

Accounting Curriculum in the Digital Era: Suggestions for Preparing Botswana's Tertiary Accounting Graduates

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Abstract

Some educational institutions' might not have developed curricula that are in line with digital technology for future accounting professionals (Islam, 2017). It is imperative that tertiary institutions in Botswana should prudently consider developing or incorporating new learning outcomes and competencies in accounting curricula against digital technological changes when preparing accounting graduates for the industry. Secondary and desktop research was engaged through intensive reports from large global and regional Professional Accounting Organisations (PAOs) such as ACCA, CIMA, BICA, SAICA, AAT and ICAEW which consulted with their various international stakeholders and the industry towards future accountants' skills and competencies. These are mostly government-sponsored professional qualifications in Botswana except for ICAEW and SAICA which will balance as additional international and regional PAOs. More research was also sought from journals, publications, discussion and opinion papers as well as newspapers in order to collate the digital and technological competencies that are suggested. This paper therefore seeks to alert the Botswana educational curriculum developers to consider and incorporate new technologies that will prepare Botswana for dynamic, world-class and competitive accounting graduates in tertiary institutions towards the changing accounting profession. The findings showed that the accounting profession's digital skills gap can be closed by incorporating cloud computing, big data, eXtensible Business Reporting (XBRL), artificial intelligence, machine learning and similar in Botswana accounting graduates' curriculum.

Keywords: Accounting, change, curriculum, digital, education, graduate, technology, PAOs, profession

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1. Background

1.1. Reasons for changes in the accounting profession

The accounting profession is fast changing and so should the educational curriculum, towards technologically competitive graduates. The main catalyst is the digital era which led to globalization, increasing reporting requirements and the subsequent emergence of new regulations. The evolution of the accounting profession goes as far back as the scribes in ancient Mesopotamia and bookkeepers in the Roman Empire (Pacioli, 1924). For today's accounting education curriculum, new accounting standards are being developed and technological innovations are evolving even though most accounting fundamentals have not changed (Smith, 2018). In as much as these essential accounting basics have remained the same, technological changes have greatly influenced how they are now executed in the business environment and so should the delivery methods, learning outcomes and assessments in educational curriculum. Islam (2017) and O'Connell et al (2015) agreed that significant changes will be experienced in the accounting profession and that educational institutions across the globe should respond accordingly. However, not everyone looked at the impact of these changes with a positive hindsight on the accounting education curriculum. Some scholars like Luis Arquero Montaño et al (2010) felt that the impact of these changes will be draining on accounting learners. There is therefore need to replace outdated content with new up-to-date learning resources so that students are not overwhelmed by continuing to learn obsolete material while trying to catch up with new technology as well.

It is with this background that this paper seeks to look ahead and suggest caveats and provisions for accounting learners' curriculum development in line with changes in the digital era. Key to the suggestions to be made are to proactively alert educational institutions on the expected changes in accounting curriculum which will help learners to be more relevant, knowledgeable and effective in harnessing digital technology in their future accounting profession. In its Vision 2036, Botswana wishes to equip its students with relevant global competencies in education that are outcome-based through an educational curriculum that is aligned to technology (Vision 2036 Presidential Task Team (Botswana), 2016).

1.2. Effects of an outdated Accounting curriculum

Effects of an outdated accounting curriculum are dreadful. Dellaportas (2019) and Nelson (1995) warned of the following effects of outdated traditional conventions in accounting curricula and pedagogical techniques:

- They lead to ill-prepared graduates for a dynamic profession

- Graduates with limited global exposure will be produced
- Tertiary educational institutions will conceive graduates that are not employer-ready
- The curriculum framework will have a pedagogy that simply encourages memorization at the expense of outcome-based students who can relate concepts to various circumstances
- There will be lack of strategic direction in the workplace
- Limited exposure to technology will be experienced
- There will be goal or content-based education instead of active and independent students in the learning process
- Increases in graduates, who cannot communicate, verify or apply financial information because of rote-learning.

As the accounting profession is going through transformation, Botswana's industry will need well-equipped accounting graduates to fill the future vacancies where the accountant's role will be more techno-centred. These new advancements in technology will need to be incorporated in educational curricula especially at tertiary level.

2. Research Method

In response to the new competencies required for accounting graduates, the author's study employed desktop research by reviewing selected relevant research documents from six regional and global Professional Accounting Organisations (PAOs); ACCA (Association of Chartered Certified Accountants), CIMA (Chartered Institute of Management Accountants)/CGMA (Chartered Global Management Accountants), AAT (Association of Accounting Technicians), SAICA (South African Institute of Chartered Accountants), BICA (Botswana Institute of Chartered Accountants) and ICAEW (Institute of Chartered Accountants in England and Wales). Website articles, journals, some discussion and opinion papers, online sources, academic literature and newspaper articles among other critical accounting documentation were reviewed. Also reviewed were literatures from published and unpublished journal articles. Literature used was covering from year 2015 onwards so as to capture most recent technological updates. Since the accounting bodies have written a lot of articles on the profession's changes, selected search phrases were employed towards specific digital accounting competencies that were incorporated in the different syllabi of these renowned accounting bodies. Therefore, articles with abstracts, titles, keywords and headings from various accounting, finance and management journals were reviewed. Mostly, the search phrases included, 'future accountant', 'digital technology in accounting', 'future skills/competences in accounting', 'accounting curriculum and digital technology', 'changes in accounting profession', 'XBRL', 'artificial intelligence', 'cloud computing', as well as the digital competencies and each of the accounting bodies specified above. Articles were read to determine their relevancy to the study. 42 articles were reviewed which included local newspaper articles relevant to the scope of the topic as well as published articles by the PAOs. From the selected articles, random selection was done on the pool of articles found in order to avoid bias. Each PAO's curriculum plus one article was conveniently selected so as to adequately address the issue at hand. For the main competencies and outcomes to be incorporated in curriculum, author employed a tabular approach which also showed additional competencies that may be considered in addition to the ones suggested and discussed in this study.

3. Literature Review

3.1. Introduction

Birt (2018) discussed some essential ICT skills necessary for accountants in the digital era and these will be discussed in this article as important updates in accounting curricula in Botswana as they have also been recently incorporated into the accounting syllabi of the various PAOs. These include big data; block chain technology, cloud computing, eXtensible business reporting language (XBRL), artificial intelligence and machine learning. In an outcome-based curriculum as in Botswana, these components are important for curriculum developers to incorporate not just as contemporary, emerging issues or electives; but as part of the core content of curriculum. On digital technology's implications for teaching, Islam (2017) and Birt (2018), agreed with ACCA (2016)'s report on Drivers of change and future skills, which revealed how knowledge of digital technologies is one very important competency area that professional accountants have a major skills gap to fill. Professional accountants will need to develop themselves in these skills in order to allow them to have more inclusive corporate reporting where a balance is struck between both the numbers and also the narratives behind the computed financials. Each of these technologies will be discussed in detail below and possibly how they relate to tertiary accounting education curricula.

3.2. Big data

Big Data will be widely used in managerial accounting towards budgeting and control while in financial accounting or reporting, big data will help to enhance quality, relevance, transparency for users' decision making as well as the formation and review of accounting standards (Warren, Moffitt, and Byrnes, 2015). This will

therefore help accounting graduates to enter into the business world and analyse large data sets using technology in order to show patterns, financial trends, and forecasts. This was echoed by Galetto (2018) when considering how current emergence of algorithmic data analytics will assist in examining big data by interrogating large quantities of data facing current businesses to produce patterns, financial correlations, and trends for more robust business reporting. Indeed, Botswana's population, economical information and infrastructure are growing such that big data management is inevitable (Akinola et al, 2017; Agarwal, 2018; and Bolt and Hillbom, 2018). Islam (2017) suggested that tertiary institutions should consider investing in their current staff members through training or possibly recruiting new experts in order to coordinate and lecture in new accounting units which are affected by big data technology. Current curriculum development and review in Botswana needs to take such changes into cognizance.

3.3. Block chain technology and Crypto currency

CGMA (2019) attested how the Big Four Accounting firms are all excited about the potential that block chain technology is likely to bring in the business environment's transactions. Botswana has not been left out in crypto currency and blockchain technology. The Big four and other accounting firms in Botswana are among the interested parties in blockchain technology and hence will prefer accounting graduates with an appreciation of block chain technology. Dogo et al (2019) mentioned Botswana among some of the developing countries that already have blockchain start-ups in Africa who have been sensitized on crypto currency and block chain technology. Graduates with such unique contemporary knowledge are likely to be more employable and add value to firms than their peers.

While skeptics are there in crypto currency technology, Pinielo (2017) elaborated on bitcoin digital payment system's gaining of traction in Botswana with how some businesses including a clinic in Gaborone, are accepting bitcoin. He also mentioned how proponents of Bitcoin in Botswana are expecting blockchain technology to become more and more acceptable in the country and the region. Curricula in educational institutions must therefore expose graduates to discussions relating to fundamentals of blockchain technology and their impact on accounting systems in accordance with the levels on Bloom's Taxonomy (Wilson, 2019). Important Accounting components such as auditing, financial reporting and financial management will be significantly affected by blockchain technology or distributed ledger technology, as it is also widely known (ACCA, 2016; Smith, 2019). However, the regulatory framework of this new or disruptive technology is still debatable and under construction (Riseley, 2016).

3.4. Cloud computing

Another essential curriculum outcome for tomorrow's accounting graduate is cloud computing (Du and Cong, 2010; ACCA, 2016; CGMA, 2019). To prepare accounting graduates for digital technology, Pan and Seow (2016) argued that accounting educators should review current curricula against clearly lacking information systems' emerging concepts such as cloud computing. This was ratified by Coyne, Coyne, and Walker (2017) who encouraged accountants to use in-house cloud computing rather than to outsource it since it has become a major role in accounting areas like auditing. Alam (2018) expressed how Malaysian accounting firms have resorted to cloud computing in order to save costs in providing their services. It is most likely that local firms will look for professionals and accounting graduates with an appreciation of cloud computing in order to save operational costs. Khanda and Doss (2018) stated that cloud computing has taken root in Botswana, with several big companies adopting it including the renowned Poso cloud by Botswana Post, IT-IQ, and Dimension Data, to name just a few. However, they enumerated the challenges faced by companies in adopting cloud computing such as cyber-attacks, power dependence, data migration and others, but still agreed that its benefits and regional adoption outweigh these challenges. There is therefore an inescapable need for accounting curriculum to prepare graduates with cloud computing adeptness, challenges, and interactions with other technologies such as big data (Mosco, 2015).

3.5. Artificial intelligence (AI)

In the accounting world today, the use of artificial intelligence is no longer an option to be outsourced or considered under service or support centres for the accountant, but rather a core requirement in the profession such as in auditing (Giles, 2019). Artificial Intelligence or machine learning as it is sometimes called is now everywhere (Mohri et al, 2018). For example, machines and computers are learning to read, analyses trends, interpret certain patterns of data and avail a set of options; just the same as a human being would do. Closing the skills gap in accounting now increasingly requires prospective accounting professionals to obtain new skills-sets including the subject of artificial intelligence (Thomson, 2017). Accounting graduates in Botswana who will demonstrate understanding of artificial intelligence are therefore likely to be better preferred by employers in the near future. Examples of machine learning were demonstrated in China towards bankruptcy prediction on which traditional statistical models and got low prediction accuracy while AI proved otherwise (Li and Wang, 2018).

This exacerbates the likely use of machine learning in accounting risk assessment by auditors and other accountants over the manual ratios computations.

3.6. *eXtensible business reporting language (XBRL)*

Pinsker and Li (2008) studied the early adopters of the XBRL's benefits and costs. Their findings pointed to much more advantages to their respondents such as an ability to report financial information from diverse formats and jurisdictions, improved accessibility, interoperability, time and cost savings from reuse of data, decreased data redundancies, increased corporate accountability and transparency in financial reporting especially in the wake of corporate scandals like Enron, and hence a better competitive advantage form increased investor confidence and compliance with domestic legislation. There was a satisfying dispel of the common notion that new technology adoption is risky and costly. More than a decade on, these same findings are still being confirmed by recent writers like (Klimczak, 2019; Abdolmohammadi et al, 2018 and Zhang et al, 2019). From their verified empirical scientific research, they have even enhanced the early adopters of the standard's benefits to include improved flow of financial information, increased quality and quantity of data available to recipients, increased comparability of financial statements, increased ability of users to process and analyze data, reduced information asymmetry between market participants and thereby reducing costs of equity and increasing market liquidity. In fact, Zhang et al (2019) ousted the purported expectations of future crash risk of the XBRL standard after the U.S. Securities and Exchange Commission (SEC) mandated the adoption of eXtensible Business Reporting Language (XBRL) in 2009.

In China, (Wen, 2019) proved how XBRL has been extensively incorporated in several curriculum for accounting undergraduate students of financial management such as corporate management and credit rating, auditing, securities markets, taxation, and financial administration. However, they warned of how education and training of XBRL can lag behind due to ignorance. In United States, United Kingdom, and other jurisdictions, XBRL is being widely incorporated or considered to be incorporated in accounting curriculum (Lee et al, 2018; Kotb et al, 2019; and Sir, 2018). Global accounting bodies such as SAICA, ACCA, ICAEW, CGMA and AAT have also encouraged their members and sensitized their students about digital technologies that accountants now need to prepare to change towards.

4. Analysis and research findings

Digital technological skills for future Accountants have continued to be addressed by most regional and global PAOs as shown in Table 1 below. Articles stated were collated and analysed below, showing how digital technology is being constantly sensitized to students, members, examiners, tutors and other stakeholders of the PAOs in preparation of the changing profession and curriculum of the accountants. Curricula of these PAOs have been updated to accommodate changes in the accounting profession. This is in agreement with Islam (2017)'s suggestions of ensuring that skills gaps are covered up. Similarly, this also avoids the technological lagging of outdated curriculum and obsolete pedagogical technique that were suggested by Dellaportas (2019) such that the accountants that are produced can apply financial information to various situations without rote-learning and are also exposed to current technology. However, these lessons that are to be learnt from these PAOs should be tailor-made to Botswana's industry but towards Botswana's Vision 2036's goal for graduates who are relevant not only in Botswana, but to global educational competencies and well aligned to technology (Vision 2036 Presidential Task Team (Botswana), 2016).

From Table 1 below, various tertiary institutions in Botswana would also find other technologies more preferable for their accountants to be more competent in. Out of the six PAOs that were analysed, the following technologies were cutting across more than four PAOs' curriculum inclusion which may show their generic nature to the various fields of accounting. These are Data analytics, Big Data, Cloud Computing, Smart Software, Blockchain technology, Artificial intelligence, Cyber-security and Internet of Things. Other technologies such as drone technology, social media, video conferencing, crowd funding, digital costing and e-business may however, be preferences in various accounting fields. In the PAOs syllabi, the technologies that were cutting across were similarly visible in various accounting modules from auditing, cost accounting, financial accounting and other fields. Different institutions in Botswana could also be able to do needs analysis and market research against the advantages inherent each of these digital competencies towards more robust curriculum for their graduates. Arguably, the various PAOs do not seem to have explicitly addressed Wen (2017), Islam (2017) and Kotb et al (2019)'s adoption of XBRL in their curricula. It seems this digital competency has a long way to go especially for auditors, financial analysts and accountants, but the technology has not been clearly included yet in their competencies framework yet it has been suggested as one of the most disruptive technologies of our time in the accounting profession. However, Botswana educators and curriculum developers would consider its benefits and inclusion in as much as it benefits the nation's conceived graduates above their peers.

Table 1. Analysis of PAOs' Digital competencies inclusion

PAO	ACCA	AAT	BICA	CIMA	ICAEW	SAICA
Source documents: (article and or syllabi)	Article: Professional accountants – the future: Drivers of change and future skills and Syllabi	Article: The Future Accountant White Paper	Article: BICA Technical bulletin – News from BICA	Article: CGMA Competency Framework and Syllabi	Article: Accounting for the Future and Syllabi	Article: SAICA Current and future relevance of the profession
Year of publication	Article (June 2016) and syllabi (2019)	October 2018	May 2019	2019	Article April 2018 and	November 2018
Digital technologies covered	Drone technology	√				√
	Social media	√		√	√	√
	Mobile Phone Tech	√	√	√	√	
	Data Analytics	√	√		√	√
	Big data	√	√		√	√
	Cloud computing	√	√	√	√	√
	Smart software	√	√	√	√	√
	Video conferencing	√				
	Blockchain (Distributed Ledger tech)	√	√		√	√
	Crowd funding	√				
	Artificial intelligence	√	√		√	√
	Cyber security	√		√	√	√
	Internet of Things	√			√	√
	Digital costing	√			√	
	e-business	√				√

5. Conclusion and recommendations

The above accounting bodies and others have written other articles on digital technology and other relevant skills that the future accountant must have. It is imperative that firms, organisations, educational institutions consider these and incorporate these in their training curriculum. Besides the accounting graduates, different firms in Botswana should look into developing and training their staff towards current digital technologies named above and others. Tertiary educational institutions can set themselves apart competitively by going ahead of other institutions and designing curriculum in line with most recent technologies. Regulatory bodies in Botswana could also look into encouraging accounting curriculum developers to not only rub these on the surface as specialist areas or electives, but go in line with the country's vision and produce Accounting graduates who are not only relevant, but ahead of their time. Conclusively, more research could be done towards these technologies' modular inclusion, and their impact on financial performance of entities that have adopted them.

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