphasised by [Alawattage et al. \(2021, p. 230\)](#), accounting students need to be given “[. . .] the opportunities of “accounting” for the problems that global citizens of the contemporary world face [. . .].”

Impact of corporate governance on energy efficiency

Climate change has caused widespread disruption in nature and has affected the lives of billions of people around the world. Mass mortalities in trees and corals are caused by heatwaves, floods and droughts and the avalanche effects are becoming harder to manage. These extreme weather patterns have exposed millions of populations to critical shortage of food and clean water. Worse still, people and ecosystems that are least able to cope are the ones being hardest hit ([IPCC, 2022](#)).

As the world battles climate change, energy efficiency has become a critical issue and is highly prioritised in the sustainable energy hierarchy ([International Energy Agency, 2019](#)). A company’s energy consumption relies on its investments in energy-saving projects ([Song and Oh, 2015](#)) and its innovativeness in finding solutions to energy challenges ([Costa-Campi et al., 2015](#)). Past studies in corporate governance show that agency conflicts can affect both a firm’s investments and its level of innovation ([Hoskisson et al., 2002](#)). [Hickman et al. \(2022\)](#) examine how agency conflicts arising from pyramidal ownership structures impact the energy intensity of group-affiliated Indian firms. The authors hypothesize that the group-affiliated Indian firms face governance challenges such as profit tunnelling, resulting in poorer monitoring, higher costs of capital and, consequently, under-investment in energy efficient projects. They expect this under-investment to be most prominent among group-affiliated firms in which the controlling promoter has a low ownership stake. Their findings supported their prediction that firm ownership structure and associated governance challenges have significant impact on corporate energy intensity. This study is timely particularly because India is the world’s third leading source of carbon emissions ([Fleming, 2019](#)) and energy efficiency is one of the keys in addressing climate change ([International Energy Agency, 2019](#)). It also raises awareness among activists and motivates regulators to consider agency problems among group affiliated firms in emerging markets.

Going forward, are accountants poised and have the competency to address these sustainability challenges and make a difference? Future studies could examine stakeholder engagement in sustainability accounting and reporting, such as how internal and external stakeholders could affect the implementation of the companies’ sustainable development agenda. Another avenue for future research would be to investigate how companies are adopting and integrating the Sustainable Development Goals (SDGs) into their policies and decision-making processes and how the companies’ accounting systems are identifying, integrating and reporting on the SDGs, targets and indicators ([Kaur and Lodhia, 2019](#)). In the corporate governance domain, research could be extended to examine the impact of specific corporate governance characteristics and mechanisms on the sustainability policies of companies, in both emerging and developed markets. Future research could also investigate the relationship between ownership structure and energy efficiency across different geographic locations ([Hickman et al., 2022](#)).

Diversity and accounting in transition – emerging themes

The global call for diversity has changed the image of accounting profession, which was described, traditionally, as a closed profession exclusive to a privilege group ([Botes, 2018](#)). With support from accounting firms, professional bodies and educators, the accounting profession has increasingly embraced accountants from diverse background. Universities

have also encouraged and promoted diversity in accounting education. However, the COVID-19 pandemic has deepened the existing systemic inequalities, not only at the global and geographical levels but also has exposed the socio-economic inequalities within the society and the inequalities among individual based on factors such as education and ethnicity (Blundell *et al.*, 2020). This section on the influence of diversity on accounting in transition is concerning the Pasifika under-representation in accounting.

Impact of ethnicity on accounting education

Pasifika is one of the fastest growing ethnic groups in New Zealand (Tertiary Education Commission, 2021). Pasifika students are classified as priority learners because of their relatively low educational success rates compared to other ethnic groups (Turner *et al.*, 2015). Drawing on Bourdieu's (1977) theory of practice with a focus on the notion of symbolic violence, Fukofuka and Ali (2022) evaluate the challenges faced by Pasifika students in the learning of accounting. The authors expressed their concerns on how the accelerated utilisation of online learning in accounting education because of the pandemic could further impede Pasifika students from completing an accounting qualification, thus perpetuating Pasifika under-representation in accounting. This study highlights the potential of online learning as an additional impediment for Pasifika students in accounting education and show there is an urgent need to formulate suitable teaching practice strategy to better support Pasifika students in online learning. Apart from the Pasifika students, evidence suggests that other students from disadvantaged communities also suffered greatly with much greater dropout and failure rates compared to other ethnic groups, when universities pivoted towards online learning (Ako Aotearoa, 2020). Future research could conduct survey, interviews and focus group meetings with students, accounting educators and support staff to examine how Pasifika and Maori students, as well as students from other ethnic minority groups could be better supported in online learning of accounting.

Diversity has been commonly defined based on demographic factors such as gender, race and ethnicity, tenure, education, marital status and religion with 89% of research focused on these surface level or observable diversities (Jackson *et al.*, 2003). These surface traits are relatively easier to collect and use in research and also had been regarded as proxies for other underlying "hidden" traits (Ahmed and Bukth, 2019). Other non-demographic diversity such as sexual orientation is less observable (Jonsen *et al.*, 2011) and thus potentially more challenging in terms of data collection, resulting in lesser research in this area. Researchers in accounting and accountability could take up the challenge of exploring corporate disclosure of these non-demographic diversity practice. Apart from the conventional corporate reports, other channels of corporate media such as corporate social responsibility/diversity webpages on company websites and the companies' various social media platforms could be more extensively examined in longitudinal studies to provide an in-depth understanding of workplace diversity disclosure practices. Apart from using thematic content analysis to find out common themes of workplace diversity disclosure, it would be interesting to use alternative methods that could examine the quality of disclosure. Quantitative content analysis could also be carried out to investigate the statistical significance of the influence corporate leadership and allies towards the workplace diversity disclosure practice of the companies. In addition, future research could be carried out to address inequalities exposed (because of various types of diversity) in the wake of COVID-19 such as issues relating to gendered divisions of labour, gender stereotypes and roles and other systemic inequalities (Fisher and Ryan, 2021). In sum, accounting and accountants play a crucial role in identifying, understanding, measuring, reporting and repairing these inequalities so as to produce a more equitable future for all of us (Andrew *et al.*, 2021).

Conclusion

The nine contributions featured in this special issue have provided interesting accounts of the influence of technology, sustainability and diversity towards the transformation of accounting and accounting practices. These manuscripts impart strong messages for the future, on what accounting and accountants could do to accept and adapt to the continuous changes brought about by the technological advancement and social and environmental issues. Specifically, they highlighted the importance of new technologies, contemporary sustainability and diversity contexts in shaping accounting education and the accounting profession. Clearly, there is a need to continue to explore the interplay between these influences and accounting and accounting practices.

This special issue serves as a strong reminder that accounting and accountants can and must embrace technology, sustainability and diversity. Accounting educators and accountants need greater awareness of how they can make a difference, as well as the importance of developing professional skills and competences to support organisations that are increasingly becoming technologically driven, sustainable and equitable.

Serving as guest editors for the special issue has been a challenging but rewarding experience. We appreciate and are impressed with the strong sense of commitment of the accounting community in addressing these impending issues. There is still abundance of future avenues for research. We hope this special issue will promote new ideas of importance for accounting academic and practitioner discourse that will eventually influence change in how accounting is practised and taught.

Sabrina Chong, Asheq Rahman and Anil K. Narayan

Accounting Department, Auckland University of Technology, Auckland, New Zealand

Note

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