

**STRIVING FOR INNOVATION: A QUADRUPLE HELIX
INTERVENTION FOR ACCOUNTING EDUCATION IN GHANA**

by

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Submitted in accordance with the requirements

for the degree of

DOCTOR OF PHILOSOPHY IN ACCOUNTING SCIENCES

at the

UNIVERSITY OF SOUTH AFRICA

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JUNE 2022

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STRIVING FOR INNOVATION: A QUADRUPLE HELIX INTERVENTION FOR ACCOUNTING EDUCATION IN GHANA

I declare that the above thesis is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.



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ACKNOWLEDGEMENTS

I wish to extend special appreciation to everyone who supported me in various ways to complete the current study successfully, especially:

- God Almighty, my source of life, strength and help for timely completion of this research study
- Dr Annelien van Rooyen, my main supervisor, for accepting me as your PhD student. You motivated and assisted me in various ways throughout this tough but interesting PhD journey. You were patient and provided prompt constructive feedback on the work at all stages. I could not have asked for a better supervisor for this research project.
- Prof. Bienkie Shuttleworth, my co-supervisor, for willingly accepting to assist in this research study despite your workload. Your deep understanding of my topic and your valuable contributions have helped me immeasurably to improve this research project to an acceptable standard. Your continuous push for excellence really inspired me.
- Dr Charmaine Williamson, thank you for your excellent qualitative statistical assistance.
- The Student Funding Directorate of the University of South Africa, your timely bursary support is appreciated.
- Thank you to all participants who provided me with data required to conduct the research. This research project would not have been possible without you.
- My dear mother, Dora Adjo Gidimadjor of blessed memory – when I completed middle school and I was unable to further my education immediately, you said to me, “if God said you would further your education, it would come to pass”. After staying at home for two years, I was able to continue my education and finally complete my thesis. I wish you were alive to share in my celebrations!
- My cherished friends and family who did not only believed in me but also motivated me to accomplish this lifelong dream: my dear wife Bibi, and dear children, Akwafo, Prince, Justina and Tiky, thank you all.

ABSTRACT

There have been reports that most newly qualified accounting graduates in Ghana are struggling to secure sustainable employment, mainly because they do not have information communication and technology (ICT) and higher-order thinking (HOT) skills and practical work experience required by employers in this era of information technology. Against this background, the current study explored the ICT and HOT skills that accounting students in Ghana should possess upon completion of the accounting programme to enhance their employability by applying the quadruple helix (QH) innovation model and the Bloom's revised taxonomy for twenty-first-century learners.

Qualitative data was obtained mainly from document analysis of the accounting curricula of five public universities in Ghana and in-depth interviews with the QH innovation agents comprising government, accounting academics, employers and accounting graduates. Thematic review procedures were followed to analyse the data gathered for the current research.

The findings indicated that there is an increasing demand for accounting graduates to acquire ICT skills and knowledge of software packages, such as Microsoft Excel, Microsoft Word, internet usage, accounting software, cloud computing and data analytics. Accounting graduates are also required to demonstrate HOT skills, such as the ability to analyse and interpret information which is processed for decision-making purposes as well as the ability to think outside the box. In addition to the ICT and HOT skills, entrepreneurial and interpersonal skills also emerged as critical skills that accounting graduates need to adapt swiftly in order to achieve success in the current competitive working environment. This requires effective collaboration among the QH agents described in the current study, particularly in the area of creating the accounting curricula and facilitating the work-readiness of accounting graduates to enhance their employability.

Based on the theoretical lens, a framework that will equip future accounting graduates with such skills to enhance their employment and performance in the workplace was developed. The current study makes a unique contribution to the present scarcity of studies on ICT and HOT skills based on design-based research methodology and

application of QH innovative theory application in accounting education, particularly at tertiary level in Ghana.

Key terms:

Accounting education; design-based research (DBR); employability; fourth industrial revolution (4IR); gradueness, higher-order thinking (HOT); information and communication technology (ICT); innovation; quadruple helix; triple helix

OPSOMMING

Volgens verslae sukkel die meeste pas gekwalifiseerde rekenmeesters in Ghana om 'n geskikte betrekking te vind omrede hulle in die era van inligtingstegnologie nie oor vaardighede in inligting- en kommunikasietegnologie (IKT), hoëordedenke (HOD) en werkservaring beskik nie. In die lig hiervan is in hierdie studie ondersoek ingestel na die IKT- en HOD-vaardighede waarvoor afgestudeerde rekenmeesters moet beskik om in diens geneem te kan word. Die viervoudige heliks (VH) innoveringsmodel en Bloom se hersiene taksonomie vir een-en-twintigste eeuse leerders is hierin aangewend.

Kwalitatiewe data is verkry deur 'n dokumentontleding van die rekeningkunde kurrikulums van vyf openbare universiteite in Ghana te doen en diepte-onderhoude met die VH-innoveringsagente te voer. Laasgenoemde sluit in die regering, rekeningkundige akademië, werkgewers en rekeningkundige gegradueerdes. Tematiese oorsigprosedures is gevolg om die data te ontleed.

Daar is bevind dat toenemend verwag word dat rekeningkundige gegradueerdes toegerus moet wees met IKT-vaardighede en 'n kennis van nie alleen sagtewarepakkette soos Microsoft Excel en Microsoft Word nie, maar ook internetgebruik, rekeningkundige sagteware, wolkrekenaarkunde en dataontleding. Hierbenewens moet rekeningkundige gegradueerdes oor hoërordedenkvaardighede beskik. Hulle moet byvoorbeeld inligting kan ontleed en interpreteer wat met die oog op besluitneming verwerk is, en boonop lateraal kan dink. Afgesien van IKT- en HOD-vaardighede, word entrepreneurs- en interpersoonlike vaardighede ook as onontbeerlik in die mededingende beroepswêreld beskou. Dit vereis dat die VH-agente saamwerk om relevante rekeningkundige kurrikulums saam te stel om rekeningkundige gegradueerdes se indiensneembaarheid te verbeter.

Op grond van die teoretiese lens is 'n raamwerk ontwikkel wat toekomstige rekeningkundige gegradueerdes toerus met vaardighede wat hulle indiensneembaarheid en prestasie in die werkplek sal verbeter. Hierdie studie vul 'n leemte aan in navorsing oor IKT- en HOD-vaardighede wat berus op ontwerp gebaseerde navorsingstegnologie en VH-innoveringsteorie in die opleiding van rekenmeesters in Ghana veral op tersiêre vlak.

Sleutelbegrippe:

Rekeningkundige opleiding; ontwerp gebaseerde navorsing (OBN);
indiensneembaarheid; vierde industriële revolusie (4IR); graadwaardigheid,
hoëordedenke (HOD); inligting- en kommunikasietegnologie (IKT); innovering;
viervoudige heliks; drievoudige heliks

ISIFINQO

Kube nemibiko yokuthi iningi labafundi abasanda kuthola iziqu ze-akhawunthingi eGhana badonsa kanzima ukuze bathole umsebenzi osimeme, ikakhulukazi ngenxa yokuthi abanalo ulwazi lwezobuchwepheshe kwezokuxhumana (UBX) kanye namakhono okucabanga okusezingeni eliphezulu (CZP) kanye nolwazi lomsebenzi oludingwa abaqashi kulesi sikhathi sobuchwepheshe bolwazi. Ngokwalesi sizinda, ucwaningo lwamanje luhlale amakhono e-UBXT kanye ne-CZP lapho abafundi be-akhawunthingi eGhana kumele babe nawo lapho bephothula uhlelo lwe-akhawunthingi ukuze bathuthukise ukuqashwa kwabo ngokusebenzisa imodeli yokuqamba ye-khwadrapheli heliksi (KH) kanye nethakzonomi ebuyekeziwe kaBloom yabafundi beminyaka engamashumi amabili nanye.

Imininingwane eyesimo efanelekile itholwe ikakhulukazi ekuhlaziyweni kwamadokhumenti ekharikhulamu ye-akhawunthingi yamanyuvesi amahlanu omphakathi eGhana kanye nezingxoxo ezijulile nama-KH abenzeli bokusungula izinto ezihlanganisa uhulumeni, izifundiswa ze-akhawunthingi, abaqashi kanye nabathweswe iziqu ze-akhawunthingi. Kulandelwe izinqubo zokubuyekezwa kwendikimba ukuze kuhlaziywe idatha eqoqwe ocwaningweni lwamanje.

Okutholakele kubonise ukuthi siyakhula isidingo sabafundi abaphothule izifundo ze-akhawunthingi ukuze bathole amakhono e-UBX nolwazi lwamaphakheji esofthiwe, afana ne-Microsoft Excel, i-Microsoft Word, ukusetshenziswa kwe-inthanethi, isofthiwe ye-akhawunthingi, i-cloud computing kanye ne izibalo zedatha. Abaphothule izifundo ze-Akhawunthingi nabo kudingeka babonise amakhono ashisayo, njengekhono lokuhlaziya nokuhumusha ulwazi olucutshungulwa ngezinjongo zokwenza izinqumo kanye nekhono lokucabanga usabalilise umqondo. Ngaphezu kwamakhono e-UBX kanye ne-CZP, amakhono ebhizinisi nawokusebenzelana nabantu aphinde avela njengamakhono abalulekile abafundi abaphothule izifundo ze-akhawunthingi okudingeka bazijwayeze ngokushesha ukuze bathole impumelelo esimweni samanje sokuncintisana. Lokhu kudinga ukubambisana okuphumelelayo phakathi kwama-ejenti e-KH achazwe ocwaningweni lwamanje, ikakhulukazi endaweni yokudala ikharikhulamu ye-akhawunthingi kanye nokwenza lula ukulungela umsebenzi

kwabafundi abaphothule izifundo ze-akhawunthingi ukuze bathuthukise ukuqashwa kwabo.

Ngokusekelwe kumalensi ethiyori, kwasungulwa uhlaka oluzohlomisa abaphothule iziqu ze-akhawunthingi esikhathini esizayo ngamakhono anjalo ukuze kuthuthukiswe ukuqashwa kwabo kanye nokusebenza kwabo emsebenzini lwenziwa. Lolu cwaningo lwamanje lunegalelo eliyinqayizivele ekushodelweni kwamanje kwezifundo ze-UBX kanye namakhono e-CZP asekelwe endleleni yocwaningo esekelwe ekwakhiweni nasekusetshenzisweni kwe-KH yamathiyori amasha emfundweni ye-akhawunthingi, ikakhulukazi ezingeni lemfundo ephakeme eGhana.

Amagama abalulekile :

Imfundo ye-akhawunthingi; ucwaningo olusekelwe kumklamo (USK); ukuqashwa; inguquko yesine yezimboni (I4Y); ukuthweswa iziqu, ukucabanga okusezingeni eliphezulu (CZP); ulwazi nobuchwepheshe bezokuxhumana (UBX); ukuqamba okusha; ikhwadrapheli heliksi; iheliksi eyingxantathu

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ABBREVIATIONS AND ACRONYMS

1D1F	One District, One Factory
4IR	Fourth Industrial Revolution
AACSB	Association to Advance Collegiate Schools of Business International
ACCA	Association of Chartered Certified Accountants
AI	artificial intelligence
AICPA	American Institute of Certified Public Accountants
ABWA	Association of Accountancy Bodies in West Africa
CA(G)	Chartered Accountants (Ghana)
CAS	College of Accounting Sciences
CFA	Chartered Financial Analyst
CIMA	Chartered Institute of Management Accountants
CPD	continuous professional development
CSR	corporate social responsibility
DBR	design-based research
GIFMIS	Ghana Integrated Financial Management Information System
GTEC	National Council for Tertiary Education
GYEEDA	Ghana Youth Employment and Entrepreneurial Development Agency
HoD	head of department
HOT	higher-order thinking
IAESB	International Accounting Education Standards Board
ICAEW	Institute of Chartered Accountants England and Wales
ICAG	Institute of Chartered Accountants, Ghana
ICT	information communication technology
IFAC	International Federation of Accountants
IFC	International Finance Corporation

IFRS	International Financial Reporting Standards
IGF	internally generated fund
IMA	Institute of Management Accountants
IoT	Internet of Things
IT	information technology
LAN	local area network
LOT	lower-order thinking
MIA	Malaysian Institute of Accountants
NAB	National Accreditation Board
NCTE	National Council for Tertiary Education
NIST	National Institute of Standards and Technology
NYEP	National Youth Employment Programme
PAFA	Pan African Federation of Accountants
PPP	public–private partnership
QH	quadruple helix
RO	research objectives
RPA	robotic process automation
RQ	research questions
SAIPA	South African Institute of Professional Accountants
TH	triple helix
WAN	wide area network
WEF	World Economic Forum
WWW	world wide web
YEA	Youth Enterprise Agency

CHAPTER 1

GENERAL OVERVIEW AND BACKGROUND TO THE STUDY

1.1 BACKGROUND OF THE STUDY

The employment of accounting graduates has declined globally in recent years because graduates lack the employability skills required for effective performance of their functions at the workplace (Cohn 2020:1; Tysiac 2019:1). Instead, employers are now hiring more non-accounting graduates than accounting graduates, especially those with information communication technology (ICT) skills who can utilise such skills to derive and interpret accounting information accurately (Mooney 2020:1; Tysiac 2019). A report by the Association of International Certified Professional Accountants (AICPA) (2019:7) shows that the proportion of non-accounting graduates employed as a percentage of all new graduates employed increased from 11% to 31% while accounting graduates employed decreased from almost 45 000 in 2014 to 30 093 in 2018, with a 19% drop from 2014 to 2016, and 11% from 2016 to 2018. Clearly, this phenomenon may create concern and uneasiness among many accounting graduates since they may not know which employment opportunities are available for them after successful completion of their qualification.

With the rapid developments in technology and globalisation, many organisations are beginning to integrate advanced technologies, such as data automation, cloud computing, big data and analytics, block chain, cyber security and artificial intelligence (AI) in their operating processes in order to survive during the Fourth Industrial Revolution (4IR) (Cascio & Montealegre 2016:350). The use of these technologies has also affected how accounting is implemented in many of these organisations (Osmani, Hindi, Al-Esmail & Weerakkody 2017:318). Many accounting functions have progressed to ICT level (Birt, Wells, Kavanagh, Robb & Bir 2017:8). Consequently, employers are placing a high premium on accountants who possess the relevant ICT skills (Fernandez & Aman 2018:129; Yoon 2020:19). This means that with the arrival of the 4IR, it will be difficult for any accounting graduate without the relevant knowledge in ICT to find employment (Ghani 2019:24; South African Institute of Professional Accountants [SAIPA] 2019:8).

Accounting education needs to evolve to fulfil business requirements (Ahmed 2019:21; Rainsbury, Hodges, Burchell & Lay 2002:8; Yap, Ryan & Yong 2014:563) and must attract, retain and equip students with the skills required to provide accurate accounting and financial information for decision-making in business (Low, Samkin & Liu 2013:1; Musov 2017:434). Accounting education institutions need to train students in order for them to acquire applicable theoretical and practical knowledge, skills and competencies needed for financial decision-making (Ogundana, Ibadunni & Jinadu 2015:115), because these graduates must be able to make meaningful contributions to the organisations where they are employed and the accounting profession as a whole (Ahmed 2019:21). The importance of quality accounting education for the development of any country, including Ghana, can therefore not be over-emphasised (Ahmed 2019:21; Romanus & Arowoshegbe 2014:129).

In Ghana, accounting students who graduate from universities are struggling to secure employment (Ampadu-Ameyaw, Jumpah, Owusu-Arthur, Boadu & Fatunbi 2020:8; Baah-Boateng 2018:6; IFS 2019:7). This is mainly because they lack the necessary skills and competencies. Consequently, they are considered to be incompetent to perform the tasks at the level required of them in the marketplace (Ayarkwa, Adinyira & Osei-Asibey 2012:235; Bawakyillenuo, Osei-Akoto, Ahiadeke, Aryeetey & Agbe 2013:18; International Finance Corporation [IFC] 2019:44; International Youth Foundation [IYF] 2013:11). The accounting educational system in Ghana has been largely blamed for the employment challenges facing graduates because it failed to equip them with the relevant knowledge and skills demanded by employers (Biney 2015:18; Nibelli 2018:1).

The main entities responsible for training accountants in Ghana are the universities (Onumah 2019:5; Osei 2019:3). Currently, ten main public universities offer accounting education in Ghana. There are also three major independent professional accounting institutions, namely the Institute of Chartered Accountants, Ghana (ICAG), the Association of Chartered Certified Accountants (ACCA) and the Chartered Institute of Management Accountants (CIMA) responsible for training accountants in Ghana (Uche 2007:17). Most of the universities offering accounting education in Ghana focus on the study of financial accounting, public sector accounting, management accounting techniques, management information systems, taxation, audit and investigation procedures as well as general education courses. In the learning process of

accounting, the conventional method of teaching is widely used where the facilitators rely on textbooks and exercises in such books.

Globally, people will expect that the knowledge and skills gained by graduates will enable them to secure employment in organisations or establish and manage their own businesses for personal, societal and national development (König & Ribarić 2019:88). Unfortunately, most newly qualified accounting graduates are facing great challenges and competition in getting employed due to, inter alia, a lack of ICT and higher-order thinking (HOT) skills (Hayes, Freudenberg & Delaney 2018:179; Shamsuddin, Ibrahim & Ghazali 2015:22; Yanto, Fam, Baroroh & Jati 2018:13). Baah-Boateng (2015:5) reports that educated young people in Ghana who graduate with degrees in humanities, accounting and business-related programmes are not finding it easy to find employment after university in comparison to graduates with degrees in computer and science-related programmes. The IFC (2019:43) and Macaulay (2014:9) state that 30% of employers in Ghana report challenges in hiring accounting graduates for technology-enabled roles in various sectors. In addition, a British Council report published in 2016 on higher education and employability in Ghana indicated that graduates' unemployment in Ghana is not caused by unavailability of employment opportunities but by a lack of relevant employability skills of such graduates (Ampadu-Ameyaw, Jumpah, Owusu-Arthur, Boadu & Fatunbi 2020:10; Baah-Boateng 2018:4; McCowan et al. 2016:90). Employers are therefore unable to obtain accounting graduates with the right knowledge, skills and competencies to fill positions (Gondwe & Walenkamp 2011:41; IFC 2019:44). Consequently, employers in Ghana are recruiting accounting graduates internationally due to a demand–supply gap for ICT and HOT skills (IFC 2019:45).

In a highly competitive market, many organisations may not have time to train newly recruited staff, and this, accentuated by the highly saturated graduate labour force, lead them to be very particular in their appointments (Osmani et al. 2017:318). Education must therefore provide graduates with the relevant knowledge and skills to stay employable, especially during the 4IR; otherwise the graduates will suffer and organisations and society will be the ultimate losers (Lauder & Mayhew 2020:8; Tran 2016:59).

The focus of this study is on exploring and understanding in depth the ICT and HOT skills deemed essential by the accounting profession in Ghana to enable public universities to develop a relevant accounting curriculum to enhance the employability of accounting graduates in the country. This study employed design-based research (DBR) methodology (Brown 1992:145; Collins 1990:2) along with a quadruple helix (QH) innovation model (Carayannis & Campbell 2009:206) and Bloom's revised taxonomy for twenty-first-century learners (Anderson, Krathwohl & Bloom 2002:215). The research findings offer the requisite elucidation to universities, employers, policymakers and accounting students in Ghana by providing an in-depth understanding and expansion of knowledge on the critical ICT and HOT skills requirements. These are vital for Ghanaian accounting educators to promote those skills in their curriculum to enhance the employability of accounting graduates.

1.2 PROBLEM STATEMENT AND RESEARCH QUESTIONS

Accounting graduates in Ghana cannot get sustainable employment after successfully completing their qualifications (Ampadu-Ameyaw, Jumpah, Owusu-Arthur, Boadu & Fatunbi 2020:8; Ayarkwa et al. 2012:235; Bawakyillenuo et al. 2013:18). This is mainly because they do not have the relevant ICT and HOT skills (that come with the 4IR) required in the workplace (IFC 2019:44; IYF 2013:11). Baah-Boateng (2015:13) concluded that the inability of most accounting graduates to secure employment is a true reflection of the case of a mismatch of skills between what is offered by the universities and the skills needed by employers. This employment–skills gap keeps widening and will be worse with the development of the 4IR.

To date, however, limited studies have been conducted on the relevant ICT and HOT skills required of accounting graduates by employers in Ghana (Natia & Al-hassan 2015:113; IYF 2013:3). The main question of the current study was: which ICT and HOT skills should accounting students possess upon completion of the accounting programme to enhance their employability? The answers to this question will enable public universities to develop relevant accounting curricula to enhance the employability of accounting graduates in the country. Other research questions (RQs) that were addressed by the current study were:

RQ1: Should public universities in Ghana introduce new ICT and HOT skills in the curriculum of accounting degrees?

RQ2: Which ICT and HOT skills do accounting graduates in Ghana need for their career?

RQ3: Which roles will government, academics, employers and graduates play in the development of ICT and HOT skills of accounting graduates in Ghana?

RQ4: How will government, academics, employers and graduates collaborate to promote the development of ICT and HOT skills of accounting graduates in Ghana?

1.3 RESEARCH OBJECTIVES

Specifically, the study sought to achieve the following research objectives (RO):

RO1: to determine whether public universities in Ghana should introduce new ICT and HOT skills in the curriculum of accounting degrees;

RO2: to determine the ICT and HOT skills accounting graduates in Ghana need for their career;

RO3: to analyse the roles government, academics, employers and graduates play in the development of ICT and HOT skills of accounting graduates in Ghana; and

RO4: to examine how government, academics, employers and graduates could collaborate to promote the development of ICT and HOT skills of accounting graduates in Ghana.

1.4 THESIS STATEMENT

Developing a framework for universities in Ghana for incorporating ICT and HOT skills in the accounting curriculum is a possible solution to the employment challenges accounting graduates experience in Ghana.

1.5 THEORETICAL FRAMEWORK OF THE STUDY

The theoretical framework underpinning this study was based on the QH innovation theoretical model (see Carayannis & Campbell 2009:206) and Bloom's revised taxonomy (of educational objectives) (see Anderson et al. 2002:215).

1.5.1 QH innovation model

The QH innovation theoretical model was developed by Carayannis and Campbell (2009:206) in extension of the triple helix (TH) innovation model (Etzkowitz & Leydesdorff 2000:111), which focuses on the overlapping relationship between the spheres of government–academics–employers in the knowledge society context. In this context, QH means adding to the TH innovation model a fourth helix (Carayannis & Campbell 2009:206). The QH concept can be seen in various academic research reports, albeit with varying emphases (Arnkil, Järvensivu, Koski & Piirainen 2010:15; Carayannis & Campbell 2009:206; Hasche, Höglund & Linton 2020:525; Lindberg, Lindgren & Packendorff 2014:100). Claiming that the TH innovation model is limited in breaking into new grounds for innovation to promote sustainable development in the unfolding twenty-first century, Carayannis and Campbell (2009:206–207) added the “public” as the fourth helix, clearly defined as “media” and “culture-based public” and “civil society”.

Knowledge and innovation politics could be considered as a reflection of the dynamism of media-oriented democracy for strategy development for the purpose of becoming an innovation policy to enhance economic performance (Carayannis & Campbell 2009:218). Moreover, the inclusion of civil society in the model was to fill the gaps between the public and innovation. The QH innovation model of Carayannis and Campbell (2009:206) maintains that, under the TH innovation model, the new technologies fail to meet the needs of society completely, therefore restricting their potential impact. Additionally, including civil society in innovation and production of knowledge may be considered a means of enhancing democracy in the process of innovation as well as improving accessibility to various government and academic recourses for underprivileged groups (Lindberg, Danilda & Torstensson 2012:40).

Cavallini, Soldi, Friedl and Volpe (2016:5) also reported on the QH approach to accelerate the transfer of innovation results to the regional growth of society. The QH innovation model emphasises the societal responsibility of universities, a third mission in addition to the role of the universities of educating and conducting research. Evidently, the public has become more prominent, and Caruso (2018:383) identifies four dimensions related to the voice of society, namely customer expectations, product enhancement, collaborative innovation, and new organisational designs.

Carayannis and Campbell (2010:51) consider the fourth helix the learned society, i.e. knowledgeable consumers actively participating in innovative systems. Some authors (e.g. Arnkil et al. 2010:15; Pascu & Van Lieshout 2009:83; Yawson 2009:3) call the fourth helix “the user” (including consumers, civil society associations, businesses), which presents the user-oriented innovation as a significant successful factor for all private and public sector organisations. With this approach, user groups are provided with the best opportunity to be successful in business innovations (Arnkil et al. 2010:15). Arnkil et al. (2010:17) maintain that the extent of user participation may possibly be described as comprehensive because of the users’ active involvement and participation in the development of their new products and services. In the user-oriented design approach, users may contribute ideas, produce content or develop parts of products. The designer’s role is to be the facilitator (Arnkil et al. 2010:17).

In another study, Betz et al. (2016:588) investigated the fourth helix as “innovation intermediaries” established in the universities to provide assistance to enterprises operating on small and medium scales. The QH innovation model could enhance the development of skills, ideas and creativity and could therefore contribute to the innovation process in the university, government establishments, industry and civil society; hence, the four actors would interact with each other to speed up innovation transfer (Dzisah & Etzkowitz 2008:107; Praswati 2017:702).

Collaboration among government, academics, employers and graduates is necessary in skills development and the achievement of required outcomes of graduate employability (Jackling & De Lange 2009:381; Jackson & Chapman 2012:126). The current study therefore used the QH innovation model (Carayannis & Campbell 2009:206) and termed the fourth helix ‘graduates’, referring to the individuals within society who have completed an accounting major degree at a university and are ready to gain employment and work in an accounting environment. This version of the QH innovation model will explain how government, academics, employers and accounting graduates could work together for the development of industry-relevant education, training programmes and opportunities to enhance employability of accounting graduates in Ghana. Figure 3:3 represents an alternative QH framework adopted to guide this study.

1.5.2 Bloom's taxonomy on thinking and learning

Bloom's taxonomy on thinking and learning – named after Benjamin Bloom – will be used to explain HOT skills because the activities of analysing, evaluating and creating are reflected by the top three levels in Bloom's revised taxonomy reworked by Anderson et al. (2002:215). Bloom's taxonomy has been used in educational settings over the years and serves as guidance to educators when setting learning objectives and assessments for HOT (Bali 2014:50). For example, Zapalska, Nowduri, Imbriale and Wroblewski (2018:7) adopted Bloom's revised taxonomy to propose a strategy for advancing HOT in an undergraduate management major programme at the United States Coast Guard Academy.

Bloom, Engelhart, Furst, Hill and Krathwohl (1956:18) devised this taxonomy to categorise different levels of thinking. The taxonomy is a progressive hierarchy of thinking skills, indicating that the thinking skills of a person progress and develop from a lower level to a higher level (Bloom et al. 1956:18; Reinstein & Lander 2008:82–83). In the original version of the taxonomy, Bloom et al. (1956:18) classified knowledge, comprehension and application as lower-order thinking skills and analyses, syntheses and evaluation as HOT skills. In Bloom's revised taxonomy, Anderson et al. (2002:215) used action words (i.e. verbs) to describe the thinking skills. Bloom's revised taxonomy classifies remembering, understanding and applying as lower-order thinking skills, and analysing, evaluating and creating as HOT skills (Anderson et al. 2002:216). This suggests that students should be able to remember facts and concepts at the most basic level of learning, motivating them to be able eventually to create new work at the highest level. In between those two extreme thinking skills, students should progressively be able to understand, apply, analyse and evaluate information.

1.6 JUSTIFICATION OF THE STUDY

Although there have been several empirical studies aimed at determining the extent of ICT and HOT skills required by accounting graduates, there is still a gap in knowledge in the field of accounting. Many of these studies were conducted in countries other than Ghana, with obvious cultural and business environmental differences as well as contrasting findings. Examples of such studies are those by Tam (2011) in New Zealand, Elsaadani (2015) in Egypt, Cory and Pruske (2012) in the United States,

Tanaka and Sithole (2015a) in Australia, and in Indonesia, Yanto et al. (2018). Limited research has been conducted in Ghana to investigate ICT and HOT skills required by accounting graduates from a holistic and overarching perspective. The study by Awayiga, Onumah and Tsamenyi (2010:151–153) focused on general ICT knowledge and skills in Ghana and failed to provide a comprehensive ICT and HOT skills framework for professional accountants. General ICT knowledge and skills are those that all tertiary education graduates need irrespective of their area of study (Tam 2011:16). Awayiga et al. (2010:156) focused in their case study only on accounting graduates of the University of Ghana, neglecting accounting graduates from other universities in Ghana. Research findings by Awayiga et al. (2010) and the other researchers mentioned in this paragraph can therefore not be generalised to include all accounting graduates in Ghana.

The current study selected accounting graduates from five public universities (refer to section 4.6), which are guided by policies of the Government of Ghana to allow a more representative cross-section of accounting graduate participants in order to avoid bias and to support transfer of findings to other similar situations. Additionally, most of the studies identified from the literature review focused on accounting graduates and employers (Awayiga et al. 2010:146; Gibbs, Steel & Kuiper 2017:371). This study involved accounting academics and government (refer to section 4.6) identified as major stakeholder groups of a university (Chapleo & Simms 2010:14–15). Specifically, government was represented by officials from the National Council for Tertiary Education (NCTE) and the National Accreditation Board (NAB) divisions of the Ministry of Education in Ghana. Refer to sections 4.6 and 4.7 for more detail on how the sample of respondents was selected from the four stakeholder groups and how data were collected.

The four stakeholder groups – government, accounting academics, employers and accounting graduates – provided a comprehensive view on the ICT and HOT skills that accounting graduates need for employment (refer to section 4.5). Although professional bodies are key stakeholders in accounting education (see Bui, Hoang, Phan & Yapa 2017:267), they were not included in this study because the professional bodies in Ghana do not have direct control over the curriculum development of universities. The role of the professional bodies involves the regulation of professional examinations and practice. However, NAB includes members of the professional

bodies in their team when reviewing the curriculum of the universities for accreditation purposes. This enables NAB to draw on the expertise of members of the professional bodies.

1.7 SIGNIFICANCE OF THE STUDY

The current study explored ICT and HOT skills within the context of accounting graduates in Ghana from the perspective of their inability to meet employers' skills requirements. The findings of the current study will assist government, academics, professional accounting bodies and other stakeholders in the accounting sector in formulating policies relating to employability skills of accounting graduates. The study will provide information that will assist stakeholders to collaborate and to pool resources, expertise and capacities for the development of skills and competencies relevant to the workplace, for instance for the 4IR. Based on the findings, the researcher developed a framework that will inform the relevant role players using the QH innovation model in terms of their roles to equip accounting students with relevant ICT and HOT skills to enhance their employment and performance in the workplace. Students will be able to uncover relevant ICT and HOT skills, which they will need to focus on with the objective of enhancing their employability in the world of work. In addition, the research findings will help universities that offer accounting to strategise and attract very resourceful and qualified ICT lecturers to train and prepare accounting students for the technology-based workplace. Furthermore, this study is significant in adding to the discourse on ICT and HOT skills requirements of accounting graduates, and further has ramifications for practice and future research in accounting. With reference to contributions to the QH literature, this study offers an alternative QH framework, which emphasises a very strong focus on the relationships among the major QH agents within the Ghanaian academic setting. Finally, the results of the study advance QH theorising by identifying the role of QH agents in developing ICT and HOT skills of accounting graduates in Ghana.

1.8 RESEARCH DESIGN AND METHODOLOGY

The current study followed a qualitative approach using a DBR methodology. A qualitative research approach is useful when the aim of the researcher is to investigate a phenomenon, and the researcher needs to connect faithfully with the research

participants (Sutton & Austin 2015:230). The aim of the current study was to investigate the issues of ICT and HOT skills among accounting graduates in Ghana; consequently, the qualitative research method was deemed suitable for the present study. The adoption of the qualitative approach for the current study further permitted a variety of questions to be posed to research participants to freely share valuable information on the phenomenon under consideration (Creswell 2014:18).

In addressing the research problem and achieving the objectives of the study, a pragmatism paradigm was followed, as recommended by Kaushik and Walsh (2019:4). This approach granted the researcher the autonomy to freely chose different research methods and procedures to best respond to the research questions (Alise & Teddlie 2010:106; Creswell 2014:10). The approach allowed for the use of a variety of data collection methods to understand the relevant ICT and HOT skills required by accounting graduates in Ghana to enhance their employability. Several researchers agree that pragmatism is a suitable paradigm that underpins DBR (see Barab & Squire 2004:6; Juuti & Lavonen 2006:56).

DBR follows a sequence of approaches with the aim of developing new theories, artefacts and practices that account for and potentially influence learning and teaching in naturalistic settings (Barab & Squire 2004:2). DBR has the advantage of addressing complex problems in educational environments to build a strong link between educational research and real-world problems (Amiel & Reeves 2008:34; Sari & Lim 2012:28).

For in-depth and wide investigation, two major data collection methods were employed, namely document analysis and semi-structured face-to-face interviews. Document analysis and semi-structured face-to-face interviews took place during the preliminary and prototyping or development phases of the DBR project. Documents on the national ICT policy and the accounting curricula of the selected universities were examined and analysed to generate data relevant for the study. Document analysis gave the researcher information and ideas on questions that could be asked during the data collection and analysis phases (see Bowen 2009:31–32). Moreover, the results of the document analysis assisted the researcher to do the reiterative steps in the DBR. Semi-structured face-to-face interviews were conducted with the QH agents, namely accounting academics, accounting graduates, employers and government. Details of

the study participants and the sample considered for this study are provided in sections 4.5 and 4.6 respectively.

The questions for the interview were developed from the research questions to investigate and receive more comprehensive views on ICT and HOT skills, including how graduates use these skills in their daily work and how academics teach these skills. The qualitative data was analysed using content analysis procedures. Qualitative content analysis is the process of condensing data into themes on the basis of reasonable deductions and interpretations (Erlingsson & Brysiewicz 2017:95). Thematic analysis was conducted using computer-assisted qualitative data analysis software (also known as 'caqdas') ATLAS.ti™ 9. This made it easier for the researcher to identify similar patterns and themes to interpret how the existing ICT and HOT skills are (or are not) enabling employment of accounting graduates in Ghana.

1.9 SCIENTIFIC RIGOUR AND TRUSTWORTHINESS OF THE STUDY

Issues of scientific rigour and trustworthiness are critical considerations in determining the credibility of research findings. The current study employed the strategies proposed by Guba and Lincoln (1989:300) to strengthen the quality and trustworthiness of the study. Table 1.1 provides the summary of these strategies. Detail about their applications will be presented in section 4.11.

Table 1.1: Strategies to ensure trustworthiness of the current study

Trustworthiness	Explanation	How trustworthiness was ensured
Credibility	The extent to which the research results represent the views of the participants to afford trustworthiness of the research findings	Data was collected through document analysis and semi-structured face-to-face interviews with government, academics, employers and graduates. Regular debriefing sessions were conducted with supervisors during the data collection and analysis stages to receive feedback.
Dependability	The consistency of the findings of the study should the study be replicated with the same participants or within similar contexts	Steadiness and resemblances in participants' opinions for consistency were established. The research processes were documented to allow future researchers to repeat the work.
Transferability	The application of the findings of the study in a particular situation but other similar contexts	Detailed descriptions of the study locations, participants and data collection procedures of the study were made to allow comparisons to be made. Detailed descriptions of the research findings are provided.
Confirmability	The extent to which the findings of a particular study could be confirmed by other researchers	Findings were based on the participants' experiences and views rather than on those of the researcher. An audit trail in the form of transcripts to serve as evidence of the interviews was maintained.
Authenticity	Integrating the values of participants in order to empower them to improve their situations	All participants had the opportunity to express their opinions on different aspects of the study. Statements provided by research participants were analysed. Confidentiality of data collected and fair interpretation and reporting of data were ensured.

Source: Author's own compilation (based on Guba & Lincoln 1989:300; Lincoln, Lynham & Guba 2011:180).

1.10 ETHICAL CONSIDERATIONS

In conducting the current study, key principles were observed and maintained to respect and uphold the rights of the participants. These principles, details of which are discussed in section 4.12, are summarised below:

- adherence to ethical principles, including an approval from the Ethics Review Committee of the College of Accounting Sciences (CAS) of the University of South Africa (Unisa);
- obtaining permission from the individual participants as well as the employers of research participants, where applicable;
- ensuring that transcripts and notes were safely kept during the process of collecting data;
- some ethical concerns with reference to research participants and other people that were taken into consideration, were their dignity, rights and welfare, anonymity and confidentiality, plagiarism (Akaranga & Majid 2016:3–7; Haggerty 2004:395; Halej 2017:3–4).

1.11 DELINEATION OF THE STUDY

The main purpose of this study was to examine the relevant ICT and HOT skills required of accounting graduates in Ghana. In addition to considering HOT skills, this research concentrated on examination of ICT skills, such as students' knowledge of Microsoft computer and accounting software packages. This study also considered advanced ICT skills, such as cloud computing, big data and analytics. The research was carried out in Accra, Cape Coast and Kumasi, which are the respective capital cities of the Greater Accra, Central and Ashanti regions of Ghana (refer to Figure 2.2). These cities were selected for the study because they comprise the hub of universities and industries in Ghana.

1.12 LIMITATIONS OF THE STUDY

In the first place, this study was conducted in Ghana only, and focused on the top five public universities in the country. The findings are not necessarily applicable to other universities in the country; however, other institutions of higher education may also benefit from the results. In addition, professional institutions who are involved in accounting education, may also benefit from the study. Also, the results of the study depend on the honesty of research participants. Participants could have been biased and may have expressed comments not reflecting the real situations and best practices.

Notably, the researcher spent considerable time pursuing participants through telephone calls and e-mail messages to obtain their consent for the collection of data. Further limitations of the current research are provided in section 6.11.

1.13 DEFINITION OF TERMS AND CONCEPTS

The explanations below are provided to ensure a general understanding of the operational definitions for the key terminologies used in the study.

Accounting education

This type of education is concerned with attracting and equipping students with the knowledge and skills required to provide accurate accounting and financial information for making decisions in business (Low et al. 2013:1).

Information technology (IT)

Different meanings have been given for the concept 'information technology'. In this thesis, IT refers to the computing and telecommunication hardware and software technologies of an organisation, which provide an automated means of information procession and communication (Heeks & Molla 2004:1).

Information communications technology (ICT)

ICT refers to all technical equipment required for converting, processing, saving and transferring different types of digital information (Attaran 2003:442), and comprises data communication, voice telephony, computer and similar fields of technology (Niebel, Kopp & Beerfeltz 2013:6). ICT knowledge and skills are the relevant knowledge and skills in the application of computers and telecommunication for storing, retrieving, transmission and manipulation of data (Ogundana et al. 2015).

Employability

Employability is the set of skills and qualities required to secure employment (Rowe & Zegwaard 2017:88). This implies that any individual who has the capacity to work has developed the required knowledge, skills, technology and flexibility to enable him or her to secure and stay in employment throughout his or her working life (Tran 2016:61).

Graduateness

'Graduateness' is a term used to describe the general learning outcomes of university education (Steur, Jansen & Hofman 2016:7). It comprises the complex set of skills, subject-specific knowledge and attributes, which equip graduates to perform effectively and efficiently in the workplace (Glover, Law & Youngman 2002:303).

Higher-order thinking (HOT) skills

HOT skills involve not only the ability to think, recall, restate or recite, but also the ability to connect different concepts, interpret, reason, solve problems, communicate and make the right decisions (Supeno, Astutik, Bektiarso, Lesmono & Nuraini 2019:1). HOT skills comprise the ability to think critically, creatively, analytically and systematically, and to make fair and useful judgments (Mrah 2017:239). Anderson et al. (2002:215) define HOT skills to be analysing, evaluating and creative skills.

Triple helix (TH) innovation model

The TH model describes the interaction between government, academia and industry and their associated initial roles, which involve academia engaging in teaching and research, industry producing commercial goods and services, and government, for instance formulating policies, providing financial support and regulating the market (Afonso, Monteiro & Thompson 2010:5).

Quadruple helix (QH) innovation model

QH means adding to the TH innovation model a 'fourth helix' (Carayannis & Campbell 2009:206). To enhance sustainable development in the twenty-first century, Carayannis and Campbell (2009:206–207) added the "public" as the fourth helix. The QH innovation model of Carayannis and Campbell (2009:207) therefore consists of four agents, namely government, academia, industry and the public. In the context of this study, the QH innovation model was adapted to explain how government, academics, employers and accounting graduates, the four innovation agents can work together for the development of industry-relevant education, training programmes and opportunities to enhance employability of accounting graduates in Ghana.

1.14 STRUCTURE OF THE STUDY

This thesis comprises six chapters. Chapter 1 provided the background to the employment challenges of accounting graduates in Ghana in both broad and specific terms leading to the formulation of the research questions and objectives of the study. The chapter also explained the justification, significance, delineation and limitation of the study. In addition, the research design and methodology as well as issues of scientific rigour and trustworthiness that are critical considerations in determining the credibility of the findings of a study were highlighted. Finally, some of the key terminologies used in the study were conceptualised.

Chapter 2 contextualises accounting education and the ICT and HOT skills requirements of accounting graduates. The chapter explains the concept of accounting education leading to the contextualisation of accounting education in Ghana with greater emphasis on university accounting education. The 4IR and its influence on the accounting profession, employability challenges of accounting graduates and the different skills requirements of accountants in the twenty-first century with special focus on ICT and HOT skills are discussed.

Chapter 3 describes the theoretical framework of the current study in the context of ICT and HOT skills. The focus is on the QH innovation model of government, academia, employers and graduates collaborative relationships. The TH innovation model of government–academia–industry relations will be explained extensively to enhance the understanding of the QH innovation model. In addition, the chapter reviews Bloom’s revised taxonomy of educational objectives framework forming the basis of HOT skills, and concludes with the deduction of the conceptual framework for developing the relevant skills of accounting graduates in Ghana to satisfy the demands of employers.

Chapter 4 is devoted to a detailed discussion of the methodological assumptions supporting data collection and analysis. Chapter 5 presents the research findings and responses to the research questions reflecting important verbatim quotations.

Chapter 6 interprets the findings, answers the research questions, and provides conceptual conclusions. This last chapter of the study also touches on the contributions of this study to knowledge, presents a summary of the thesis and the limitations of the

study, and makes recommendations for future research. The outline of this thesis is depicted in Figure 1.1.

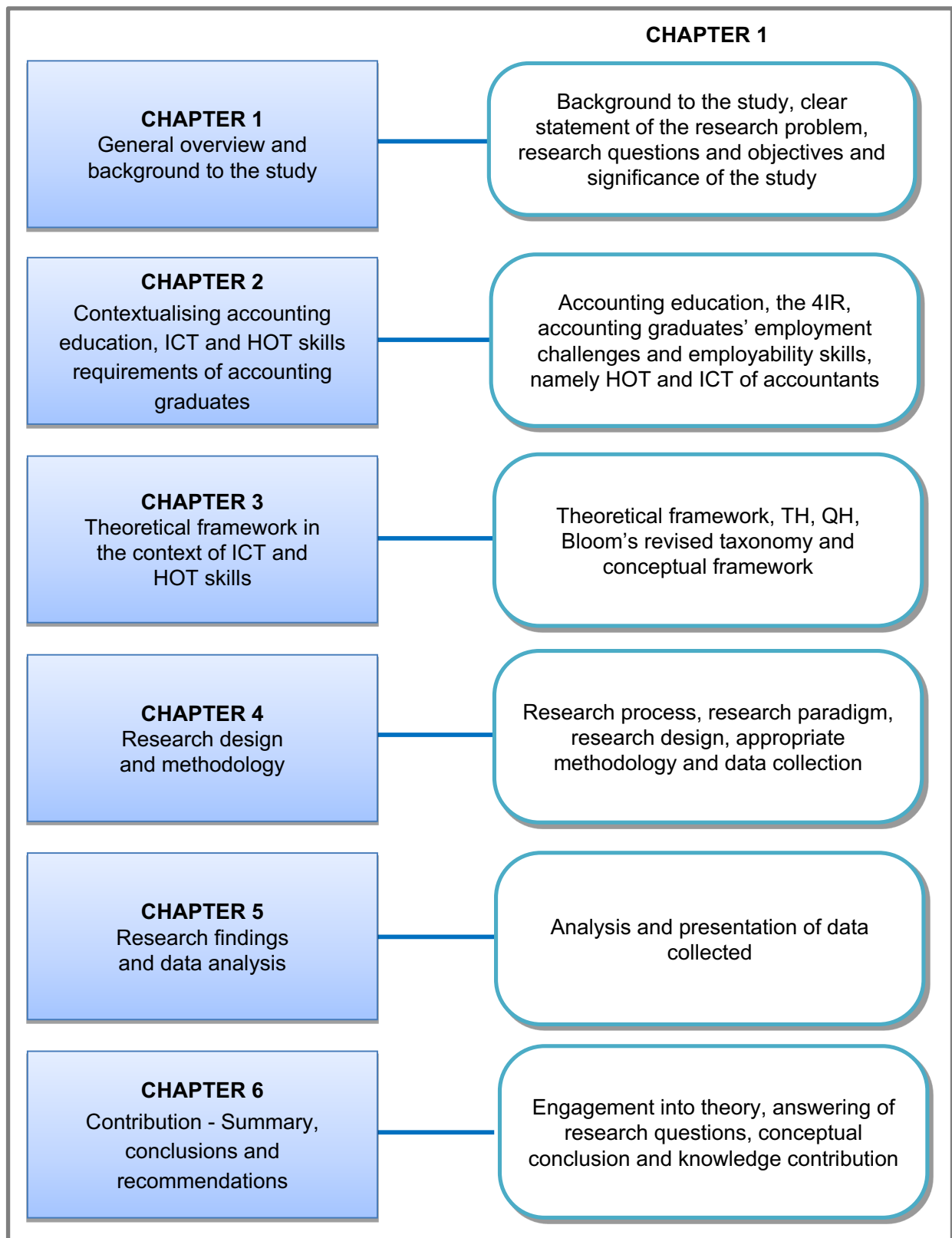


Figure 1.1: Structure of the study

Source: Author's own compilation

1.15 CHAPTER SUMMARY

This chapter has revealed that most newly qualified accounting graduates in Ghana are struggling to secure sustainable employment due to a lack of adequate ICT and HOT skills. With the arrival of the 4IR where technology and digitisation will significantly affect the tasks performed by accountants, this will further widen the demand–supply gap in terms of ICT and HOT skills. A preliminary review of the literature revealed that limited research has been conducted on the ICT and HOT skills of accounting graduates in Ghana from a holistic and overarching perspective. In order to fill this obvious gap in the literature, the current study set out to determine the ICT and HOT skills accounting graduates in Ghana need for their career by using the QH innovation model (see Carayannis & Campbell 2009) and Bloom’s revised taxonomy of educational objectives model (see Anderson et al. 2002).

In addressing the research problem and achieving the objectives stated in this chapter (refer to sections 1.2 and 1.3), the current study adopted a DBR qualitative approach. Issues of quality and trustworthiness of this study were addressed employing the five principles of credibility, dependability, transferability, confirmability and authenticity proposed by Guba and Lincoln (1989). Finally, issues of ethical concern were addressed by adhering to ethical principles, including approval from the Ethics Committee of the College of Accounting Sciences (CAS), Unisa and obtaining permission from the individual participants.

Chapter 2 will contextualise accounting education and the ICT and HOT skills requirements of accounting graduates. It will also explain the 4IR and its influence on the accounting profession in general, followed by detailed description of the employability challenges of accounting graduates in Ghana as well as the different ICT and HOT skills requirements of accountants for sustainable employment with the arrival of the 4IR.

CHAPTER 2

CONTEXTUALISING ACCOUNTING EDUCATION, ICT AND HOT SKILLS REQUIREMENTS OF ACCOUNTING GRADUATES

2.1 INTRODUCTION

In Chapter 1, the problem of most newly qualified accounting graduates in Ghana in finding employment due to a lack of adequate ICT and HOT skills was discussed. The current study set out to determine the ICT and HOT skills deemed essential by the accounting profession in Ghana to enable universities to develop more relevant accounting curricula than the current curricula to enhance the employability of accounting graduates in the country during the 4IR.

This chapter contextualised accounting education and the ICT and HOT skills requirements of accounting graduates. In doing so, books, academic articles, and other research works relative to the research problem under investigation were reviewed and analysed critically. This enabled the researcher to synthesise prior knowledge on the topic under study to identify how the issues were previously dealt with and to identify interests expressed by other researchers and experts in the field of accounting education as well as the business sector (Snyder 2019:333).

The chapter begins with the concept of accounting education, specifically accounting education in the Ghanaian context as well as the influence of 4IR on the accounting profession. In addition, the employability challenges of accounting graduates are discussed leading to the identification of different skills requirements of accountants in the twenty-first century focusing on ICT and HOT skills. These skills will be discussed in detail demonstrating their importance to the accounting profession currently and in future. Figure 2.1 shows a visual representation of the structure of Chapter 2, and its position in the context of the thesis.

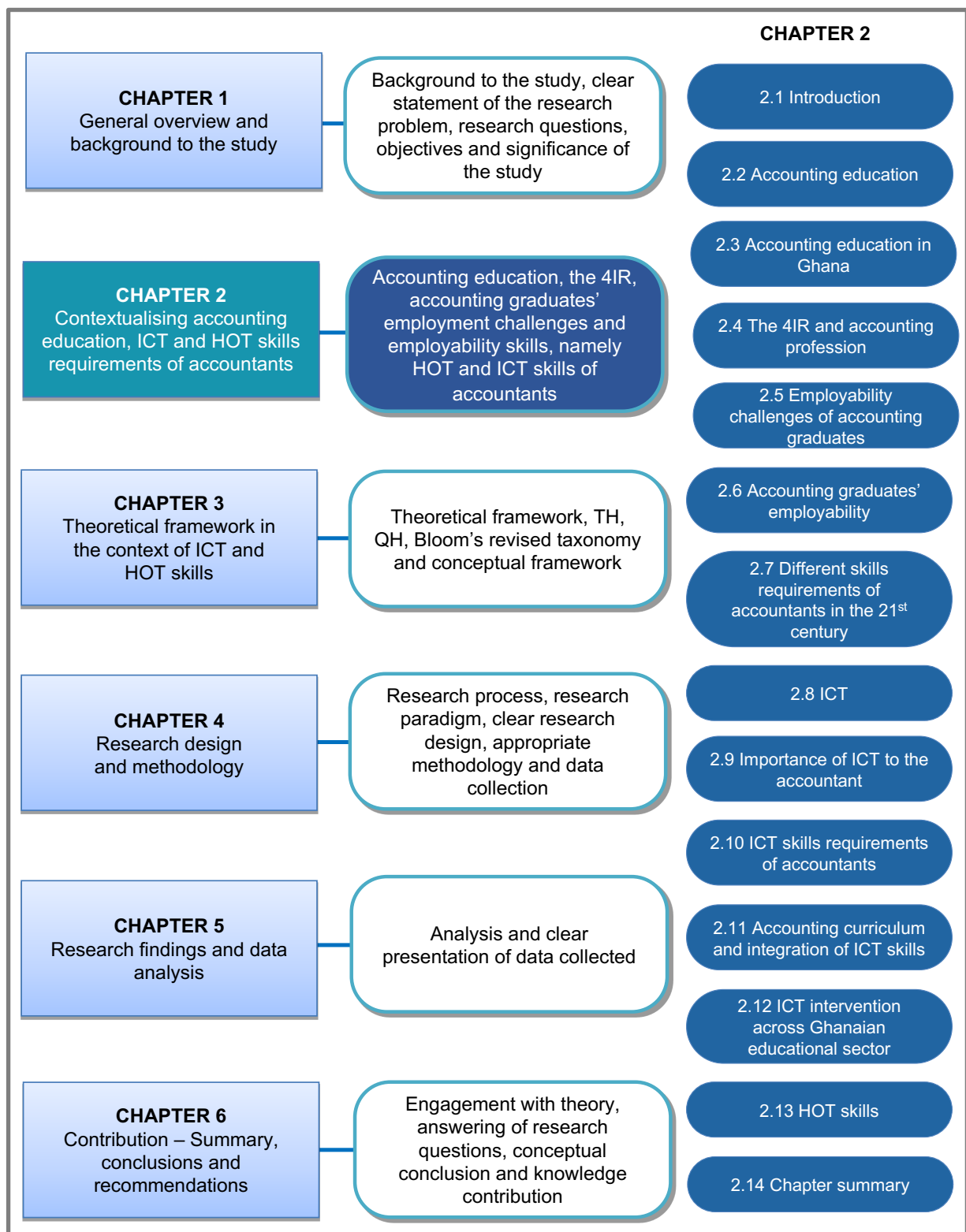


Figure 2.1: Structure of Chapter 2

Source: Author's own compilation

2.2 ACCOUNTING EDUCATION

The term 'accounting education' lacks a precise definition in the accounting literature due to the ever-changing global business environment and the related requirements set by the accounting profession (Dellaportas 2019:121). Generally, accounting education is about 'accounting' and 'education' in which students are taught the theories and practices of accounting using various types of teaching and learning methods (Helliari 2013:513). Littleton (2016:47) defines accounting education as the process whereby an understanding of the concepts and principles of accounting is taught, normally including the acquisition of the general knowledge relating to the theory and practice of the subject. This is seen as an educational process, ultimately to prepare students for the accounting profession that has significantly influenced the growth and development of business (Maali & Al-Attar 2020:3). Accounting education is concerned with attracting and equipping students with the knowledge and skills required to provide accurate accounting and financial information for decisions in business (Low et al. 2013:1). Ogundana et al. (2015:115) add that accounting education theoretically and practically trains students to acquire a set of knowledge, skills and competencies required for performing calculations needed for business and financial decisions.

It has always been very difficult to stipulate the purpose of accounting education as it changes in accordance with global business conditions, the requirements of the accounting professions and the ever-growing demand for accountants (Low et al. 2013:2). The main objective of accounting education, as seen by the International Federation of Accountants (IFAC) (2003:11) has to do with developing people capable of providing high-quality accounting services and making meaningful contributions to the organisations where they work and the accounting profession as a whole.

IFAC (2018:4) outlines the following specific characteristics as the driving force behind any accounting education process:

- providing a basic understanding of the conceptual framework underlying the measurement and communication of economic data;
- providing the future accountant with the technical competence for effective measuring, assimilation and communication of economic data primarily for external use;

- providing an understanding of alternative models for measuring and communicating economic data primarily for external use;
- being relevant to current problems and adaptive to changing social and economic conditions;
- cultivating a keen, analytical, inquiring mind; and
- providing the student an incentive to grow and keep pace with ever-changing financial issues, conditions, sources and ideas.

The definition of accounting education has changed from teaching purely technical skills to include soft skills (also HOT and ICT skills) with the emphasis on equipping accounting graduates with the capability to adapt to the changing workplace environment, and handle personal and professional challenges, which they may encounter (Hassall, Joyce, Montaña & Anes 2005:386; Low et al. 2013:2). According to Dellaportas (2019:119), the debate on accounting education has currently shifted from the purpose and content of accounting education to the process of teaching and learning where the student is encouraged to play an active and independent role in the learning process. By this, the student becomes self-directed in the learning process, acquires knowledge through his or her own efforts and eventually develops enquiry and innovative skills.

Low et al. (2013:3) argue that accounting education does not only play a significant role in the survival of businesses and industries, but also provides a requisite for economic, political and social developments of a nation. Therefore, it can be concluded that, through accounting education, individuals become highly trained professionals capable of contributing significantly to the overall performance of an organisation, or of establishing their own businesses and employ others, which will eventually help to reduce unemployment.

Accounting itself, as a subject, is described as the language of business, possibly a facilitating process for business or a fundamental variable upon which business can thrive. Part of the purpose of accounting education is to assist stakeholders to appreciate the importance of the close interrelationship between accounting and business management (Littleton 2016:49). The close relationship between accounting and business and its significance to business are based on the closeness between accounting and money (Dellaportas 2019:119). Accounting traces the use of money in

business, which is a crucial variable at the heart of business, one which makes business either succeed or fail (Littleton 2016:49). In the next section, the focus is on accounting education in Ghana.

2.3 ACCOUNTING EDUCATION IN THE GHANAIAN CONTEXT

Ghana is a country located in western Africa on the Gulf of Guinea and borders Togo, Cote d'Ivoire, and Burkina Faso (refer to Figure 2.2). Ghana formerly known as the Gold Coast, has become the first sub-Saharan country to gain its independence in 1957. It has been a stable democracy since 1992 taking major strides towards democracy under a multi-party system (Briney 2019:1). Ghana's population is about 31 million comprising approximately 15 million females and 16 million males. Ghana's population age structure is dominated by young people (15–35 years) constituting about 38.2% in 2021 (Ghana Statistical Service 2022:1). The unemployment rate among the population, 15 years and older, is 13.4% and is higher for females (15.5%) than males (11.6%) (Ghana Statistical Service 2022:58). Ghana has a hugely rural population that is dependent on subsistence agriculture. The economy is a mixture of private and public enterprises. Ghana's GDP growth is estimated at 5.0% in 2021, of which 60% is derived from the services sector (Sasu 2022:1).

In Ghana, accounting education is offered as part of the business programmes of different educational institutions, such as in secondary schools or at technical, university and professional level. Detailed reviews of these levels are provided in the paragraphs that follow.

2.3.1 Accounting education at secondary or technical level

Accounting education at secondary, tertiary and technical level in Ghana started in the 1960s when candidates mostly went through informal private and self-tuition, or they studied at formal private institutions in the form of commercial and vocational schools. This level of education, which was administered and certified by foreign bodies, was a prerequisite for undergraduate programmes. For instance, there were two popular institutions: the Royal Society of Arts and the London Chamber of Commerce. Later, the Royal Society of Arts examinations were localised as Ghana Commercial Examinations and categorised into two parts: the General Business

Certificate Examinations and the Advanced Business Certificate Examinations, both being administered by the West African Examinations Council. The General Business Certificate Examinations was discontinued in 1974 because they were seen as purely local examinations, which did not compare well internationally. Most of the education did not provide the required general knowledge background, which is recognised these days as essential for a good professional accounting career. The emphases were on the traditional 'commercial' subjects of typing, commerce, bookkeeping, business methods, etcetera without any interest in general subjects, apart from English and business mathematics (Onumah, Gariba, Packeys & Agyapong 2012:82).

In place of the General Business Certificate Examinations, Ghana Commercial Examinations was introduced at the ordinary level (O-Level) where the terminology changed to either secondary or technical education, and students offered some accounting and business subjects. Finally, the advanced level (A-Level) was added and the O-Level accounting course became a prerequisite for the A-Level accounting course. The A-Level accounting courses comprised theory of financial accounting and costing and financial accounting. In addition, students had to pass a general paper examination, also administered by West African Examinations Council. The main objective of accounting education at this level was to equip candidates with knowledge of the principles of accounts and their application in the preparation of accounting information needed in modern business (Anyane-Ntow, Gharthey & Ndzinge 1992:39; Onumah et al. 2012:82). The current position of secondary level education shifted from all the Ghana Commercial Examinations O- and A-Level examinations to Senior High School education (Bingab, Forson, Mmbali & Baah-Ennumh 2016:3).

The current position shifted from all the Ghana Commercial Examinations O- and A-Level examinations to the senior high school education. The adoption of this educational system has reduced the period for the secondary school education to three years; hence, hastening the university educational process for students (Bingab, Forson, Mmbali & Baah-Ennumh 2016:3).

2.3.2 Accounting education at university level

Acquiring a university degree in accounting is one of the avenues that lead to a career within the accounting and finance industry (Heang, Ching, Mee, Huei & Heang

2019:1064). University accounting education started in Ghana in 1952 with the establishment of the College of Technology in Kumasi (currently Kwame Nkrumah University of Science and Technology). The Commerce Department of the College of Technology in Kumasi was responsible for training accountants to service the needs of foreign companies then operating in the territory and to prepare students to sit for examinations conducted by ACCA and the Chartered Institute of Secretaries, all in the United Kingdom. Consequently, the courses offered by the Commerce Department of the College of Technology in Kumasi were basically drawn from programmes of these professional bodies and were offered over a period of five years (Anyane-Ntow et al. 1992:40).

As a result of an urgent requirement for accounting education to be oriented towards the needs of the nation, the Government of Ghana in 1959 established the College of Administration in Achimota, a town in the Accra Metropolitan District of Ghana (Anyane-Ntow et al. 1992:41). The college, which was later integrated into the University of Ghana, was tasked to train students in commerce and public administration (Anyane-Ntow et al. 1992:41). The Achimota College of Administration (now School of Administration) introduced a three-year course leading to the awarding of a Bachelor of Science Honours Degree in Administration with diverse areas of specialisation, including accounting (Awayiga et al. 2010:144). In 2004, the name of the School of Administration was changed to the University of Ghana Business School to reflect the current trend in business education worldwide (Onumah et al. 2012:81).

By 31 March 2021, there were ten accredited public universities in Ghana that offer four-year accounting degree courses of varying descriptions, such as Bachelor of Science (BSc) in Accounting, Bachelor of Commerce Degree (BCom) in accounting; and Bachelor of Business Administration (BBA) in accounting (Ghana Tertiary Education Commission [GTEC] 2021:13), namely:

- University of Ghana;
- Kwame Nkrumah University of Science and Technology;
- University of Cape Coast;
- Ghana Institute of Management and Public Administration;
- University of Professional Studies;
- University of Education;

- University for Development Studies;
- SD Dombo University of Business and Integrated Development Studies;
- University of Skills Training and Entrepreneurial Development; and
- Ghana Communication Technology University.

Some of these universities also offer other courses in accounting at postgraduate level, such as Master of Business Administration (MBA), Executive MBA, Master of Science (MSc), Master of Philosophy (MPhil) and PhD. As mentioned previously (refer to section 1.1), these universities focus on such distinct areas of studies as financial accounting, public sector accounting, management accounting techniques, management information systems, taxation, auditing and investigation procedures as well as general education courses. The content of these courses and conditions for effective functioning of the universities and maintaining acceptable academic and professional standards are approved by the NAB and NCTE (Kamran, Liang & Trines 2019:4). It must be noted that the NAB and the NCTE have been brought together as one body known as the Ghana Tertiary Education Commission (GTEC) under the new Education Regulatory Bodies Act (No. 1023 of 2020) (Kwegyiriba, Agyepong & Mensah 2021:54). The aim was to resolve the replicating responsibilities of the two educational sector regulatory bodies (the NAB and the NCTE). Consequently, GTEC will be used throughout this thesis instead of the two defunct bodies. Figure 2.2 shows the accredited public universities in Ghana that offer accounting degrees.

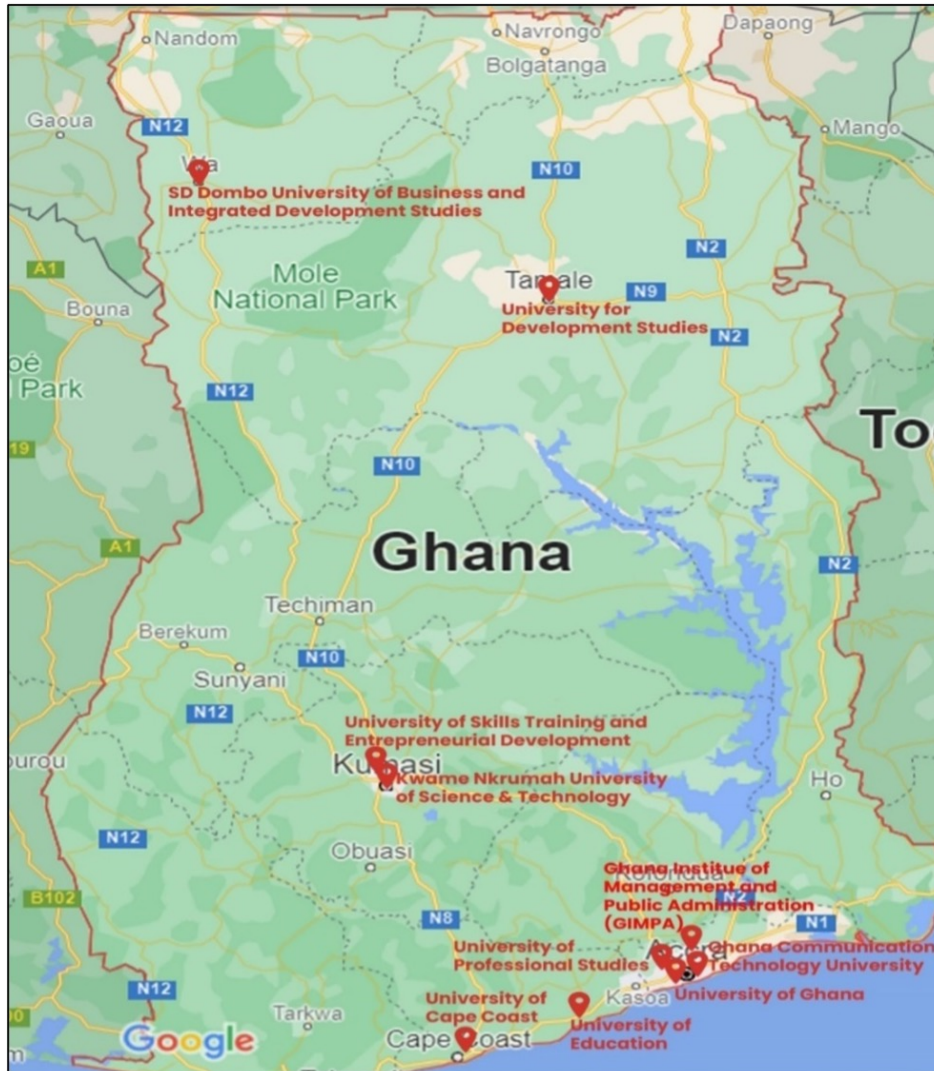


Figure 2.2: Map of universities offering accounting degrees in Ghana

Source: Adapted from Maphill (2021:1).

Although university admission criteria in Ghana may vary from one institution to the next, the minimum admission requirements are set by GTEC. All candidates must obtain at least six credits in the West African Senior School Certificate Examination subjects, including English and Mathematics (Kamran et al. 2019:3).

There are ten accredited technical universities and various accredited private universities in Ghana that offer accounting degree programmes. However, the technical universities were not taken into account in this study because their accounting degree programmes were still at the infant stage at the time of this study. The private universities were also not included in this study since they were not governed by the Government of Ghana at the time.

The main aim of accounting education at undergraduate level, specifically in Ghana, is to provide students with knowledge of accounting principles for the purpose of preparing and communicating financial information to managers of organisations and other stakeholders for decision-making (Anyane-Ntow et al. 1992:58; Assenso-Okofu, Ali & Ahmed, 2011:471; Bingab et al. 2016:7; Onumah et al. 2012:80). The accounting programmes also offer a sound foundation for postgraduate studies for an additional qualification (Anyane-Ntow et al. 1992:58; Onumah et al. 2012:81). In Ghana, it is very common for students to study concurrently both for an undergraduate degree and a professional accounting qualification. This may be undertaken within accredited tertiary institutions, or more recently at private institutions.

2.3.3 Accounting education at the professional level

According to Assenso-Okofu et al. (2011:470), professional accounting institutions play important roles in ensuring the quality of accounting education in any country. Accounting education and training in Ghana started when individuals prepared themselves privately to study and write the international professional examinations of ACCA, CIMA and the Institute of Chartered Accountants England and Wales. (ICAEW). Those were individual efforts at the time when professional accountants were needed in the Ghanaian economy especially as economic development started to take shape in most African countries (Bingab et al. 2016:8). In response to the call to train more professional accountants for the Ghanaian economy locally at a more affordable cost compared to the cost of acquiring professional education and training overseas, ICAG was established (Uche 2007:21). It is now prohibited for a person to call him- or herself an accountant unless he or she is a registered member of ICAG (ICAG 2020:16).

ICAG was established by an Act of parliament, the Chartered Accountants Act (No. 170 of 1963) (ICAG 1963:2; Mbawuni & Nimako 2015:66), as the sole regulator of the accountancy profession in Ghana (ICAG 1963:2). The object of ICAG is also stated in section two of the new Chartered Accountants Act (No. 1058 of 2020) (ICAG 2020:5). ICAG is a member of IFAC, the Pan African Federation of Accountants (PAFA), and the Association of Accountancy Bodies in West Africa (ABWA), and is the only recognised organisation in charge of the regulation, shaping and directing of the accountancy profession in Ghana (ICAG 2020:5; Uche 2007:15). Therefore, ICAG has

a legal responsibility to regulate the accounting profession in a manner that encompasses the accounting curriculum, acceptance of individuals into the profession, as well as the supervision and control of accountants' conduct in practice (Onumah et al. 2012:82).

Currently, a candidate needs to pass three levels of examinations in 15 extremely technically demanding subjects and complete a mandatory period of three years' practical experience before he or she can qualify as a member of ICAG (ICAG 2018:5). The practical experience may be obtained either before the professional accounting education study programme, at the same time as the professional accounting education study programme, or after the professional accounting education study programme (ICAG 2020:11). Continuous professional development (CPD) is seriously encouraged and monitored and is compulsory for all members with sanctions for non-compliance (ICAG 2022:1). Figure 2.3 shows the ICAG professional qualification syllabus 2019–2024.

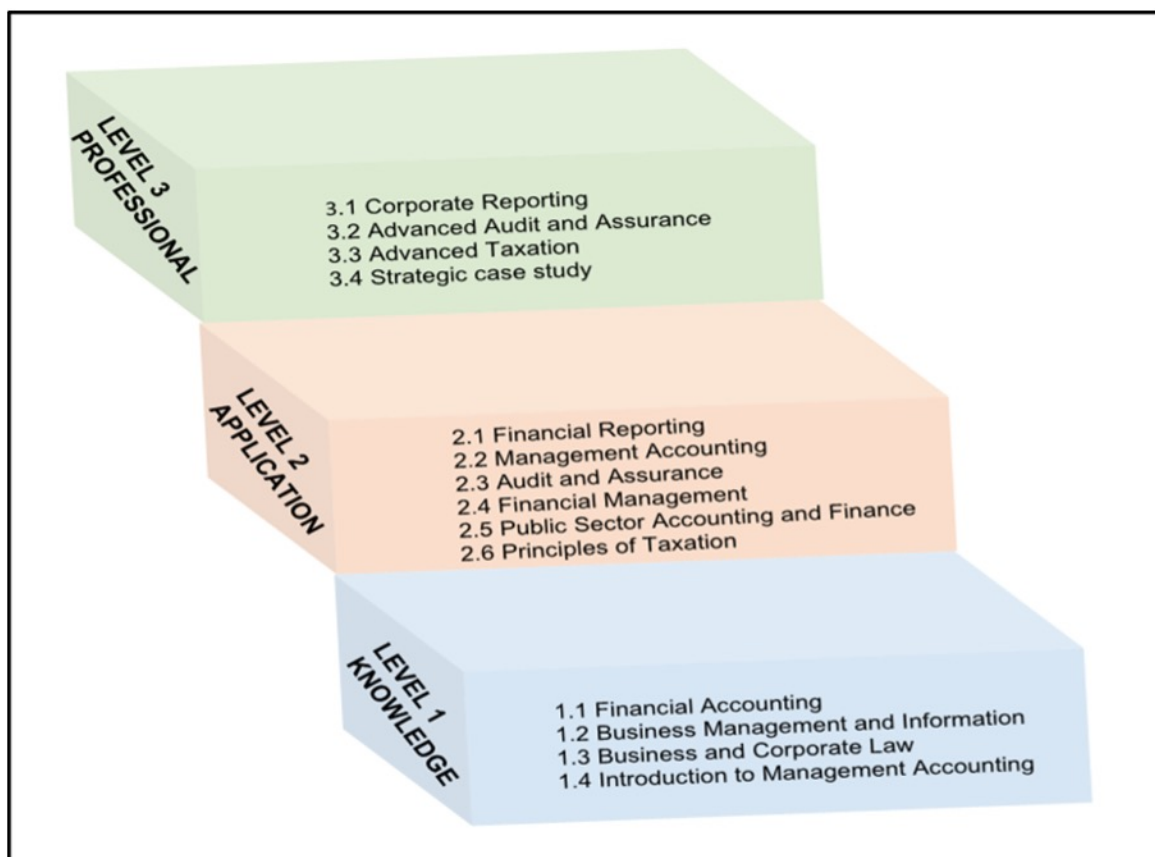


Figure 2.3: ICAG professional qualification syllabus structure

Source: ICAG (2018:6–8).

A candidate with a bachelor's degree in accounting from an accredited university is exempted from all the level one papers in addition to Auditing and assurance and Principles of taxation papers in level two (ICAG 2018:10).

Section three of the Chartered Accountants Act (No. 1058 of 2020) (ICAG 2020:5) prescribes the following specific functions of ICAG:

- regulate the practice of accounting in the country;
- certify persons who can practice as auditors;
- prescribe and approve courses of study for the accounting profession;
- conduct and provide for the conduct of qualifying examinations for membership of ICAG;
- prescribe and maintain standards of professional conduct for members of ICAG and educate members of this institute on the methods and practices necessary to maintain the standards of professional conduct;
- monitor and evaluate the conduct of accounting practice by members of ICAG and prescribe reports to be submitted by members in relation to the conduct of accounting practice;
- establish a disciplinary code and enforce the disciplinary code among members of ICAG;
- promote and preserve the common interest and professional independence of the members of ICAG; and
- organise CPD courses for members of ICAG including theory and practice of accounting, financial management and related disciplines as a conditional precedent for renewal of membership.

It should be noted that neither the old Chartered Accountants Act (No. 170 of 1963) (ICAG 1963:2) nor the new Chartered Accountants Act (No. 1058 of 2020) (ICAG 2020:5) has a competency framework that refers to ICT and HOT skills. Section 2.4 below examines the 4IR and its influences on the accounting profession, as well as the skills accounting graduates in Ghana need to acquire to gain employment in an accounting capacity and contribute to the growing economy of the country.

2.4 THE 4IR AND THE ACCOUNTING PROFESSION

Studies indicate that the world is in the 4IR (see, for instance, Lydon 2020:1; World Economic Forum [WEF] 2018:7). The '4IR' is a term used to describe a world defined by the set of a broad spectrum of mutually supporting digital technologies with considerable advances in computing capacity and the dexterity to network data processing devices in the most cost-effective manner (Dean & Spoehr 2018:166). Liu and Xu (2016:5) describe the 4IR as the revolutionary change that occurs when IT proliferates in all industries. The 4IR encompasses a wide range of concepts, such as digitalisation, automation, standardisation, dynamic and secure networks as well as incremental developments in mechanisation and general innovation (Ustundag & Cevikcan 2018:4).

Davies (2015:2–3) states that the 4IR relies greatly on several innovative new technological advancements, namely:

- the utilisation of ICT to digitise information and incorporate systems at every stage of product development and usage;
- cyber-physical systems, which make use of ICTs for monitoring and controlling physical procedures and systems;
- network communications, collecting, analysing and utilising large amount of data; and
- improved ICT-enabled support for employees, comprising robots and intelligent equipment.

It is expected that this revolution will lead to a significant decrease in the labour force, which may in turn give rise to higher rates of unemployment, specifically among graduates worldwide (Fernandez & Aman 2018:128; Frey & Osborne 2017:268). In addition, students who are currently at primary, secondary and tertiary levels may not be able to find employment in the fields for which they are studying (Omar & Hasbolah 2018:16). This may be because technology-based equipment, such as robotic process automation (RPA) will be widely used in carrying out various business and administrative tasks more efficiently and at a faster rate than humans can do. Lacity and Willcocks (2016:41) describe RPA as software that uses technology-based equipment to facilitate the automation of processes and tasks. RPA is a software program that imitates the human worker, with the objective of tackling structured work

fast and in a cost-effective manner (Asatiani & Penttinen 2016:3). The most important effect that RPA has on the accounting profession is in the automation of regular manipulation of accounting data that is usually performed manually (Fernandez & Aman 2018:128).

On the other hand, Frey and Osborne (2017:269) argue that, even though the 4IR poses a major challenge to traditional occupations, including the accounting profession, it also provides prospects for people – especially accountants – who are ready to accept it. According to Rkein, Issa, Awada and Hejase (2020:189), new work opportunities will emerge that will need a new skill set, particularly jobs that demand higher-order thinking. Villanova (2019:1) emphasises that the 4IR will release the business and financial analyst, manager and entrepreneur within accountants, thereby emancipating them from the ordinary and repetitive work that occupy most of their time.

According to Islam (2017:1), the 4IR will significantly affect the accounting profession and professional accounting organisations, to which their members, and training institutions have to respond. In the first place, professional accountants will use more sophisticated and advanced technologies to improve their conventional working methods. Secondly, continuous globalisation will provide a window of opportunity on one hand, and challenges on the other hand, for members of the accounting profession. Thirdly, an increasing number of regulations and the corresponding disclosure rules, will significantly affect the accounting profession for many years (Islam 2017:1).

As far as Burritt and Christ (2016:30) are concerned, the 4IR will enable accountants to obtain quality data from various sources easily, which were previously difficult to access on a timely basis to facilitate planning and decision-making by managers and other stakeholders. It will also increase the relevance and credibility of financial reporting using self-checking and self-auditing systems (Mohamed 2018:19). Ghani (2019:20) posits that with 4IR, accountants will be less involved in automated activities, as they will need to focus on the bigger-picture strategies of companies. Therefore, for the purpose of remaining in high demand, accountants must embrace the changes and be well versed in the use of the latest technologies (Akhter 2018:152).

To enhance the employability of their graduates during the 4IR, universities should modify existing course contents or introduce new courses to develop the digital skills that employers will require (Hoffman 2017:2). Universities should also invest in technology for practical training and skills development and provide experience with performance in the 4IR considerations (Islam 2017:1).

The next section presents the employability challenges of accounting graduates – specifically in the Ghanaian context – and how these challenges can be addressed for the benefit of the graduates, their parents and the country as a whole.

2.5 EMPLOYABILITY CHALLENGES OF ACCOUNTING GRADUATES IN GHANA

The employability of Ghanaian graduates is becoming a concern to many stakeholders, especially parents and policymakers, despite the strong economic growth in the country in recent times (Ampadu-Ameyaw, Jumpah, Owusu-Arthur, Boadu & Mahama 2020:2; Baah-Boateng 2018:1). A large number of graduates with bachelor's degrees from universities and other tertiary institutions, both public and private, continue to add to the unemployment situation each year to the extent that there is currently an Unemployed Graduates Association in Ghana (Ampadu-Ameyaw, Jumpah, Owusu-Arthur, Boadu & Fatunbi 2020:8; Ministry of Employment and Labour Relations [MoELR] 2014:10). Even though there is no disaggregated data relating to the number of unemployed accounting graduates in Ghana, existing statistics revealed that more than 71 000 of graduates from the various tertiary institutions in Ghana enter the employment market every year (Adjetei 2015:1). Nevertheless, it was found that about 50% of such graduates were unable to secure sustainable employment after two years after completing their national service and 20% of them could not find employment after three years (Allotey 2015:1). More recent statistics from the Institute of Statistics, Social and Economic Research of the University of Ghana (Institute for Fiscal Studies [IFS] 2019:10) has shown that merely 10% of graduates secure employment one year after completing national service and it may take some of them up to 10 years to secure employment. These statistics clearly depict a deteriorating state of graduate employment in Ghana and this could negatively affect the socio-economic development of the country unless urgent strategies and policies are adopted to address the situation.

The employment challenges of graduates mostly result from graduates' skills mismatch largely due to the nature of training being provided by educational institutions and the competences required in the workplace (Ampadu-Ameyaw, Jumpah, Owusu-Arthur, Boadu & Fatunbi 2020:8; Baah-Boateng 2015:4). A similar reason was given by several studies worldwide in relation to the unemployment situation of accounting graduates (see Cory & Pruske 2012:216; Heang et al. 2019:1074; Naidoo, Jackling, Oliver & Prokofieva 2011:27; Osmani et al. 2017:324; Shamsuddin et al. 2015:22). Employers in Ghana consider accounting graduates as not having employment-relevant skills and consequently they are seen as incompetent in performing satisfactorily the much-needed tasks in the workplace (Gondwe & Walenkamp 2011:41; IFC 2019:44; Macaulay 2014:9). The Ghana national employment policy (see Ministry of Employment and Labour Relations 2014:9) arrived at a similar conclusion, noting with great concern that the Ghanaian tertiary educational system lacks innovative characteristics that would make it possible for graduates to obtain the competences needed by employers or the relevant knowledge and skills needed to be self-employed. What is more, McCowan et al. (2016:90) indicate that graduates' unemployment in Ghana is not caused by unavailability of employment opportunities, but rather by a lack of relevant employability skills of the graduates. It therefore seems that neither graduates nor employers are satisfied with the employability skills training being offered by universities in Ghana.

Attempts have been made by successive governments through several initiatives to provide employment for unemployed graduates in Ghana. Notable among these initiatives are the National Youth Employment Programme (NYEP) introduced in 2006, which was transformed into the Ghana Youth Employment and Entrepreneurial Development Agency (GYEEDA) in 2012. Subsequently, the GYEEDA was also restructured into the Youth Enterprise Agency (YEA) under the Youth Employment Act (No. 887 of 2015) (see Acheampong 2019:12). The main aim of these programmes was to provide skills training and valuable work experiences to unemployed graduates in order to enhance their employability (Avura & Ulzen-Appiah 2016:6). However, these programmes only provided temporary employment to the graduates. As a result, they were unable to reduce the rate of graduates' unemployment in the country (Acheampong 2019:14; Gyampo 2012:24). In 2018, the government established the Nation Builders Corps (NABCO) to address graduates' unemployment problem. Even

though the full impact of the NABCO programme is yet to be known, it has been criticised extensively in terms of its sustainability and capacity to provide a lasting solution to graduates' unemployment in view of past initiatives (Acheampong 2019:14; Kwofie & Dadzie 2020:14).

Undoubtedly, a very serious gap exists between the demand and supply of accounting skills in Ghana. In order to deal with this disturbing issue of graduate unemployment, many stakeholders in Ghana, including state agencies and private sector organisations, emphasised the need for a comprehensive review of certain aspects in the current curriculum of universities and other tertiary institutions (Bawakyillenuo et al. 2013:43; Bingab et al. 2016:12). Through this, it is deemed that these institutions will be able to provide graduate students with employment-relevant skills to meet the demands of businesses and the economy as a whole (Baah-Boateng 2015:13; Bawakyillenuo et al. 2013:45; Owusu-Ansah & Poku 2012:218). The current study is in response to the call by Bawakyillenuo et al. (2013:43) and Bingab et al. (2016:12) for a comprehensive review of the accounting curriculum of public universities in Ghana. The results of the study will contribute by reflecting the views of QH agents involved in the study to consider the skills requirements of accounting graduates.

2.6 GRADUATENESS AND EMPLOYABILITY

'Graduateness' and 'employability' are complex concepts that continue to feature in university-level education discourse, policy and practice in both developed and developing countries (McQuaid & Lindsay 2005:197; Mtebula 2014:26). 'Graduateness' is used to describe the general learning outcomes of university education (Steur et al. 2016:7). It includes the complex set of skills, subject-specific knowledge and attributes, which equip graduates to perform effectively and efficiently in the workplace (Glover et al. 2002:303). 'Graduateness' refers to the quality that graduates across all degree programmes need to prepare them for the workplace (Walsh & Kotzee 2010:38). Glover et al. (2002:303) emphasise that graduates need to maintain some amount of continuous learning since graduateness alone might not guarantee a continued individual and institutional achievement in an extremely competitive global work environment.

'Graduateness' and 'employability' are closely related (Chetty 2012:8; Steur et al. 2012:863). The term 'employability' can be used in different contexts and with different meanings to both job seekers and those who are already working (McQuaid & Lindsay 2005:199; Misni, Hasnaa, Mahmood & Jamil 2020:910). Whereas employers see employability as the skills and competencies wanted in newly recruited staff, universities consider employability as the skills and qualities required of their graduates to secure employment and be able to handle workplace challenges (Peeters et al. 2019:82).

'Employability' refers to the development of a skill set whereby any individual who has the capacity to work is encouraged to develop the required knowledge, skills, technology and flexibility to enable them to secure and stay in employment all through their working lives (Tran 2016:61). Curtis and McKenzie (2002:6) argue that, due to changes in the labour market conditions and government policies, employability skills should keep an individual in demand by current or future employers. In response to the argument by Curtis and McKenzie (2002:6), Forrier and Sels (2003:107) suggest a wider working definition of employability to mean the ability to progress in the job market to realise one's potential through lasting employment. For the individual, employability is dependent on the knowledge, skills and attitudes he or she has, the manner he or she utilises and demonstrates these qualities to employers, and the context in which such individual searches for work (McQuaid & Lindsay 2005:202). Yorke (2005:7) concludes that the employability of a graduate refers to the ability of such graduate to secure employment, perform effectively in the workplace and build a career.

Employability is based mainly on a unique mix of skills even though the abilities and qualities of the individual cannot be overlooked (Clarke 2018:12; Tomlinson 2012:428; Tran 2016:61). Employability skills are considered vital for several job positions and therefore have become necessary for the employment success of an individual at every level within an organisation (Abas & Imam 2016:125). In this regard, the level of competency of the graduate needs to be equivalent to the level of competency required by the employer before he or she can secure employment (Ismail, Yussof & Sieng 2011:191).

2.6.1 Graduateness and employability of accounting graduates

The development of the economy of every nation requires accounting graduates who have the ability to contribute to the success of the organisations where they are employed by accepting complexities, diverse forms of organisational citizenship and changes to the business environment (Shuttleworth 2012:245). However, reports that employers are struggling to employ and retain new accounting graduates with the relevant skills and attributes (see Alshare & Sewailem 2018:20; IFC 2019:44; Shamsuddin et al. 2015:22) implies that it is no longer adequate for accounting graduates to acquire technical knowledge. Undoubtedly, it is essential for them to acquire twenty-first century skills and attributes that will enhance their employment prospects (Ackerman 2019:2; Alshare & Sewailem 2018:19; Gammie, Gammie & Cargill 2002:63; McGunagle & Zizka 2020:2).

An accounting graduate without the requisite skills and attributes that are linked to a particular position will not be qualified to earn a good salary and he or she will also not be in high demand in the labour market (McGunagle & Zizka 2020:15; Puckett et al. 2020:1). This requires serious attention to be focused on graduateness of accounting students to prepare them adequately for a successful transition to employment and handling their continued employability in an unstable working environment (Chetty 2012:3; Coetzee 2014:887; Steur, Jansen & Hofman 2012:863).

Consequently, university education is crucial for equipping accounting graduates with the required knowledge, skills and attributes through a well-designed curriculum to enhance their employability in the business world (Bhola & Dhanawade 2013:52; Clarke 2018:11; Heang et al. 2019:1074; McCowan 2015:281). Gammie et al. (2002:66) however maintain that employers also have a duty to integrate work-related skills into their training programmes. Further studies suggest collaboration between industries, government and other stakeholders on the one hand and universities on the other to equip graduates effectively with employability skills (Aloysius 2019:24; König & Ribarić 2019:88). Such collaboration may help considerably to minimise or resolve the continuous criticism of universities of their inability to train graduates adequately in order to face the challenges in the ever-changing world of work. The next section provides details of the knowledge, skills and attributes accounting graduates require to satisfy the demands of employers in the twenty-first century employment market.

2.7 TWENTY-FIRST CENTURY SKILLS REQUIREMENTS OF ACCOUNTANTS

As the employability challenges of accounting graduates continue to increase, a number of professional accounting bodies and scholars in the field of accounting have recommended key skills and attributes required to promote graduate employability in the twenty-first century (Klibi & Oussii 2013:119; Rufino 2015:17). To start with, the IFAC International Education Standard 3 (International Accounting Education Standards Board [IAESB] 2017:46–49) prescribes the core skills to be acquired by persons who want to become professional accountants irrespective of their initial selected career path. These skills, which are categorised into five main groups, are presented in Table 2.1 below. Failure to equip accounting students with these skills may add to the continuous blame of the accounting educational system for not being able to satisfy the skills needs of employers.

Table 2.1: Professional skills for accountants

Professional skills	Descriptions
Intellectual skills	Knowledge; understanding; application; analysis; synthesis and evaluation; which enable the accountant to solve problems make decisions and exercise good judgment in complex organisational situations.
Technical and functional skills	Numeracy and IT proficiency; decision modelling and risk analysis; measurement; reporting; and compliance with legislative and regulatory requirements.
Personal skills	Self-management; initiative, influence and self-learning; ability to select and assign priorities within restricted resources, and to organise work to meet tight deadlines; ability to anticipate and adapt to change; considering the implications of professional values ethics and attitudes in decision-making; and professional scepticism.
Interpersonal and communication skills	Work with others in a consultative process to withstand and resolve conflict; work in teams; interact with culturally and intellectually diverse people; negotiate acceptable solutions and agreements in professional situations; work effectively in a cross-cultural setting; present, discuss, report and defend views effectively through formal, informal, written and spoken communication; and listen and read effectively, including a sensitivity to cultural and language differences.
Organisational and business management skills	Strategic planning, project management, management of people and resources, and decision-making; ability to organise and delegate tasks, to motivate and to develop people; leadership; and professional judgment and discernment.

Source: Adapted from IAESB (2017:46–49).

According to the 2018 Skills Gap Study by Deloitte and the Manufacturing Institute (2018:8), there are five main skills in the 4IR, which accounting students need in order to succeed, namely:

- technology and computer skills;

- digital literacy and competency;
- working knowledge of technology-enabled tools and techniques;
- robot and automation programming; and
- critical thinking.

The Services Corporate Staffing (2017:1) also published five key skills that graduates need to master in order to succeed in an accounting work environment: analytical skills, ICT competencies, innovation skills, organisational skills, and communication skills. Furthermore, a study by the National Association of Colleges and Employers in the United States focused on seven key competencies that all graduates require to survive in the 4IR, namely critical thinking, communication, teamwork, ICT, leadership, professional ethics, and career management (Williams 2019:2).

Certain ICT and critical thinking skills (HOT skills), which relate to the main research question of this study featured continuously among the sets of skills stated in the above paragraph. Taking into account the unprecedented pace of technological development, employers expect accounting graduates not only to learn and generate accounting information, but also to acquire several skills, such as 4IR ICT skills and HOT skills (Chalkiadaki 2018:10; Dunbar, Laing & Wynder 2016:70; Zureigat 2015:234). Tanaka and Sithole (2015b:176) note that employers are looking for multi-disciplinary graduates who can utilise technology to innovate, create and provide specific services. Other studies also found that, in order to survive in the 4IR work environment, ICT education for accounting professionals needs to be accompanied by HOT skills (Hayes et al. 2018:179; Naidoo et al. 2011:25; Suarta, Suwintana, Sudhana & Hariyanti 2017:341; Yanto et al. 2018:13).

Sub-sections 2.10 and 2.13 discuss the relevant ICT and HOT skills that accounting graduates need to master in order to overcome some of the challenges in employment opportunities.

2.8 INFORMATION COMMUNICATION AND TECHNOLOGY (ICT)

Information communication and technology was fundamental to this study and, as a result, it is imperative to explain the way it was understood and applied in the current study. The abbreviation 'ICT' stands for 'information and communication technology'

and is widely used alternatively with 'information technology' (IT). IT refers to the computing and telecommunication hardware and software technologies of an organisation, which provide an automatic means of information procession and communication (Heeks & Molla 2004:1). 'ICT' is an expanded term, and refers to all technological equipment required for converting, processing, saving and transferring different types of digital information. ICT comprises data communication, voice telephony, computer and similar fields of technology (Niebel et al. 2013:1). Solaipriya and Suresh (2018:107) define ICT as a generic term referring to communication devices, such as television, radio, mobile phones, computer hardware and software, satellite systems as well as the numerous applications and services connected with these, such as video-conferencing and online distance education. ICTs are often mentioned in a specific context, such as ICT in health, libraries or education. Accordingly, the abbreviation 'ICT' applies to any computer-based technology, whether hardware, software or a network that could be used for collecting, processing, storing, retrieving and sending or receiving accounting information.

Riley (2019:1) classifies ICTs used in business into two main types: traditional computer-related technologies and digital communication technologies. Traditional computer-related technologies include technologies such as:

- word processing, e.g. Microsoft Word for writing reports, letters, etc.;
- spreadsheets, e.g. Microsoft Excel for calculations, forecasting, analysing financials, etc.;
- database software, e.g. Microsoft SQL Server, Oracle or Access to manage data in several forms;
- presentation software, e.g. Microsoft PowerPoint for making presentations;
- desktop publishing, e.g. Quark Express or Adobe InDesign or Microsoft Publishers for producing magazines, newsletters and other documents;
- graphics software, e.g. Adobe Photoshop and Illustrator for creating and editing images, such as logos, pictures or drawing for use in websites and other publications; and
- accounting package, e.g. Oracle or Sage for managing the accounts of an organisation.

Riley (2019:1) explains digital communication technologies to include such technologies as:

- internal networks, often termed 'local area network' (LAN). LAN implies connecting several items of hardware in an office to share hardware devices, such as printers, data and software applications; and
- external networks, often termed 'wide area network' (WAN). Accountants need to be part of WAN before they can communicate to other persons outside their internal network.

Having described the various ICTs used in business, section 2.9 will explain the importance of ICT skills to the accountant leading to the review of ICT skills requirements of accountants.

2.9 IMPORTANCE OF ICT SKILLS FOR THE ACCOUNTANT

Harris (2014:69) argues that ICT is the biggest factor shaping the future of the accounting profession. Consequently, using ICT effectively and efficiently has become obligatory for accountants (Mashayekhi & Mohammadi 2014:19). The development of computers and the resultant computer technology has not only transformed the way businesses operate but also affects how accountants work and the nature of the services they provide (Pan & Seow 2016:169). In fact, ICT extends the role of accountants and how they provide services to go beyond the traditional pen, ledger and desk calculator methods of recording, summarising and reporting of accounting transactions (Amirul, Mail, Abu Bakar & Ripain 2017:1; Zenuni, Begolli & Ujkani 2016:7).

The use of ICT does not only improve the accuracy and efficiency of accounting information in general, but also reduces the time needed to present the information for decision-making (Amron, Ibrahim, Bakar & Chuprat 2019:7; Ghasemi, Shafeiepour, Aslani & Barvayeh 2011:113). ICT will make it easier for accounting graduates to gather, transform and analyse data into meaningful information for decision-making. This way accounting professionals will become and remain indispensable for the success of a business (Gibbs et al. 2017: 381; Zybery & Rova 2014:46). Accounting graduates stand a good chance of securing employment if they possess relevant ICT skills and competences that are fundamental for providing competent professional

accounting services (Ogundana et al. 2015:125). Therefore, accounting graduates will have considerable advantages in an increasing competitive workplace if they are able to use ICT efficiently and effectively (Amirul et al. 2017:5).

2.10 ICT SKILLS REQUIREMENTS OF ACCOUNTANTS

Various researchers in the area of accounting education (see Cory & Pruske 2012; Elsaadani 2015; Ogundana et al. 2015; Tanaka & Sithole 2015a) recognise the importance of ICT in business, and recommend a broad spectrum of ICT skills that accountants must possess to remain relevant in the competitive work environment. These researchers therefore expect accounting education to equip graduates adequately with such skills. IFAC, in their International Education Practice Statement 2.1, provides a thorough list of ICT skills:

- general knowledge of IT;
- IT control knowledge;
- IT control competences;
- IT user competences; and
- one of (or a mixture of) the competences of the roles of manager, evaluator or designer of information systems (IAESB 2017:123).

These ICT topics and their subject areas of coverage are summarised in Table 2.2.

Table 2.2: ICT skills requirements for professional accountants

Main ICT topic	Competence areas
General knowledge of IT	IT strategy; IT architecture; IT as a business process enabler; systems acquisition and development process; management of information technology; communication and IT.
IT control knowledge	Internal control environments; IT objectives; IT risk events; IT risk assessments; IT risk responses; IT control activities; information and communication in relation to IT; and monitoring in relation to IT.
IT control competences	Suitable control criteria for analysing and evaluating controls; the IT internal control environment; selected IT objectives; identified IT events; IT risk assessment; selected IT risk responses; IT control activities; information and communication in relation to IT; the monitoring process and actions taken in relation to IT; the application of appropriate IT systems and tools to business or accounting problems; understanding of business and accounting systems; and the application of controls to personal systems.
IT user competences	IT systems and tools to solve business and accounting problems; business and accounting systems; and personal IT systems

Main ICT topic	Competence areas
Role of manager of information systems	Managing the IT strategy of an entity; managing an IT organisation; managing the effectiveness and efficiency of IT operations; maintaining financial control over IT; managing IT controls; managing systems acquisition, development and implementation; and managing systems change and related problem management.
Role of evaluator of information systems	Planning systems evaluation; evaluating systems; and communicating results of evaluations and following-up.
Role of designer of information systems	Analysing and evaluating the role of information in the business processes and organisation of an entity; applying project management methods; applying systems investigation and project initiation methods; applying and determining user requirements and initial design methods; applying detailed systems design and development methods; applying systems implementation methods; and applying systems maintenance and change management methods.
IT project management competences	The role of information in the business processes and organisation of the entity; identification of business and user needs relating to IT; investigations and feasibility studies; project management methods and approaches; management of project budget(s), timeline(s) and personnel; systems acquisition, development and implementation; systems change, problem management and risk management; installation, deployment and testing of IT systems; and evaluation of the efficiency and effectiveness of IT systems and project outcomes.

Source: Adapted from IAESB (2017:128–135).

The IAESB (2017:135) expects that accounting education providers will integrate the ICT competence areas listed in Table 2.3 across the curriculum or offer them as a separate subject. Similarly, the International Accounting Accreditation Standard A7 of the Association to Advance Collegiate Schools of Business International (AACSB) requires accounting programmes to integrate ICT skills and knowledge in the accounting and business curriculum, including knowledge and skills concerning the creation of data, sharing of data, analysis of data, data mining, storage and reporting of data in all organisations (AACSB 2014:5)

The Florida Institute of Technology (2019:2) postulates that, if the role of technology in the accounting profession is growing, then the specific skills employers are likely to seek in accounting graduates in order to be more competitive in the market place are:

- advanced Excel skills: Excel could enhance the skills of accountants to solve complex problems, analyse costs and convey information to stakeholders;
- knowledge of business intelligence software: software such as Cognos and Profit Base could help increase transparency and cut costs for better forecasting;

- data analytics expertise: advanced modelling techniques could add value by allowing for the handling of large amounts of data for competitive insights;
- understanding of enterprise resource planning systems: companies could lower operating costs, reduce cycle times, and gain a competitive edge with enterprise resource planning (ERP) expertise; and
- experience with computing: transitioning businesses to cloud computing could increase flexibility and efficiency.

In addition to the ICT skills requirements for professional bodies, several empirical studies have been conducted in both developed and developing countries to determine the ICT skills that accounting graduates need for optimal performance at the workplace (see Ragland & Ramachandran 2014:127; Tanaka & Sithole 2015a:51). In the developed world, Ragland and Ramachandran (2014:127) examined Excel functional skills considered most relevant in the United States for accounting graduates before starting a public accounting position. The findings of their study suggested that participating accounting graduates underestimated the essence of utilising Excel. The study also found that new employees' understanding of how specific Excel functions are used was statistically different from how some Excel functions are actually used.

Cory and Pruske (2012:216) carried out an exploratory study to establish the opinion of practicing public and private accountants in Texas in terms of the required accounting topics covered in higher education accounting programmes. The study found that, even though it was difficult to offer all accounting-related topics, those on offer were enough to satisfy both private and public sectors of the accounting profession. The study also identified spreadsheets software, word processing, Windows and database software as important ICT skills to be integrated into the accounting curriculum.

With reference to developing countries, Tanaka and Sithole (2015a:51) studied the knowledge and skills that employers in Swaziland required and how satisfied employers were with the skills and competencies exhibited by newly recruited accounting graduates. A total of 35 employers from manufacturing, public service and private sectors including non-governmental organisations were involved in the study. It was found that accounting graduates need to acquire suitable technological skills in accounting software, spreadsheets, word processing, communication packages and

electronic commerce before they can remain relevant in the ever-changing business environment. The results of the study by Tanaka and Sithole (2015a:51) are not remarkably different from the study by Awayiga et al. (2010:150) who identified spreadsheet, database, presentation software, technology management and budgeting, word-processing packages, electronic commerce and the World Wide Web (WWW) as the ICT knowledge and skills required of accounting graduates at the time of entering the accounting profession in Ghana and other developing countries.

In another study, Elsaadani (2015:8) evaluated the sufficiency of ICT skills of recently qualified Egyptian accounting graduates by soliciting the opinions of senior accounting professionals. The study revealed that any recently qualified graduate should have an advanced knowledge in using the internet, word processing and spreadsheet software, e-mail, commercial accounting and database management software.

Amirul et al. (2017:5) conducted a study involving senior-level managers of public accounting firms in Malaysia, and found that knowledge and skills in accounting software, accounting systems, database concepts and analysis, project management and business processes are essential for accounting graduates and therefore need to be covered in the accounting degree programme. In a similar context, a recent study by the Malaysian Institute of Accountants (MIA) (2019:31) found that big data and analytics-based financial services, cyber security, cloud computing, payment systems, mobile money platforms and social media are among the emerging technologies of which professional accountants need to keep abreast.

In summary, based on the literature reviewed on the ICT topic coverage from previous studies to date, word processing, spreadsheets, databases, accounting software packages and internet usage as well as advanced ICT skills such as cloud computing, big data and data analytics are the main aspects of ICT skills accounting graduates need for sustainable employment during the 4IR. However, most of these studies failed to provide a detailed discussion of these ICT skills and did not specifically mention RPA. Each of these ICT skills as well as RPA and the importance of these skills to the accounting profession – both currently and in the future – are explained in the sections below.

2.10.1 Word processing

In recent times, accountants increasingly started using computers in their day-to-day work. However, some of them are deficient in the use of word processing, which is a fundamental computer literacy skill essential for the effective and efficient performance of their tasks (Elsaadani 2015:7; Harris 2014:62). Accountants are frequently required to prepare reports for management or other parties. Sound knowledge of word processing software will permit the accountant to create text documents, edit texts and objects, format the document to increase readability and appearance, print copies of the document, and save the document for future reference (Tanaka & Sithole 2015b:174). The different types of word processing available that accountants could use include Microsoft Word, WordPerfect Office and Star Office Writer.

2.10.2 Spreadsheets

Spreadsheets are very useful for accountants to analyse business performance. The most popular spreadsheet applications in use are Lotus 1-2-3, Microsoft Excel, StatView, Quattro Pro, VisiCalc GS-Calc, Easy Calc and Super-Calc (Chaamwe & Shumba 2016:435). Coleman and Blankenship (2017:3) contend that spreadsheets have become an indispensable part of most businesses worldwide and will continue to be an industry and professional standard that accountants should recognise. In their study, Lee, Heng, Sam and Xiog (2018:41) identified spreadsheet deficiency in newly employed accounting graduates, and proposed that the accounting curriculum should emphasise the teaching of spreadsheets to help graduates acquire spreadsheet proficiency required to perform accounting tasks. Frownfelter-Lohrke (2017:68) also recommends that undergraduates should understand spreadsheet analysis and be able to create good-quality spreadsheets for financial reporting and major decision-making.

2.10.3 Databases

Database software is defined as computer programs designed to store and manage large amounts of data to make it accessible (Peterson 2022:1). A comprehensive database software program is sometimes called a database management system (see Olowu 2011:451). Olsen (2000:53) identified Microsoft Access, FileMaker Pro, Oracle, SQL Server, and FoxPro as examples of advanced database applications that can be

used to accomplish accounting and other business tasks. Many studies reported accounting graduates' insufficient competencies in database and spreadsheet applications and the negative consequences for the future of the accounting profession (see Amarathunga & Pathiratine 2015:106; Hadzrami, Rasit, Rosli & Ibrahim 2012:37). Database software assists accountants to extract the information needed to prepare financial reports. Auditors also need to know how to access their clients' databases so that they can gather sufficient appropriate evidence to support their opinion on their clients' financial statements (Derclaye 2005:7).

2.10.4 Accounting software

Accounting software refers to computer programs used by accountants for recording and reporting financial transactions of a firm (Sriwidharmanely & Syafrudin 2012:99). Accounting software has the necessary accounting functions, namely input, processing and output, and it automates the traditional paper ledgers and other books of accounts thereby reducing the costs of accounting and allowing better financial decision-making through timely, accurate and reliable reporting (Ghasemi et al. 2011:113). Generally, accounting software is classified based on the types of operations the business handles. The most popular accounting software programs are FreshBooks, QuickBooks and Sage Pastel Accounting, Tally. ERP 9, SAP ERP Financial Management software and Xero (Williams 2020:1). Among this software, the most popular ones used by organisations in Ghana are QuickBooks, Tally ERP 9, Sage Pastel Accounting and Ghana Integrated Financial Management Information System (GIFMIS).

There have been reports by employers that accounting graduates are unable to perform because they lack practical application skills and competence in the use of accounting packages, and this costs employers considerable amounts of money and time through orientation and training (Machera & Machera 2017:384). Consequently, up-and-coming accountants are encouraged to familiarise themselves with accounting software tools to assist them perform accounting functions efficiently and effectively in this era of advanced technology (Ghasemi et al. 2011:116; Machera & Machera 2017:384; Tanaka & Sithole 2015a:50).

2.10.5 Internet usage

The internet is a huge network consisting of global computer networks. It is an essential element of modern information and communication systems, affecting various aspects of the work done by accountants (Sorin-Ciprian 2017:23). The major facilities available on the internet include e-mail, list servers, USNet or newsgroups, File Transfer Protocol (FTP), Internet Relay Chat (IRC), the Gopher facility, and the WWW. These facilities will enable the accountants to access rare remote devices, information sources and inter- or intra-organisational communications (Youssef 2012:1). By using the internet, accountants can access bank accounts online, monitor cash flow, download cleared deposits and withdrawals from banking software, import these directly into accounting software for reconciliation, and submit tax returns online (Sorin-Ciprian 2017:37). Even though the internet enables unprecedented sharing of data and tools that could complement and enhance accounting and auditing tasks, Moll and Yigitbasioglu (2019:15) warn that the accounting profession must be vigilant in developing the required skills and policies to manage the implementation and use of these technologies in an organisation successfully.

2.10.6 Cloud computing

Cloud computing has become an inseparable part of the accounting profession, as most applications that accountants and their clients need to conduct business are available on the cloud (Khanom 2017:31). Cloud computing is the practice of using a network of remote servers hosted on the internet to store, manage and process data, rather than a local server or a personal computer (Dimitriu & Matei 2014:842). The basic idea about cloud computing is that, where the service is located, and other details relating to the hardware or operating system on which it runs, are immaterial to the user (Ranger 2018:1). By using a cloud, businesses do not need to purchase all the computing resources such as networks, servers, storage, applications and services which they might use; they only access them when needed (Khanom 2017:33). The National Institute of Standards and Technology (NIST) (2011:3) in the United States identified four types of cloud deployment models: private cloud, public cloud, community cloud, and hybrid cloud:

- the **private** cloud infrastructure is operated exclusively for an organisation;
- the **public** cloud infrastructure is available to the general public;

- the **community** cloud infrastructure is shared by a number of organisations; and
- the **hybrid** cloud infrastructure is a combination of two or more clouds that remain different entities but are bound together by standardised technology that enables portability of data and application (Mell & Grance 2009:12; Narayana, Kumar & Jayashree 2017:1477).

With cloud computing, accountants are able to provide their employers or clients with easy access to financial information and in a form that they can understand and use for the purpose of making correct financial decisions (Rao, Jyotsna & Sivani 2017:53). Cloud computing may also assist internal and external auditors to access and analyse data and detect anomalies on time even though the maintenance of an audit trail in the cloud environment could be more challenging than conventional internal systems (Weir, Aßmuth, Whittington & Duncan 2017:3). However, studies reported a lack of cloud computing knowledge among the accounting staff of many organisations (see Amron et al. 2019:6; Yoon 2020:2). As a result, the introduction of cloud computing in the accounting curriculum will help graduates acquire the essential knowledge and competences in order to provide guidance for their employers on this new business platform.

2.10.7 Big data and data analytics

Big data is concerned with the nature of data, while data analytics relates to the collection of tools developed to enhance the meaning of big data (Salijeni, Samsonova-Taddei & Turley 2019:95). According to the Institute of Management Accountants (IMA) (2013:10), big data refers mainly to the vast amount of data that is continuously collected using tools and technologies such as credit cards, the internet and social media and, increasingly, Wi-Fi sensors and electronic tags. Many scholars define 'big data' in terms of five Vs: volume, velocity, variety, value and veracity (see Arnaboldi, Busco & Cuganesan 2017:2; Fosso Wamba, Akter, Edwards, Chopin & Gnanzou 2015:235; Russom 2011:8; White 2012:212):

- **volume** relates to the amount of data;
- **velocity** indicates the increased rate of generating and processing data;
- **variety** means the desired diversity in the type of data;
- **value** describes the economic importance of the available big data; and
- **veracity** defines quality of data and the level of trust in different sources of data.

Warren, Moffitt and Byrnes (2015:293) and Hasan, Popp and Oláh (2020:13) believe that big data will momentarily change accounting in all aspects of practice and the profession, current or future. Accordingly, accountants will need to develop proficiency in the interpretation and utilisation of data analytics in order to stay relevant in this era of technology.

The application of analytics to big data creates several opportunities for business organisations to obtain a good understanding, predict future results and mechanise tasks of non-routine nature. Big data provides considerable opportunities for accountants to employ different sources of data and new analytics tools to analyse controls and operational processes for the purpose of identifying areas of weakness for improvement (ICAEW 2019:12). Big data will also be helpful to the accountant in the provision and analysis of financial information for decision-making (Bhimani & Willcocks 2014:486). Ultimately, big data presents opportunities for the accounting profession to add value and to assist business organisations to transform their decision-making in various areas (ICAEW 2019:5; MIA 2019:31). However, several studies found that accountants with big data analytics skills are scarce (Al-Htaybat & Alberti-Alhtaybat 2017:870; Arnaboldi et al. 2017:7; Moll & Yigitbasioglu 2019:16; White 2012:211). A study by Dewu and Barghathi (2019:436) established that the accounting curriculum worldwide lacks adequate knowledge to equip students with the skills to handle big data analytics. Dewu and Barghathi (2019:436) therefore recommend an urgent incorporation of big data analytics in the accounting curriculum to provide students with the knowledge and skills of big data analytics required in the workplace.

2.10.8 Robotic process automation (RPA)

RPA is a new technology, which is rapidly transforming business and accounting functions all over the world (Gotthardt et al. 2019:32). In the literature, RPA is described as a software program that imitates the human worker, with the objective of tackling structured work fast and in a cost-effective manner (Asatiani & Penttinen 2016:3). Given the fact that RPA is a new technology, not much academic research has been done in this area (see Cooper, Holderness, Sorensen & Wood 2020:8; Jędrzejka 2019:152). This clearly constitutes a gap in literature with respect to RPA, which this study attempted to explore. The RPA market is expanding rapidly, and it is estimated

that 85% of big organisations would have deployed some form of RPA by 2022 (Moore 2018:1). Areas in accounting where RPA can be applied are bank reconciliations, sales ordering and invoicing, management of fixed assets, inventory and payables or receivables, financial reporting, tax planning, and many others. In auditing, RPA can be applied to repetitive and manual tasks such as internal control testing, detail testing and compilation of audit test results (Moffitt, Rozario & Vasarhelyi 2018:4).

Since RPA can be used to perform various accounting and auditing functions, it is very important for accountants to develop the required skills and competencies to be able to support the implementation of RPA within their organisations (Kokina & Blanchette 2019:16). Given the increasing application of RPA in accounting, incorporating RPA into the accounting curriculum will ensure that students are exposed to this technology and its applications so that they can develop the much-needed skills for the digital economy. According to Ng (2020:1), graduates who developed RPA skills are likely to have a competitive advantage during interviews for internships and permanent employment.

2.11 ACCOUNTING CURRICULUM AND INTEGRATION OF ICT SKILLS

Many academics and practitioners in the field of accounting have already established that ICT is becoming a key component of the tasks performed by accountants in both private and public enterprises in the twenty-first century (Amirul et al. 2017:2; Harris 2014:69; Ku Bahador, Haider & Kedah 2017:5508). Consequently, ICT knowledge and skills are especially important for new-generation accountants across organisations and therefore need to be incorporated into the accounting curriculum and taught with the support of modern teaching methodology (Serdyukov 2017:27).

Notwithstanding the importance of ICT for the accountant, research found that IT technologies are still not integrated satisfactorily into the accounting curriculum of most universities. There is consequently quite a difference between what accounting graduates actually learned and what employers require from them upon hiring (Altarawneh 2016:63; Ku Bahador et al. 2017:5512; Tanaka & Sithole 2015a:50). Zureigat (2015:235), for instance, examined the skills of accounting graduates and skills required by employers in Saudi Arabia. The outcome of the study showed that the employers required accounting graduates to possess ICT skills. Consequently,

Zureigat suggests that accounting education programmes should be restructured to provide accounting graduates with the appropriate ICT knowledge and skills required for the world of work.

Mustafa EL-Dalahmeh (2017:207) considered the ICT skills required of newly trained accounting graduates in the business environment in Jordan. The results indicated that accounting and ICT are closely connected and that most employers require graduates who possess a high level of ICT knowledge. In the same context, Altarawneh (2016:63) found that Jordanian accounting graduates lack the necessary ICT skills that can be demonstrated practically in the workplace. Hence, accounting educators in Jordan were advised to adopt a comprehensive set of modules for providing accounting students with the much-needed ICT competences.

In a different study, Damasiotis, Trivellas, Santouridis, Nikolopoulos and Tsifora (2015:543) examined the ICT competences of accounting graduates in Greece. The results of this study showed that, although the accounting education curriculum has adopted a wide range of ICT modules, the ICT skills and knowledge required from accounting graduates were below the expectation of employers. Therefore, accounting educators should be more innovative in integrating ICT successfully into teaching and learning to prepare graduates for modern accounting roles (Damasiotis et al. 2015:543; Serdyukov 2017:27).

In the same line of research, several studies have been conducted in Africa with regard to the adequacy of ICT skills in accounting education (Elsaadani 2015:3). Research by Stumke (2017:132) found that ICT training offered by South African universities were not sufficient to equip accounting graduates to utilise ICT to their advantage. The findings by Stumke (2017:132) were in line with those of Ibidunni and Ibidunni (2015:124) who studied ICT skills offered to accounting students in Nigeria. The studies mentioned here all found that accounting graduates were not adequately equipped with relevant ICT skills required by the accounting profession in the countries under study.

The results of the above studies were not different from the results of similar studies regarding the integration of ICT into the accounting curriculum of most Ghanaian universities (see Addy & Ofori-Boateng 2015:27; Buabeng-Andoh & Issifa 2015:1287;

Quaye, Felix & Kofi Annan 2015:12). Section 2.12 presents details of initiatives that the government of Ghana have undertaken regarding ICT across the Ghanaian educational sector for the purpose of assisting graduates to overcome employment challenges in the twenty-first century and also to ensure economic growth and development in Ghana.

2.12 ICT INITIATIVES ACROSS THE GHANAIAN EDUCATIONAL SECTOR

ICTs are driving the global development agenda (Nwagwu 2006:167). As a result, several developed and developing countries are examining how to promote their developmental processes by developing, deploying and utilising ICTs across their economies (Buabeng-Andoh & Issifu 2015:1282). Using ICT for educational purposes greatly contributes to knowledge acquisition, offers countries considerable opportunities to improve education systems, enhance formulation of policies, and open several prospects for business (Mikre 2011:6). In view of this, Ghana, like other developing countries, recognised the importance of ICT as an essential tool for full participation in the knowledge-based society, and introduced ICT into the educational curriculum in September 2007, based on the proposals of the ICT Accelerated Development policy document of Ghana (see Frempong 2012:1; Sarfo, Amankwah & Konin 2017:19).

The primary objective of the ICT policy was to make sure that the Ghanaian educational sector offers sufficient opportunities for the people of Ghana to develop suitable ICT skills, irrespective of the educational level (Sarfo et al. 2017:19). The ICT policy document identified the Ghana Education Service (GES) within the Ministry of Education, tertiary institutions as well as foreign and local educational institutions as the major implementation agencies. The introduction of ICTs into the Ghanaian education sector involves the establishment of ICT laboratories, provision of computers, delivery of education and skills training at every stage within the educational system of Ghana (Republic of Ghana 2015:12).

The contents of the ICT courses at the junior and senior high schools are determined by the Curriculum Research and Development Division with the collaboration of the necessary accreditation agencies, such as the universities for the purpose of ensuring acceptability (Republic of Ghana 2015:44). The contents of ICT that are taught at the

junior and senior high schools in Ghana cover simple appreciation and hands-on experience of computer literacy and use of application. For learners who will want to pursue further studies in computer science at university, they offer an elective ICT course in senior high schools (Adu-Gyamfi, Donkoh & Addo 2017:166; Republic of Ghana 2015:23).

Irrespective of these interventions, several challenges remain in terms of ICT studies at every level of the educational structure in Ghana (Addy & Ofori-Boateng 2015:26; Mereku, Yidana, Hordzi, Tete-Mensah, Tete-Mensah & Williams 2009:25). At the senior high school level, there is a lack of computers and accessories, unqualified ICT instructors, insufficient practical exposure after teaching, as well as limited access to the internet. In addition, many ICT graduates from the universities lack the required technical and practical skills to be able to teach ICT effectively at senior high schools (Peprah 2016:21–22).

The tertiary educational sector in Ghana, which was the focus of the current study, is more advanced in terms of ICT development and usage. All major public and private universities in Ghana formulate and implement their ICT policies (Mangesi 2007:5; Sarfo et al. 2017:20). The study of ICT is compulsory for all students and is taught as a core subject by the information technology or computer science department of the universities (Republic of Ghana 2015:20).

Studies however also reported challenges with ICT training at tertiary institutions in Ghana. Low bandwidth, insufficient internet access, finances and insufficient equipment were some of the problems preventing effective ICT education and training (see Addy & Ofori-Boateng 2015:26; Asabere, Togo, Acakpovi, Torby & Ampadu 2017:179; Boafo 2018:93). Several studies (Addy & Ofori-Boateng 2015:26; Kankam-Boadu 2020:1; Yidana 2018:136) showed that facilitators and students in tertiary institutions in Ghana are dissatisfied with the ICT facilities available for teaching and learning. However, the research of Addy and Ofori-Boateng (2015:26) was limited to only one public university and three private universities in Ghana. The findings may therefore not represent the views of all lecturers and students at tertiary educational level in Ghana.

University students only have access to the computer laboratories when it is time for ICT lessons (Asabere et al. 2017:172). In addition, the content of the ICT course is mainly introductory, which provides basic ITC knowledge in word processing, spreadsheet, use of the internet, and a presentation application for all categories of students irrespective of the courses they pursue. Such programmes cover advanced ICT skills, hardware, software and techniques used in the analysis and design processes for computer systems (Amanortsu, Dzandu & Asabere 2013:29; Asabere et al. 2017:180).

A few other studies also found that, although almost all university students have smartphones and laptop computers – and have high competences in using them – some of them use these for personal purposes. Students' competences therefore did not result in extensive use of ICT for educational purposes (Amanortsu et al. 2013:29-31; Quaye et al. 2015:10). It has, therefore, been suggested that government agencies – such as Ministry of Education and the Ministry of Science and Technology and other interested parties – should provide educational institutions at all levels in the country, especially those in the rural areas, with more ICT equipment such as computers and accessories, wide-reaching broadband and internet connectivity to facilitate effective learning (Buabeng-Andoh & Issifu 2015:1287). This will undoubtedly enhance the standard of education, make education more beneficial to every student and eventually address the technology gap in Ghana during the 4IR (Addy & Ofori-Boateng 2015:27; Quaye et al. 2015:12; Republic of Ghana 2015:45).

Judging from the preceding discussions on the integration of ICT in the accounting curriculum of universities worldwide and in Ghana, it is clear that a gap exists between the ICT skills required by employers and the ICT skills accounting graduates in Ghana actually demonstrate. The integration of information technologies in the accounting curriculum means that accounting graduates who have up-to-date relevant ICT skills will be more likely to integrate easily into an organisation and become more productive than those who do not have it (Heales 2005:412). The integration of ICT into accounting education will develop relevant technological capabilities of accounting students to be able to deliver value to their employers and future employers (Mashayekhi & Mohammadi 2014:19; Ogundana et al. 2015:125).

In conclusion, the integration of ICT into the accounting programme will equip the present generation of university accounting students best for their place of work where ICTs, especially computers, the internet and relevant technologies, are increasingly used. Section 2.13 will present details of HOT skills. As stated earlier in this chapter (see section 2.7), accounting graduates in Ghana also need to master HOT skills in order to overcome some of the employment challenges in the twenty-first century.

2.13 HIGHER-ORDER THINKING (HOT) SKILLS

In order to enhance the understanding of HOT skills, the researcher will differentiate between lower-order thinking (LOT) and HOT. LOT is defined as the ability to commit information to memory on a routine basis without applying it to any real-life situation; it simply needs to be recalled and understood to some extent (Tikhonova 2015:3). Kusuma, Rosidin and Suyatna (2017:26) describe both LOT and HOT as processes where the brain moves from basic information to a critical thinking ability. One must however have LOT ability before one can reach HOT.

HOT elevates thinking to a higher level than merely memorising information (Thomas & Thorne 2009:1). It requires the ability to do something with the information, namely the ability to –

- understand the information;
- infer from the information;
- connect them to other information and concepts;
- categorise them;
- manipulate them; and
- apply them to find solutions to problems (Thomas & Thorne 2009:1).

HOT basically means thinking that occurs in the higher-levels of the hierarchy of cognitive processing (Winarti, Cari, Sunarmo & Istiyono 2015:65). It is an umbrella term that encompasses critical thinking, creative thinking and problem solving (Lewis & Smith 1993:136; Miri, David & Uri 2007:355). King, Ludwika and Faranak (2016:32) define HOT skills to include logical, critical, reflective and creative thinking, which are activated when the individual is faced with a problem. King et al. (2016:32) further suggested that critical thinking is an organised process that allows people to assess the evidence, assumptions and logic underpinning the views of others. HOT includes

the ability to think critically, creatively, analytically and systematically, and to make fair and useful judgments (Mrah 2017:239). For Matondang, Hadi and Lubis (2019:121), HOT skills include the ability of a person to manipulate, connect and transform already existing experience and knowledge in an effort to make decisions and resolve issues in complex situations. Successful HOT involves the ability to apply, reorganise and enhance knowledge in the context of the thinking situation (King et al. 2016:11). The most important feature of these definitions is the move towards problem solving and the understanding that there is more than one possible solution to any problem. There are therefore several perspectives to any given problem and solving a problem thus involves a continuous process and dedication to hard work in addition to accepting uncertainties (Mrah 2017:233).

Widana (2017:3) explains HOT skills to include the ability to –

- transfer one concept to another;
- process and implement information;
- seek links from different types of information;
- process information to solve problems; and
- analyse ideas and information critically.

Based on dimensions of knowledge, HOT is not only knowledge in the factual, conceptual or procedural dimension but also knowledge in the meta-cognitive dimension, which describes the learner's ability to connect various ideas, reasoning, problem solving and decision-making (Rahmawati & Prasetyo 2019:257).

In their study, Rahmawati and Prasetyo (2019:257) identified the following characteristics of persons with HOT skills:

- open-mindedness for risk-taking;
- curiosity;
- a keenness for fact discovery, planning and indicating the most suitable method;
- a system thinking process;
- ability to think carefully;
- ability to use evidence to think rationally; and
- habit of frequent self-monitoring.

Prayoonsri, Tatsirin, Suntorapot and Jariya (2015:2640) add that persons with HOT skills are able to “create new knowledge and make appropriate and logical decisions”. Duron, Limbach and Waugh (2006:165) note that HOT skills help accounting graduates in identifying problems, formulating problem statements, gathering relevant information, prescribing solutions, and communicating effectively with other people. With adequate HOT skills, accounting graduates are well able to resolve personal as well as work-related challenges they may face (Pogrow 2005:74).

In the field of accounting – together with the development of highly advanced technology – it is understood that machines can calculate faster and more effectively than accountants (Moffitt et al. 2018:9). However, in thinking critically and creatively, in strategising, and in analysing complex conditions, accountants are better than machines and are best situated to present the information to those who need it (Fernandez & Aman 2018:127; Rkein et al. 2020:189). Therefore, it can be concluded that accountants do not only need to embrace technology, but also HOT skills for the advancement of the accounting profession. A more detailed explanation of HOT skills and how these applied to the current study is presented in section 3.4 using Bloom’s revised taxonomy of educational objectives framework developed by Anderson et al. (2002:215).

2.14 CHAPTER SUMMARY

The literature presents substantial evidence that accounting education should evolve to fulfil business requirements by equipping students with the skills to provide accurate and relevant accounting and financial information for business decision-making. The literature presents substantial evidence that accounting education should evolve to fulfil business requirements by equipping students with the skills to provide accurate and relevant accounting and financial information for business decision-making. Since the arrival of the 4IR, professional accountants are using increasingly sophisticated and advanced technologies to improve their conventional working methods. In order to remain in high demand, accountants must embrace the changes and be well versed in the use of the latest technologies. Consequently, universities should modify existing course contents or introduce new courses to develop the digital skills that employers will require.

After contextualising accounting education in Ghana and the ICT initiatives across the Ghanaian educational sector, the discussion turned to employability challenges of accounting graduates in Ghana, which result mainly from a lack of adequate ICT and HOT skills. This was followed by a comprehensive presentation of the different skills requirements of accountants in the twenty-first century (refer section 2.7). Although various professional accounting bodies and literature propose various employability skills for accountants in the twenty-first century, emphasis was placed on ICT and HOT skills that constituted the focus of this study. Various studies (see Addy & Ofori-Boateng 2015:27; Asabere et al. 2017:180, Peparah 2016:21–22) noted that the mentioned skills are lacking in accounting graduates in Ghana and therefore need to be covered in the accounting degree programmes, and should be taught with the support of modern teaching methodology (refer sections 2.10 and 2.13).

A major gap identified in the literature that needs to be filled is the lack of consensus in research findings globally and in Ghana particularly, on the mismatch of ICT and HOT skills developed by accounting students and ICT and HOT skills requirements of employers. The chapter provided detailed explanations of the suggested skill-sets relevant for the performance of accounting-related work. Again, these set of skills will be presented through a conceptual framework that can serve as a spring board for curriculum experts (refer to Figure 5.3). A gap also exists currently in technology available and limited actual utilisation of ICT in the universities which places students and eventually graduates at a great disadvantage. Technology and globalisation have led to an increasing skills gap between skills available and skills required (Amirul et al. 2017:2; Pincus, Stout, Sorensen, Stocks, & Lawson 2017:6). Chapter 3 will elaborate on HOT skills and will present the theories that formed the basis of this study in order to develop a conceptual framework for the universities.

CHAPTER 3

THEORETICAL FRAMEWORK IN THE CONTEXT OF ICT AND HOT SKILLS

3.1 INTRODUCTION

In the preceding chapter, literature on accounting education (mainly in the Ghanaian context), the employment challenges of accounting graduates, as well as the employability skills of accountants were reviewed. In the current chapter, a review of the literature concerning the theoretical framework in the context of ICT and HOT skills and the rationale for selecting theories for the current study is discussed as background to the development of a conceptual framework for this study.

A theoretical framework constitutes the structure, which supports the theory of a research study. It further depicts the theory that explains the research problem of the topic under study (Imenda 2014:189). Grant and Osanloo (2014:13) arrived at a similar conclusion, noting that the theoretical framework comprises the chosen theory that forms the basis of researchers' thinking with regard to how they understand and plan the topic under consideration, as well as the definitions and concepts from the theory, which are pertinent to the topic. A theory is formulated to clarify, predict and understand a phenomenon better and, in most instances, to challenge and expand present knowledge within the scope of key assumptions (Abend 2008:178). Knowledge of a theory provides an opportunity for researchers to articulate common language and guide research by assisting practitioners to determine how and in which regard their studies compare with other research studies, and promote collaborations across the field (Beck & Stolterman 2016:125).

The theoretical framework underpinning the current study was based on the QH theoretical innovation model (see Carayannis & Campbell 2009:206) and Bloom's revised taxonomy of educational objectives (see Anderson et al. 2002:215). However, the TH innovation model (see Etzkowitz & Leydesdorff 2000:111), which focuses on the overlapping relationship between the spheres of government–university–industry in the knowledge society context is explained first to enhance an understanding of the

QH innovation model. A visual representation of the structure of Chapter 3 is provided in Figure 3.1.

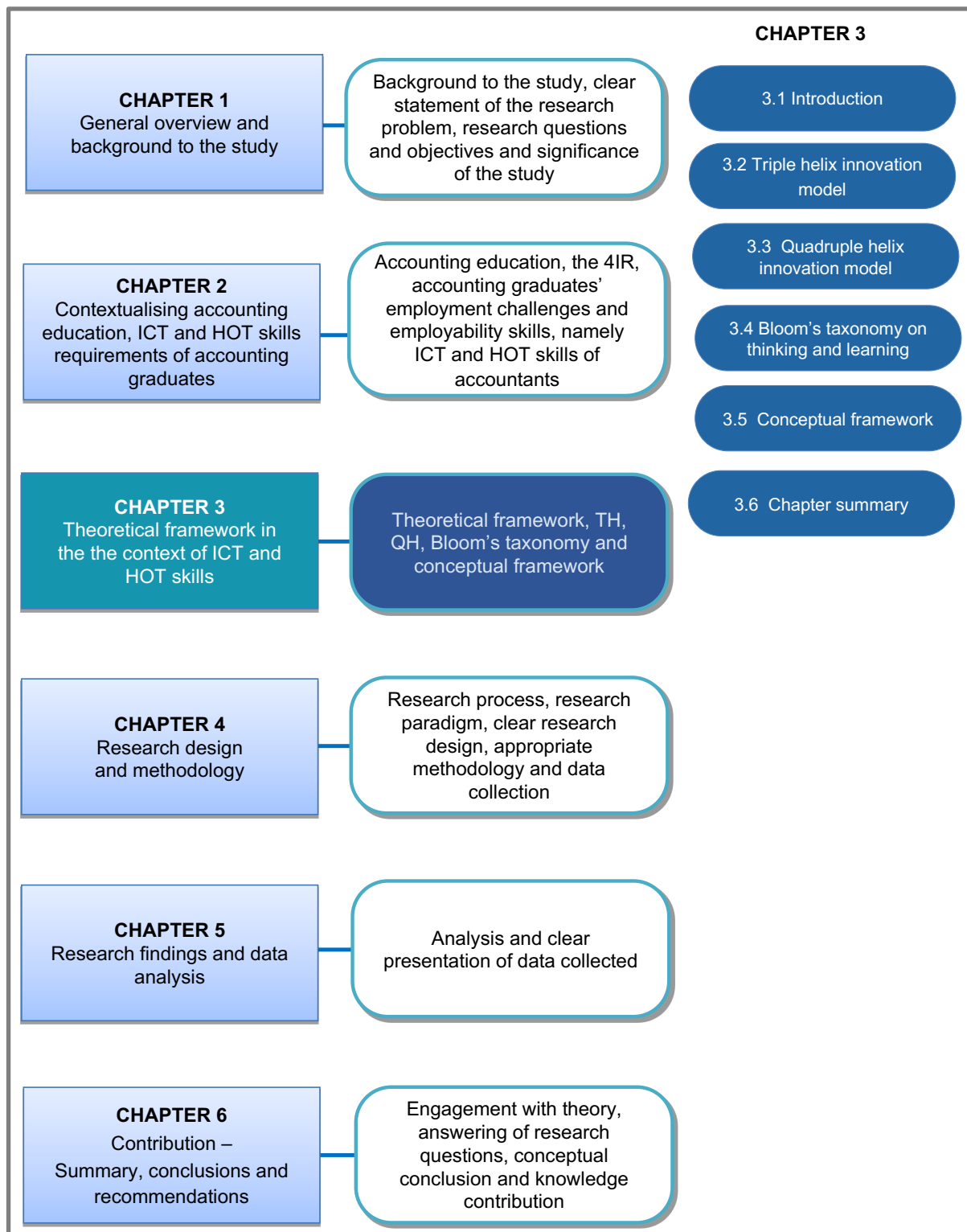


Figure 3.1: Structure of Chapter 3

Source: Author's own compilation

3.2 TRIPLE HELIX (TH) INNOVATION MODEL

The TH innovation model developed by Etzkowitz and Leydesdorff (2000:111) is the basis of the QH theoretical innovation model that constituted the theoretical framework for this study. Consequently, the TH innovation concept is explained to enhance the understanding of the QH innovation model (Zincir 2018:315). The TH model is among the most-mentioned models used to characterise an innovation eco-system (Cai & Lattu 2021:258). The model describes the interaction between the government, academia and industry, and their associated initial roles, which involve academia engaging in teaching and research, industry producing commercial goods and services, and government, for instance formulating policies, providing financial support, and regulating the market (Afonso et al. 2010:5). In addition to fulfilling their traditional functions, each agent also takes the role of the other to close gaps that may emerge when another institution is weak and unable to perform its traditional role. For example, academia may adopt the role of government in initiating development projects. In the governance system, industry may take on a bit of the role of academics, and government may also take on a bit of the roles of both industry and academics (Carayannis & Rakhmatullin 2014:215). Figure 3.2 shows the TH model, depicting the overlapping relationships between government, academia and industry.

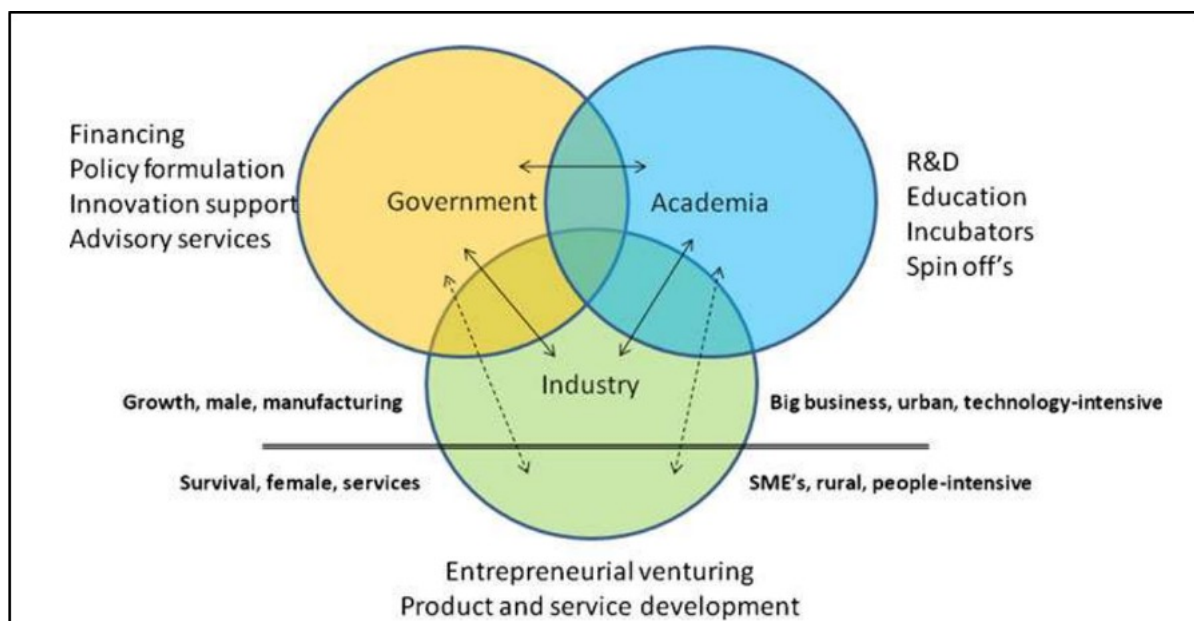


Figure 3.2: Triple helix framework of innovation

Source: Lindberg et al. (2014:101).

The TH innovation model (see Figure 3.2) is seen as the interaction of government, academia and industry, which generates innovation system performance that highlights the key new sources of novelty and dynamics of their interaction. There is consequently innovation, creativity and change in the roles of these three agents (Dzisah & Etzkowitz 2008:102). In the TH innovation model, decision-making is based on collaboration between government and major stakeholders in the economy. Industry engages in endogenous innovation as well as transfer of knowledge (see Carayannis, Grigoroudis, Campbell, Meissner & Stamati 2018:151). Academics play an innovative role in society, as they are active in transnational research projects, entrepreneurial training and community development as well as traditional tasks (Morrar, Hamad & Arman 2018:23). These emerging transformations have dramatically changed the development landscape making the TH model agents the central development partners for the realisation of socio-economic development (Leydesdorff & Ivanova 2016:20).

The TH interaction represents the heart of knowledge-based development with circulation within and among the institutions acting as the avenues that promote ideas and policies from one point to another. This enables the TH model to stimulate knowledge-based strategy and to speed up the rate of socio-economic development by enhancing the free flow of people, ideas and innovations. Understanding these dynamic relationships and interplay is the first step in creating the necessary and sufficient conditions for innovation and sustainable development, especially in universities (Dzisah & Etzkowitz 2008:102).

Etzkowitz and Leydesdorff (2000:110–112) propose different possible models of the TH innovation model, namely **statist**, **laissez-faire** and **balanced interaction** models. With the **statist** model, the government takes control over the universities and industries, especially the public-funded ones, thereby limiting the capacity of the universities to initiate and develop innovative transformations. This is the case in Ghana and other developing countries (Etzkowitz & Leydesdorff 2000:111). With the **laissez-faire model**, there is limited government interference in the economy with industries as the driving force and the universities and government acting as supporting institutions with limited roles in innovation. This is the case in the United States and some Western European countries (Etzkowitz & Leydesdorff 2000:111; Ranga & Etzkowitz 2013:239). The **balanced model** is found where the universities and other

educational institutions play an increasing important role and promote partnership and joint initiatives with government and industry. The balanced model offers the most important insights, because the best environment for innovation is created at the intersections of the sectors (Cavallini et al. 2016:10; Ranga & Etzkowitz 2013:239).

The TH innovation model is founded on the idea that academia plays a more important role in the development of skills in collaboration with government and industry. Academics are able to perform a variety of roles, well beyond their conventional mission of teaching and research, which include knowledge transfer and capacity building within society. In the education of human resources for all sectors of society, the universities, through their alumni, provide the basis for enhanced interaction (Dzisah & Etzkowitz 2008:104). Academics are responsible for preparing graduates to solve societal problems and resolve their own problems confidently, and not to seek employment from others (Dzisah & Etzkowitz 2008:104; Ranga & Etzkowitz 2013:245).

One of the major advantages of the TH innovation model is that each sector is connected to all the others. Afonso et al. (2010:5) indicate that countries that apply the TH innovation model are able to develop a high-level competent workforce, knowledge and innovation-based industries and technology-intensive universities, for example, in Brazil (see Almeida 2005:273), in Sweden (see Jacob 2006:456), and in Malaysia and Algeria (see Saad, Zawdie & Malairaja 2008:435).

3.3 QUADRUPLE HELIX INNOVATION MODEL

The QH innovation model was developed by Carayannis and Campbell (2009:206) as an extension of the TH innovation model (refer section 3.2). In this context, QH means adding to the TH innovation model a 'fourth helix' (Carayannis & Campbell 2009:206). The QH concept can be seen in various academic research, albeit with varying emphases (Arnkil et al. 2010:15; Carayannis & Campbell 2009:206; Hasche et al. 2020:526; Lindberg et al. 2014:100). Claiming that the TH innovation model is limited in breaking new ground for innovation to promote sustainable development in the unfolding twenty-first century, Carayannis and Campbell (2009:206–207) add the "public" as the fourth helix, clearly defined as "media" and "culture-based public" and "civil society".

The knowledge and innovation politics could be considered a reflection of the dynamism of “media-oriented democracy” for strategy development for the purpose of becoming an innovation policy to enhance economic performance (Carayannis & Campbell 2009:218). In addition, the inclusion of civil society in the model was to fill the gaps between the public and innovation. The QH innovation model of Carayannis and Campbell 2009:206) maintains that, under the TH innovation model, the new technologies fail to meet the needs of society completely; hence, restricting their potential influence. Additionally, by including civil society in innovation and production of knowledge may be considered a means of enhancing democracy in the process of innovation as well as improving accessibility to various government and academic recourses for underprivileged groups (Lindberg et al. 2012:40).

The study by Cavallini et al. (2016:5) also reported on the QH approach to accelerate the transfer of innovation results to the regional growth of society. The QH model emphasises the societal responsibility of universities, a third mission in addition to their role of educating and conducting research (Cai & Lattu 2021:261). Carayannis and Campbell (2010:51) regarded the fourth helix as the learned society, i.e. knowledgeable consumers actively participating in innovative systems. Some authors (e.g. Arnkil et al. 2010:15; Pascu & Van Lieshout 2009:83; Yawson 2009:3) named the fourth helix “the user” (including consumers, civil society associations, businesses), which indicates the user-oriented innovation as a significant success factor for all private and public sector organisations. With this approach, user groups are provided with the best opportunity to be successful in business innovations (Arnkil et al. 2010:15). Arnkil et al. (2010:17) maintain that the extent of user participation might be described as comprehensive of the design by users because of the user’s active involvement and participation in the development of their new products and services. In the user-oriented design approach, users may contribute ideas, produce content or develop parts of products. The designer’s role is to be the facilitator (Arnkil et al. (2010:17).

In another study, Betz et al. (2016:588) investigated the fourth helix as “innovation intermediaries” established in universities to provide assistance to enterprises operating on small and medium scales. The QH innovation model could enhance the development of skills, ideas and creativity and therefore could contribute to the innovation process in the university, government establishments, industry and civil

society; hence, the four actors would interact with each other to speed up innovation transfer and sustainable economic growth (Dzisah & Etzkowitz 2008:107; Praswati 2017:702; Setyanti 2017:92).

In summary, there is no agreement in academic literature regarding what the fourth helix consists of; however, the majority of researchers considered the fourth helix in terms of the public, the consumer and the end-user (Carayannis & Campbell 2009:218; Hasche et al. 2020:539; Miller, McAdam & McAdam 2018:9). There is also some consensus on the need for collaboration between the QH agents to enhance innovation, economic growth and development (Lindberg et al. 2014:109; McAdam & Debackere 2018:3). However, collaboration must be based on clearly defined roles of every agent within the QH (Schütz, Heidingsfelder & Schraudner 2019:140).

In this study, the fourth helix of the QH was termed 'graduates', referring to the individuals (consumers and end-users) within society who have completed an accounting major degree at a university and are ready to gain employment and work in an accounting environment. This updated version of the QH innovation model will explain how government, academics, employers and graduates, the four innovation agents, could work together for the development of industry-relevant education, training programmes and opportunities to enhance employability of accounting graduates in Ghana. Collaboration among government, academics, employers and graduates is necessary in skills development and the achievement of the required outcomes of graduate employability (Jackling & De Lange 2009:381; Jackson & Chapman 2012:126). Figure 3:3 below presents the alternative QH framework adopted to guide the current study.

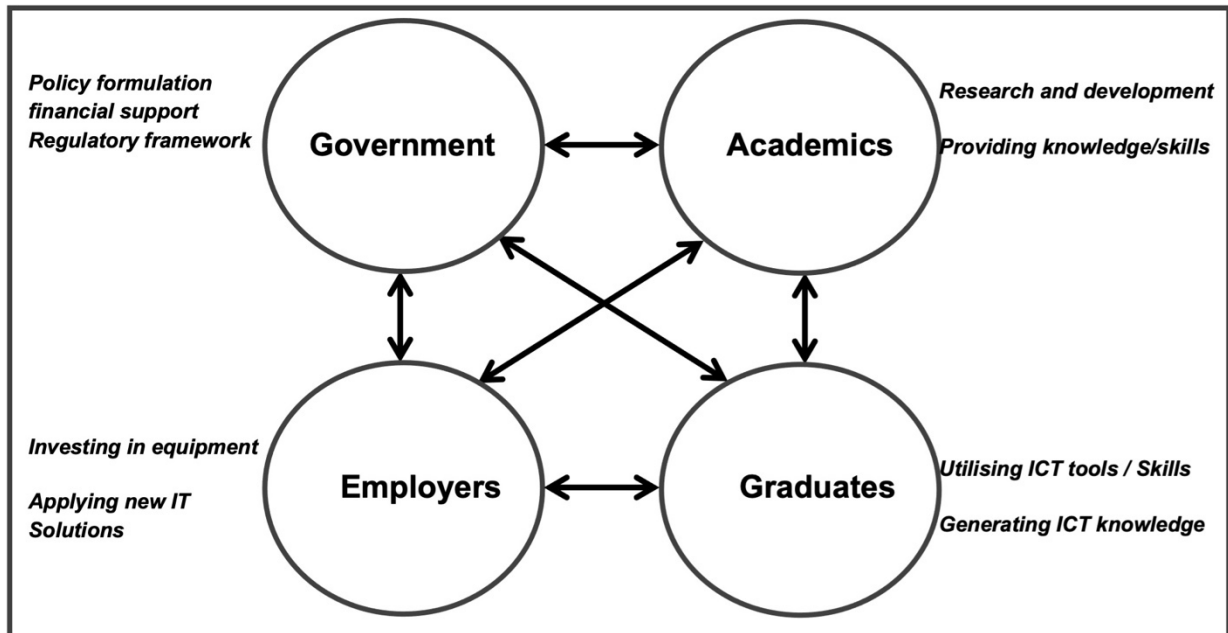


Figure 3.3: Alternative quadruple helix framework of knowledge in an academic setting

Source: Author's own compilation (based on Björk 2014:187; Lindberg et al. 2014:102).

Figure 3.3 was adapted by showing the corroboration between government, academics, employers and accounting graduates, and how the four agents interact to accelerate development and transfer of knowledge, especially in ICT, to enhance employment of accounting graduates. Each agent has a role and identity.

3.3.1 Government

Government comprises the governmental decision-making agencies (national, regional and local) who formulate policies for the effective functioning of businesses, universities and research organisations, provide funds for research and development, facilitate the setting up of new enterprises, and cater for the welfare of citizens (Miron & Gherasim 2018:616). Government also plays a significant role in stimulating higher levels of innovation, improving access to equity capital as well as implementing regulatory frameworks that would enhance the start-up of enterprises (WEF 2015:54–55).

3.3.2 Academics

Academics develop educational programmes oriented towards provision of knowledge, skills and competencies of future graduates. Academics may collaborate with other agents in various ways. Universities can combine research and training abilities in new modes that could translate into formation of new business, particularly in the field of technology (Ranga & Etzkowitz 2013:245). Academics may also apply technology to provide online courses to help both current academics and students who have completed their qualification at university and may be working to obtain relevant technological and work-related HOT skills (Calonge & Shah 2016:82).

3.3.3 Employers

Employers (from both public and private sector organisations) who have the capability to realise the economic importance of recent developments in knowledge, anticipate market demands, take opportunities on the one hand, and the risks in applying new technologies in addition to initiating and operating business projects on the other. Employers can take advantage of developments in knowledge to create new products and services to meet public demand, which would eventually create employment opportunities for graduates (Bilbao, Vankalck, Deiss, Saiz & Cravetto 2016:313). For example, in Romania, companies invested in the fields of artificial intelligence, machine learning, 3D printing, robotics, automation and data processing to create employment opportunities for graduates (Miron & Gherasim 2018:623).

3.3.4 Graduates

Graduates are not only technology users but also technology generators, therefore shifting the role of the university from being a traditional source of workforce to the production and transfer of technology (Hazmilah, Zanariah, Norida, Noraini & Hanipah 2016:672). In the process of integrating ICT and HOT skills and abilities into the university curriculum, both employers and graduates can provide input regarding programme development, not only as part of programme accreditation and review, but also at the level of teaching and assessment of courses (Crebert, Bates, Bell, Patrick & Cragolini 2004:162). Through their alumni associations, universities can actively create innovation platforms and networks to inform and guide newly graduated students in new skills and employment opportunities of the 4IR

(PricewaterhouseCoopers 2018:34–35). The next sub-section presents a discussion of Bloom's taxonomy on thinking and learning, and the way it can be used to explain and develop HOT skills required by accounting graduates in Ghana in order to enhance their employability.

3.4 BLOOM'S TAXONOMY ON THINKING AND LEARNING

Bloom's taxonomy on thinking and learning – named after Benjamin Bloom – can be used to explain HOT skills. This is because the activities of analysing, evaluating and creating are reflected by the top three levels in Bloom's revised taxonomy resulting from the work by Anderson et al. (2002:215). Bloom's taxonomy has been used in educational settings, and serves as guidance to educators when setting learning objectives and assessments for HOT skills (Bali 2014:50). It may therefore be one of the most popular educational theories among educators worldwide. Collins (2014:1) adequately captured the popularity and the aim of Bloom's taxonomy in the following statement:

While Bloom's taxonomy is not the only framework for teaching thinking, it is the most widely used, and subsequent frameworks tend to be closely linked to Bloom's work [...] Bloom's aim was to promote higher forms of thinking in education, such as analysing and evaluating, rather than just teaching students to remember facts (rote learning).

Zapalska et al. (2018:7) adopted Bloom's revised taxonomy to propose a strategy for advancing HOT in an undergraduate management major programme at the United States Coast Guard Academy. Zapalska et al. (2018:9) maintain that any approach to HOT instruction that is suitable for undergraduates can be based on the conceptualisation of HOT that incorporates Bloom's revised taxonomy.

Bloom et al. (1956:18) devised his taxonomy to categorise different levels of thinking. The taxonomy is a progressive hierarchy of thinking skills, indicating that a person's thinking skills progress from a lower level and develop to a higher level (Bloom et al. 1956:18; Reinstein & Lander 2008:82–83). In the original version of the taxonomy, Bloom et al. (1956:18) classified knowledge, comprehension and application as LOT skills, and analysis, synthesis and evaluation as the HOT skills. In Bloom's revised taxonomy, Anderson et al. (2002:215) used action words to describe the thinking skills.

Bloom's revised taxonomy classifies remembering, understanding and applying as LOT skills and analysing, evaluating and creating as HOTS skills. This suggests that students should be able to remember facts and concepts at the most basic level of learning, motivating them to be able, eventually, to create new work at the highest level. In between those two extreme types of thinking skills, students should progressively be able to understand, apply, analyse and evaluate information. Figure 3.4 below depicts the triangle of both the original and revised levels of Bloom's taxonomy.

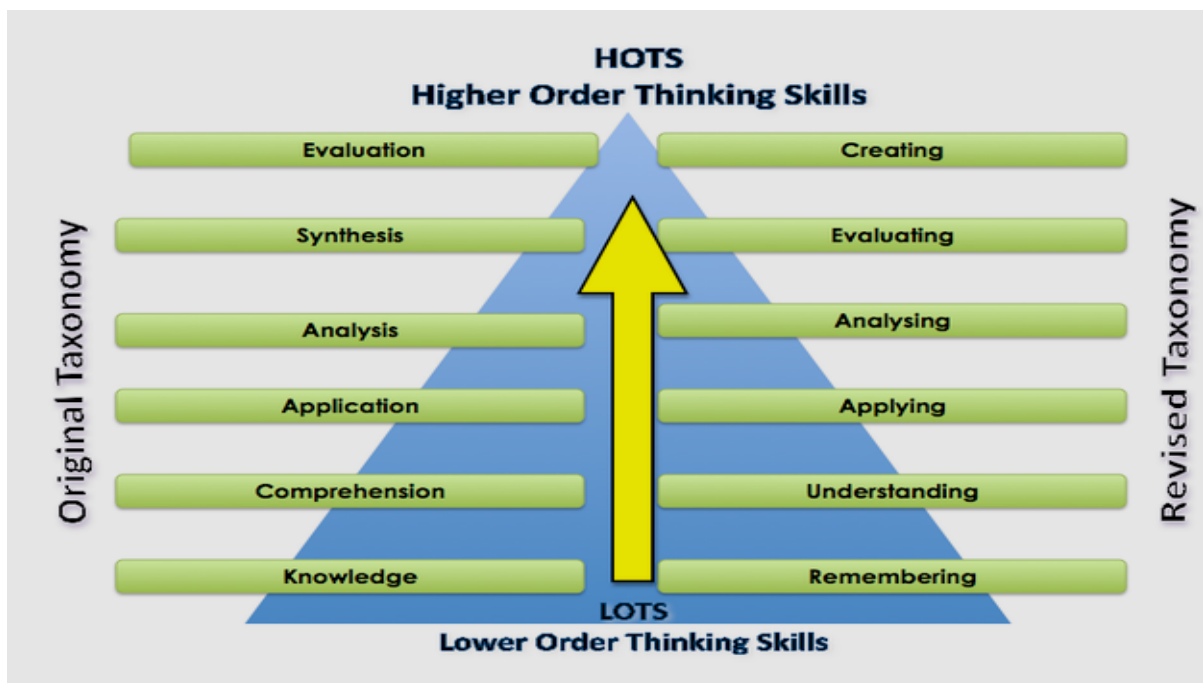


Figure 3.4: Bloom's original and revised taxonomy triangle

Source: The DigiTeacher (2017:1).

In Table 3.1 below, Bloom's revised taxonomy and its cognitive processes are explained. However, the HOTS skills (analysing, evaluating and creating) were the focus of the current study.

Table 3.1: Bloom’s revised taxonomy of educational objectives

<p>Lower-order thinking (LOT) skills:</p> <ul style="list-style-type: none">• Remembering: Retrieving relevant knowledge from long-term memory• Understanding: Constructing meaning from instructional messages, including oral, written and graphic communication• Applying: Using or applying knowledge and understanding in different contexts <p>Higher-order thinking (HOT) skills:</p> <ul style="list-style-type: none">• Analysing: Breaking down information into its constituent parts and determining how the parts relate to one another and to an overall purpose• Evaluating: Making an informed judgement about something as well as comparing, contrasting and prioritising activities• Creating: Generating new ideas through activities such as designing and inventing

Source: Anderson et al. (2002:215).

The 2016 Workforce-Skills Preparedness Report by PayScale (see Hart 2018:1) established that 60% of managers from various fields of work believed that newly graduated accounting students lack HOT and problem-solving skills. Consequently, accounting education programmes need to be restructured to include each of these thinking skills as depicted in Figure 3.4 and Table 3.1, to prepare graduates with the types of analytic skills that employers will require from them. The inclusion of HOT skills in the accounting education programmes will enable accounting graduates to connect different concepts, interpret and solve problems, make correct decisions and communicate effectively (Supeno et al. 2019:1). Managing partners of major accounting firms emphasise that accountants who want to be successful in their chosen career should be able to use creative problem-solving skills. They should be able to solve diverse problems in different settings, understand facts, recognise and, if possible, anticipate problems, and find satisfactory solutions (Brazelton 2015:68; Kavanagh & Drennan 2008:296).

The IAESB (2017:61–62) proposes various strategies to be employed by accounting academics to equip accounting graduates with the needed HOT skills for effective performance at the workplace. These strategies include role playing, analysing case studies involving business situations, opening discussions of accounting

pronouncements¹ and participation in seminars. The literature also suggests various strategies for teaching HOT skills at university level. For example, Supeno et al. (2019:2) suggest the adoption of an activity-based teaching strategy to provide the opportunity to undergraduates to discover principles and develop critical thinking and creativity. Wang (2020:159) encourages the use of debates to enable students to develop a thorough knowledge about accounting principles and theories, and to apply such knowledge in a logical and consistent manner. Other studies (e.g. Abbott & Palatnik 2017:18; Wang 2020:158) encourage the use of classroom discussions, small group projects, presentations and problem-solving approaches to develop the HOT skills of accounting students.

3.5 CONCEPTUAL FRAMEWORK OF THIS STUDY

It is imperative for every researcher to develop a suitable conceptual framework to systematise the various concepts and terminologies for the purpose of undertaking a comprehensive review of the literature as well as the collection, interpretation and explanation of data (Imenda 2014:194; Tamene 2017:55). A conceptual framework “is a system of concepts, assumptions, beliefs and theories that support research” (Maxwell 2016:222). It is either presented in graphic or narrative form and sets out key constructs or variables together with the relationships between them (Elangovan & Rajendran 2015:25). A conceptual framework assists the researcher in identifying and constructing his or her world view on the phenomenon to be studied (Grant & Osanloo 2014:16). It also helps the reader to understand why the researcher had decided to study a particular topic, the assumptions made, the methodology as well as the findings of the research (Tamene 2017:55).

A framework also makes it possible for the researcher to place his or her findings within the current body of knowledge related to graduate employability skills (Tamene 2017:55). Compiling this preliminary framework enabled the synthesis of QH innovation, employability skills and Bloom’s revised taxonomy, which have informed the current study.

¹ “The statements, standards, interpretations and other financial reporting guidelines issued by the Financial Accounting Standard Board” (Accounting Coach 2022:1).

The draft conceptual framework of this study (refer to Figure 3.5) illustrates the network and the collaborative relationship between the four innovation agents, namely government, academics, employers and graduates for the development of the twenty-first century skills for accounting graduates. The **government** formulates policies, provides financial support and regulates the market; **academics** are the main source of human resource in various fields of work; **employers** invest in equipment, demand and assess knowledge and skills through the **graduates** of the universities. The four key agents (government, academics, employers and graduates) are therefore responsible for the development of relevant skills of newly graduated accounting students to be able to satisfy the needs of industry.

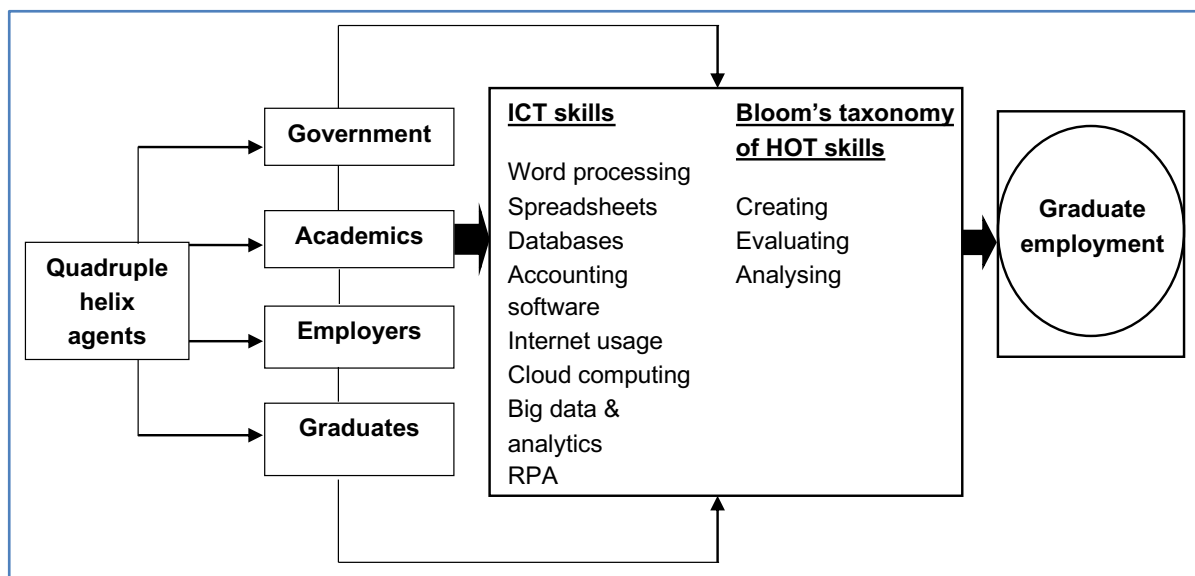


Figure 3.5: Conceptual framework for the development of skills for accounting graduates

Source: Author's own compilation.

As stated earlier, the importance of technology advancement demands the acquisition of new skills in the twenty-first century. Based on the literature reviewed, eight ICT and three HOT skills were identified to constitute the core of the conceptual framework designed during this study. It should be noted that not all these skills may be required by graduates for their accounting career. Additional skills were derived from the data collection methods described in Chapter 4 of this thesis. However, this preliminary framework established a structure from which to gather any potential data and to organise the subsequent analysis. The conclusions were compared to the various findings in literature and attempts were made to identify areas in which the current

study confirmed or contradicted the literature. This framework constitutes a skills development framework for accounting graduates in Ghana, and has not been suggested by prior researchers.

3.6 CHAPTER SUMMARY

This chapter presented the theoretical framework, which supports the theories of the study. The theoretical framework underpinning this study was based on the QH innovation model (see Carayannis & Campbell 2009:206) and Bloom's revised taxonomy of educational objectives (see Anderson et al. 2002:215). However, the TH model (see Etzkowitz & Leydesdorff 2000:111), which focuses on the overlapping relationship between the spheres of government–university–industry in the knowledge society context was explained first to enhance the understanding of the QH innovation model. Although, there is some consensus on the need for collaboration between the QH agents to enhance skills development, employment and economic growth (Lindberg et al. 2014:109; McAdam & Debackere 2018:3), there is theoretical gap regarding the roles of every agent within the QH and how they should collaborate to achieve the skills development and employment agenda of accounting graduates. This study advanced QH theorising by identifying the individual and collaborative roles of QH agents, namely government, academics, employers and graduates in developing skills, ideas and creativity to enhance employability of accounting graduates in Ghana.

Bloom's revised taxonomy was used to explain the HOT skills needs of accounting graduates. While studies (see Anderson et al. 2002:215; Supeno et al. 2019:1; Zapalska et al. 2018:9; Wang 2020:160) have been conducted widely on the higher-order cognitive process of the revised Bloom's taxonomy, no study was conducted on the application of Bloom's revised taxonomy in the accounting learning environment, especially at the tertiary level in Ghana. The current study intends to fill this gap by assessing the effectiveness of the accounting curricula of Ghanaian universities in promoting HOT skills of accounting graduates to meet employers' expectations. In this era of technological advancements, the literature indicated that employers struggle to find accounting graduates with the right skills to be able to utilise technology to innovate, create and provide specific services (Chalkiadaki 2018:10; Dunbar et al. 2016:70; Zureigat 2015:234).

Based on the theoretical framework, a conceptual framework was designed to synthesise the QH innovation and Bloom's revised taxonomy in addition to the ICT and HOT skills to help place the findings of this study within the current body of knowledge related to graduate employability skills.

Having thoroughly established the theoretical framework, the next chapter describes the research process of the study. This includes the research design and the methodology employed in the collection and analysis of the data.

CHAPTER 4

RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

In the previous chapter, the theoretical and conceptual underpinnings of the current study were discussed. This chapter presents the research approach to the study, namely using qualitative research methodology based on a design-based approach. The rationale for the current study originated from the employability challenges of accounting graduates in Ghana after successful completion of their qualifications. The literature reviewed in Chapter 2 particularly showed that accounting graduates need relevant ICT and HOT skills (that come with the 4IR), which are required in the workplace. The QH innovation model (see Carayannis & Campbell 2009:206) and Bloom's revised taxonomy of educational objectives (Anderson et al. 2002:215) constituted the theoretical basis of the current study.

The main objective of empirical research is to provide answers to specific questions using a scientific approach. It is focused on improving knowledge, techniques and practices (Nahrin 2015:1). The current study aimed to examine the ICT and HOT skills accounting graduates in Ghana should possess upon completion of the accounting programme to enhance their employability. This assisted in developing a framework for universities in Ghana for incorporating ICT and HOT skills in the accounting curriculum as a possible solution to the employment challenges.

The chapter starts with an explanation of the research paradigm and justifications for the pragmatic approach to this research based on DBR methodology. The chapter then proceeds with an explanation of a qualitative research design in addition to the most suitable methods chosen to provide answers to the research questions. Details of research participants, sampling procedures, qualitative data collection methods, data management and analysis are provided. A visual presentation of the layout and structure of Chapter 4 is provided in Figure 4.1.

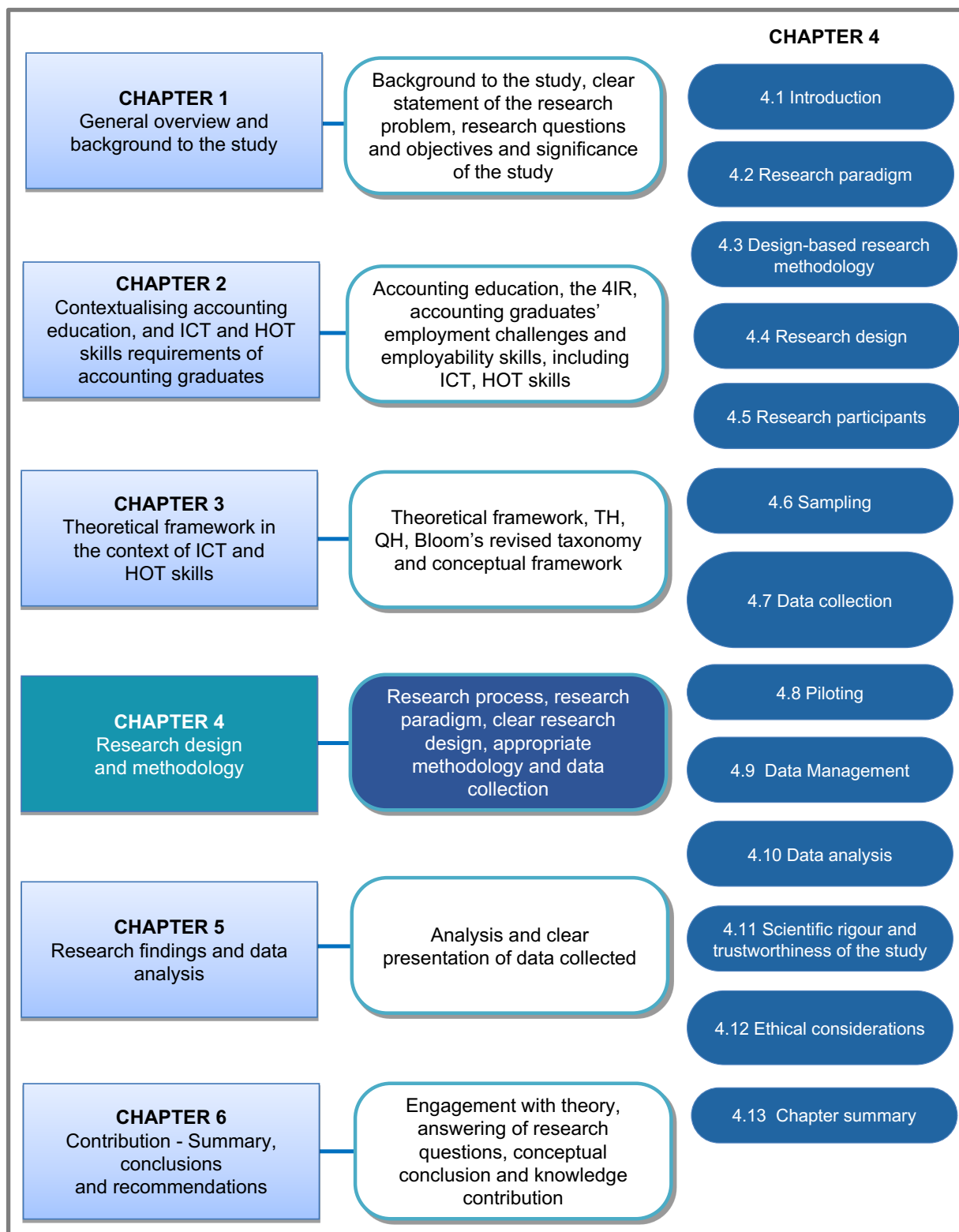


Figure 4.1: Structure of Chapter 4

Source: Author's own compilation

The current study sought to provide answers to the following research questions:

RQ1: Should public universities in Ghana introduce new ICT and HOT skills in the curriculum of accounting degrees?

RQ2: Which ICT and HOT skills do accounting graduates in Ghana need for their career?

RQ3: Which roles will government, academics, employers and graduates play in the development of ICT and HOT skills of accounting graduates in Ghana?

RQ4: How will government, academics, employers and graduates collaborate to promote the development of ICT and HOT skills of accounting graduates in Ghana?

4.2 RESEARCH PARADIGM

In undertaking any research, the researcher needs to set out with a clear vision regarding the paradigm that underpins his or her study (Alghamdi & Li 2013:1). The word 'paradigm' was first used by Kuhn (1962:24) in *The structure of scientific revolutions* to mean logical thinking. In educational research, 'paradigm' refers to the worldview of the researcher (Mackenzie & Knipe 2006:2). This worldview is the philosophy or viewpoint or belief system informing the understanding and analysis of the research findings (Kivunja & Kuyini 2017:26). Creswell and Creswell (2018:44) used the term 'worldview' instead of 'paradigm' to describe the fundamental beliefs that guide any research. A research paradigm explains the researcher's worldview and the nature of the research (Creswell & Creswell 2018:44). From another perspective, Kuhn (2012:264) refers to 'research paradigm' as a culture of research with values, belief systems and expectations, which researchers have in common when conducting research. A paradigm therefore reveals the collective presumptions and values that outline the way the researcher perceives and construes the world and operates within the academic community. Based on the paradigm of the current study, the author examined the methodology of the study to ascertain which research approaches to employ, and how to analyse the data to be collected.

Research paradigms can be classified as positivist, interpretivist, critical or pragmatist (Creswell & Creswell 2018:45). A paradigm encompasses four main essentials, specifically described as ontology, epistemology, axiology and methodology. All

paradigms have different viewpoints about the ontology, epistemology, axiology and methodology (Kaushik & Walsh 2019:1; Kivunja & Kuyini 2017:38; Scotland 2012:9). **Ontology** is about the presumptions the researcher makes in order to conceptualise the form of reality, in addition to what he or she believes could be known concerning such a reality (Scotland 2012:9). **Epistemology** is concerned with how the truth is known, and the knowledge that the researcher acquires in order to expand and enhance knowledge in his or her field of research (Mezmir 2020:17). **Axiology** connotes the ethical issues that require consideration in planning research (Nguyen 2019:3). For Kivunja and Kuyini (2017:28), axiology is concerned with the definition and evaluation of issues of ethics regarding the study. **Methodology** describes how the research is conducted, including the methods employed to provide answers for stated research questions within the framework of a specific paradigm (Nguyen 2019:3).

Since each of the paradigms presents its own viewpoint concerning the ontology, epistemology, axiology and the methodology, it is necessary for the paradigm underpinning every study to be clearly stated, taking into consideration the implications of the ontology, epistemology and axiology of the paradigm for the methodology (Kivunja & Kuyini 2017:26; Nguyen 2019:3). The selection of which paradigm to use for the subject of inquiry should be based on the way the researcher views reality, what he or she knows, and how it is known, in conjunction with his or her theoretical perspectives concerning the topic under study, the existing literature relating to the topic as well as the researcher's ethical values (Nguyen 2019:3). The paradigm underpinning the current study was pragmatism. The principles and reasons for the choice of pragmatism as a suitable paradigm for the current study are explained in the sub-section that follows.

4.2.1 Pragmatism as a paradigm for the current study

The philosophy of pragmatism was introduced around the end of the nineteenth century in the United States by theorists Charles Sanders Peirce (1839–1914), Herbert Mead (1863–1931), John Dewey (1859–1952) and William James (1842–1910) as a grounding philosophy for resolving the conflict between the positivist and interpretivist paradigms in study of social behaviour about the nature of reality, knowledge and inquiry (see Kaushik & Walsh 2019:2; Pansiri 2006:195; Parvaiz, Mufti & Wahab

2016:68). The word 'pragmatism' has its origin in the Greek term *pragmatikos*, translated to mean 'action', from which the words, 'practical' and 'practice' have been derived (see James 2000:193; Parvaiz et al. 2016:68). The common ground for all pragmatic theorists is the emphasis on resolving challenges using action-oriented approaches – those that work effectively in practice, in lieu of being ideal in theory (Goldkuhl 2012:136).

Pragmatist scholars believe that the truth about the real world cannot be solely accessed using one science-based approach as argued by the positivists, nor is it likely to ascertain societal phenomena according to interpretivism (see Biesta 2010:97; Godfrey-Smith 2015:804; Kaushik & Walsh 2019:2; Kivunja & Kuyini 2017:38). Pragmatists assume that truth keeps changing in each circumstance; it is by no means static. In the same way, the world is also not static; it changes with time through our actions (see Goldkuhl 2012:142; Kaushik & Walsh 2019:3). To pragmatist scholars, reality is actively created as individuals act in the world (Goldkuhl 2012:142). Generally, these scholars maintain that human behaviour can by no means be disconnected from experiences and the convictions that emanate from such encounters (Goldkuhl 2012:141). The thoughts and actions of the individual are therefore inextricably connected. Individuals take action on the basis of the potential consequences of their actions, and on the basis of the outcomes of such acts, they expect the ramifications of the same acts in future (Morgan 2014:4). To the pragmatists, externalities never determine who a person is; everyone has the ability to shape his or her experiences by means of his or her intelligence and actions (Creswell & Creswell 2018:48).

Epistemologically, pragmatic thinkers understand that knowledge can be verified (Patton 2005:153) and the role of knowledge, which results from inquiry, is to be beneficial for action and change (Goldkuhl 2012:140). Dewey (2008:172) defines inquiry as a stepwise problem-solving approach, which starts with identifying a problem and formulating actions to address the problem (see Morgan 2014:3). Consequently, pragmatists integrate diverse viewpoints to generate and analyse accurate data, thereby focusing on realistic research. In the current study, objective knowledge in addition to personal knowledge was critically examined, evaluated and applied according to established scientific criteria.

The axiology of pragmatism requires researchers to seek the best likely effect of the study on the research participants as well as humankind in general, and to reflect constantly on their values and those of the research participants to ensure a balanced view of the outcome of the study (see Wahyuni 2012:70). As a pragmatist researcher, the author acknowledges the value of the current study and reported the ideals and prejudices associated with the topic being studied, which may interfere with neutrality (Kivunja & Kuyini 2017:35). The researcher also tried to be sensitive to what participants felt and considered important to them.

Pragmatic researchers are not absolutely committed to a particular research methodology (Feilzer 2010:8; Hall 2013:23; Kaushik & Walsh 2019:7). The methodology chosen for the current study was informed by the research problem and objectives (see Creswell & Creswell 2018:48). Pragmatic researchers may use any research design and methodology whether qualitative, quantitative, mixed methods or DBR, depending on which approach works best in providing practical solutions to the research problem, given available data and without sacrificing validity and quality of the research (see Biddle & Schafft 2015:4; Denscombe 2008:280; Goldkuhl 2012:142; Hall 2013:23; Morgan 2014:1). Consequently, several educational researchers (such as Alghamdi & Li 2013:1; Barab & Squire 2004:6; Goff & Getenet 2017:109; Juuti & Lavonen 2006:57; Plomp & Nieveen 2007:12) propose DBR as a methodology to use with pragmatism because these both focus on practical means to acquire new knowledge to improve educational practices. Based on the above suggestions, besides the point that no clear guidelines exist for selecting an appropriate methodology to use with pragmatism, the current study adopted a DBR approach (refer to section 4.3).

The pragmatic paradigm was employed to guide the current study because not only does it match how the researcher understands reality, but it also matched the aim and objectives of the current study, as well as the issue being investigated. Pragmatic research seeks to transform a particular problem by examining its complex interconnected elements to gain a comprehensive knowledge of the entire situation. The purpose is to provide alternatives and to take appropriate action (see Goldkuhl 2012:136; Kaushik & Walsh 2019:4). This purpose matched well with the objective of the current study, namely to design a framework that would assist to promote interdisciplinary collaboration among government, academics, employers and graduates in Ghana. In addition, the choice of pragmatism for the current study granted the

researcher the autonomy to freely choose the research methods and procedures to best respond to the research questions (see Alise & Teddlie 2010:106; Creswell 2014:10). This allowed the researcher to obtain in-depth knowledge about the employment problems of accounting graduates in Ghana and to develop a framework to assist policymakers and accounting practitioners in providing a concrete solution to the problem. Indeed, as an accounting scholar actively engaged in the complexities of academia, the author preferred an action-oriented approach, which was not limited by issues of ontology and epistemology in attempting to find answers to various types of research questions.

4.2.1.1 *Limitations of pragmatic philosophy*

Pragmatism has been rejected by various current philosophers as a philosophy because it fails to involve in metaphysical argument as explanation to several theoretical issues (see Johnson & Onwuegbuzie 2004:16; Nowell 2015:145). Alternately, it chooses to follow information that would empower people to handle major challenges (Friedrichs & Kratochwil 2009:726). The pragmatic paradigm also comes under criticism for concentrating on real outcomes while overlooking theory (McCready 2010:194). As a practitioner, not a philosopher of science, the author understood the desire to carry out research instead of arguing about the philosophy that underpins it. To become a responsible and reflective scientific researcher, the author also acknowledged the necessity to understand the ramifications of the philosophical basis of his scientific practice. Pragmatists have respect for reality and the effect this reality has on experiences. Morgan (2007:67) suggests that pragmatic thinkers do not deny that ontological problems exist, rather the pragmatist viewpoint rejects the privileging of ontological presumptions, believing they are too narrow to approach philosophy of knowledge. The current paradigm argument about the place and value of qualitative and quantitative research methodologies continues to apply in research in the social sciences and humanities (Doyle, Brady & Byrne 2009:176). Pragmatism has been criticised for considering the research question to be more important than either the method or the paradigm that underlies it (Doyle et al. 2009:183). Pragmatic researchers reject the traditional dualist paradigms and in its place support pluralism and eclecticism where the choice of methodology is based on the need to answer a research question instead of philosophical alignment (see Glogowska 2011:252; Onwuegbuzie, Johnson & Collins 2009:129).

Pragmatic researchers argue that although research paradigms can remain separate, they may also be incorporated into another research paradigm (see Onwuegbuzie et al. 2009:129). Even though many might consider this a limitation of pragmatic philosophy, the author believes that there is strength in combining current research traditions in a pragmatic manner to explore more complex practice problems. The process of pragmatism includes verifying what works through setting ideas and theories to work in daily real-life experiences (see James 2000:193). One more limitation of pragmatism is that it bases the choice of methodology exclusively on what works, which may not adequately answer the questions ‘what works for whom’ and ‘for what purpose’? (Doyle et al. 2009:183). As suggested by Johnson and Onwuegbuzie (2004:18), the current study addressed this drawback by clearly identifying to whom and to which extent the research will be useful. As stated in sub-section 1.7, the results of the current study will assist accounting academics, professional accounting bodies, government and other stakeholders in the accounting sector in the formulation of policies relating to employability skills of accounting graduates. Although pragmatism has been rejected by various academics because of the above-mentioned limitations, the pragmatic philosophy has been chosen by many to support their scientific practice (see Nowell 2015:146).

4.3 DESIGN-BASED RESEARCH METHODOLOGY

As revealed in section 4.2.1, DBR methodology has been recommended as an appropriate methodology within a pragmatic paradigm research (see Goff & Getenet 2017:109). DBR methodology remains one of the leading methodologies that can successfully address persistent complex problems of educational practices (Alghamdi & Li 2013:9; Ford, McNally & Ford 2017:64; McKenney & Reeves 2013:138). Reeves, Herrington and Oliver (2005:105) examined DBR as a research methodology and argue that, when incorporating technology into an educational system, and conducting rigorous research for refining innovative educational environments in addition to defining and designing new frameworks, DBR is the best methodology to examine educational systems successfully. This study was concerned with developing a framework and content that would equip future accounting graduates with relevant ICT and HOT skills to enhance their employment and performance in the technology-based workplace. Sections 4.3.1–4.3.3 provide a detailed description of DBR methodology

with reference to its definition and purpose, characteristics and process, as well as strengths and limitations.

4.3.1 Definition and purposes of DBR

DBR emerged in the twenty-first century as an innovative, multi-faceted and pragmatic mode of research that could successfully close the gap between educational research and practice, and accordingly address genuine educational problems (see Alghamdi & Li 2013:9; Herrington, McKenney, Reeves & Oliver 2007:4089; O'Donnell 2004:257; Štemberger & Koper 2016:188; Wang & Hannafin 2005:7). DBR has been presented under various names such as “design experiments” (see Brown 1992:142), “design research” (see Wang & Hannafin (2005:6), “developmental research” (see McKenney & Van Den Akker 2005:47), “educational design studies” (see McKenney & Reeves 2013:8). Historically, DBR is closely connected to the development of educational technologies; however, it is now conducted across a broad spectrum of educational settings, with or without technology (Abdallah 2013:933; Sandoval 2013:388). DBR is an appropriate method of conducting research in a natural educational environment (Oh & Reeves 2010:273).

According to Barab and Squire (2004:2), DBR is a sequence of methods aimed at developing new theories, artefacts (e.g. a programme, curriculum or software), and practices which might influence teaching and learning in a natural environment. Wang and Hannafin (2005:7) also describe DBR as an orderly but flexible method with the aim of improving practices in education by analysing, designing, developing and implementing these with other academics and professionals in a realistic setting, which leads to formulating theories and principles that are context-specific. Plomp (2013:15) provides a comprehensive definition of DBR as a well-organised study of developing various interventions to solve complicated educational problems in addition to advancing human understanding and to develop or validate theories. Additionally, DBR emphasises the necessity of developing principles and building theory to inform and enhance educational research and practices (Štemberger & Koper 2016:188).

The definitions above clearly explain DBR in the context of the functions of designing, developing, implementing, evaluating and analysing educational interventions. They also suggest that the primary objective of DBR is to contribute to information that will

eventually minimise fundamental gaps between educational research and practice (McKenney & Reeves 2013:133). DBR also aims at developing and refining theories (Edelson 2002:105). Other studies also noted that this research approach seeks to address multifaceted challenges in educational settings to foster a vigorous link between research in the field of education and major challenges of the world (Abdallah 2013:932; Amiel & Reeves 2008:34; Sari & Lim 2012:29).

4.3.2 Characteristics and process of DBR methodology

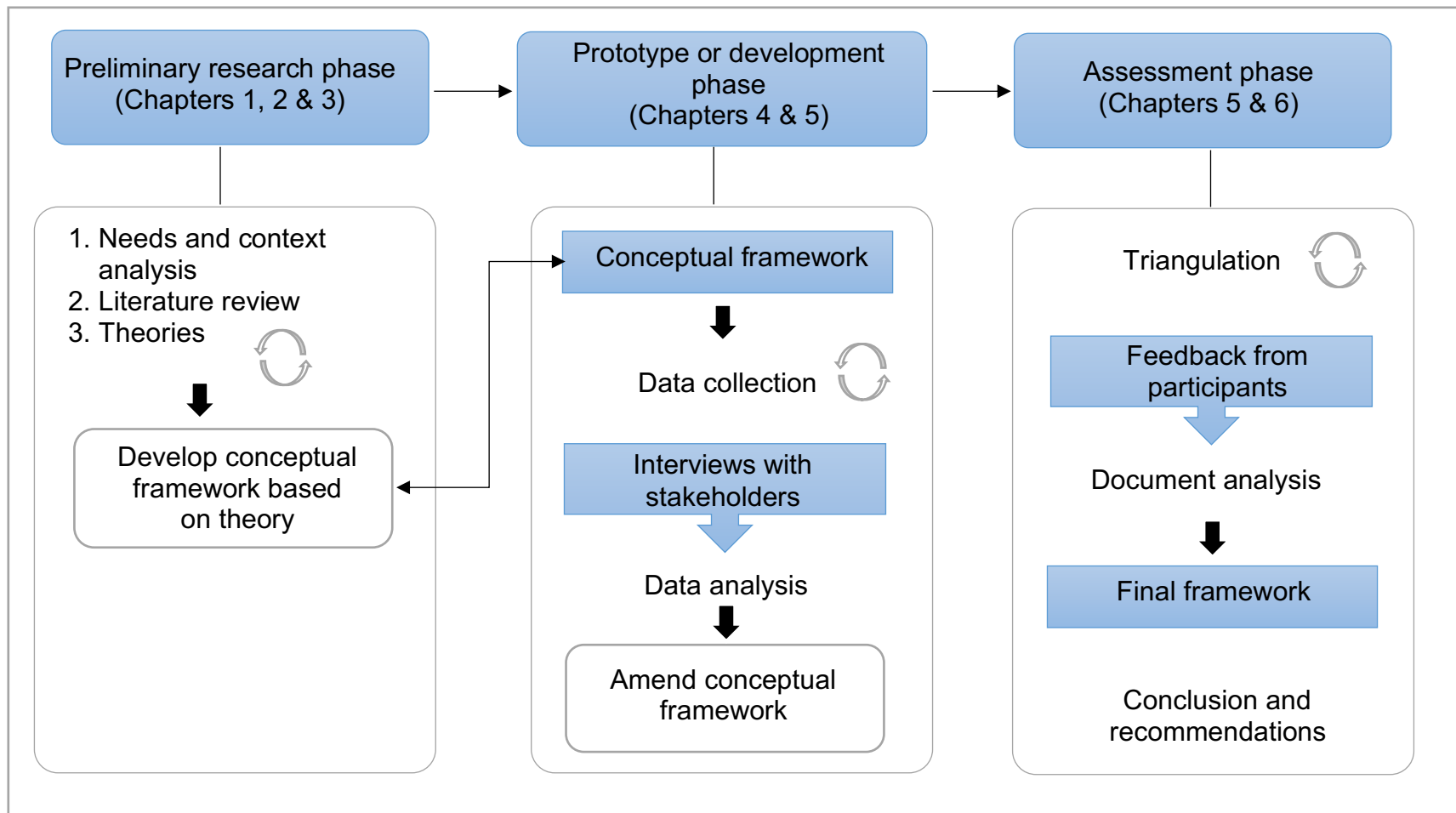
Several features describe DBR methodology making it an outstanding method in educational research (see Abdallah 2013:935; Wang & Hannafin 2005:5). McKenney and Reeves (2013:139) characterise DBR as “pragmatic, grounded, interventionist, iterative, collaborative, adaptive and theory-oriented”:

- DBR is **pragmatic** since it focuses on producing practical answers to complex educational challenges.
- It is **grounded** as it utilises evidence-based results and insight to guide a study.
- It is **interventionist** in view of the fact that it can be conducted to bring about transformation in a specific academic setting.
- DBR is **iterative** because it usually centres on numerous cycles of design, development, testing and revision.
- It is **collaborative** because it needs the knowledge of multi-dimensional partnerships, as well as professionals and researchers.
- DBR is **adaptive** because the interventions and study designs are regularly revised and accordingly based on new knowledge.
- Lastly, it is **theory-oriented** since, apart from using theory to form the basis of the design, the design as well as the work of development is carried out to promote a wider academic discourse.

The characteristic descriptions presented by McKenney and Reeves (2013:139) depict DBR as an organised method of developing, executing, assessing and enhancing interventions in education in collaboration with stakeholders. DBR requires a participatory approach, and should be conducted in a long-term collaboration with a well-defined group of practitioners (Anderson & Shattuck 2012:16). However, in a doctoral study where the researcher is required to work alone, it is sufficient to include

the opinions of practitioners during the design instead of using a co-construction procedure in developing the design (Herrington et al. 2007:4093).

Generally, the research procedure in DBR is cyclical in nature, comprising organised processes of problem analysing, designing, evaluating and revising events, which are iterated until an acceptable equilibrium is obtained between ideas and actualisation (see Plomp & Nieveen 2007:13). Plomp and Nieveen (2007:15) suggest three separate phases of DBR: the preliminary research, prototyping or development, and assessment phases. A diagrammatic presentation of a three-phase approach of DBR is depicted in Figure 4.2:




 Depicts consultations and iterative cycles of refinement.

Figure 4.2: A three-phase approach of design-based research.

Source: Author's own compilation (based on Goff & Getenet 2017:111; Meyers, Jacobsen & Henderson 2018:59; Plomp & Nieveen 2007:15).

The introductory phase of the process of the research is the **preliminary research phase**, which comprises defining the research problem, consulting defined practitioners, reviewing relevant documents and literature and formulating research questions (refer Chapter 1). This phase also encompasses the conceptual framework development for the research (refer section 3.5). In the current study, the conceptual model was based on the QH innovation model (see Carayannis & Campbell 2009:206) and Bloom's revised taxonomy of educational objectives (see Anderson et al. 2002:215) as discussed in Chapter 3.

The second phase is the **prototyping or development** phase, also described as the phase of iterative design. Using the prototyping phase in DBR is a means of ensuring trustworthiness of the research project before conducting the final work in the field (Kennedy-Clark 2013:34). Generally a combination of methods are employed to collect data that is more reliable than would otherwise have been the case from the research participants based on their experiences (Anderson 2005:3). Combining the methods of collecting data permits a very thorough understanding of the issues under study (Wang & Hannafin 2005:6). In the current study, the author collected data by way of document analyses and interviews (refer to sections 4.7.1 and 4.7.2). As a requirement of this phase, different groups of interviewees were involved in the collecting and analysing of the data (refer to section 4.5). The interviews were conducted in sequence lasting five months in total and, on the basis of the feedback received from the interviewees, the conceptual framework was evaluated and amended.

The **assessment** phase constitutes the last segment of the research process. This phase comprised a total evaluation of the research by way of a final conceptual framework to determine whether the questions of the research had been answered (see Goff & Getenet 2017:111; Kennedy-Clark 2013:28). This phase will be discussed in Chapters 5 and 6. During this phase, the researcher developed a framework that had to provide guidelines to equip graduates with relevant ICT and HOT skills to enhance their employability and performance in the technology-based workplace through triangulation and feedback from accounting academics, accounting graduates, employers or government officials. The development of the framework was also done with reference to the QH innovation and Bloom's revised taxonomy. In this phase, recommendations for future research were also generated.

4.3.3 Strengths and limitations of DBR

The first strength of DBR, applicable to this study, is associated with the practical involvement of practitioners in developing innovations (Štemberger & Koper 2016:187). When practitioners are part of the innovation process, it becomes easier for them to accept the innovation than would otherwise have been the case and successfully carry out such innovation (Štemberger & Koper 2016:187). The second strength of DBR lies in the fact that the use of different procedures in DBR, as it applied to this study, produces a portfolio of information, which can strengthen the credibility of the research findings (see Abdallah 2013:932). Additionally, Bannan, Cook and Pachler (2016:941) argue that DBR grants researchers in the field of education an efficient method to explore innovative scientific capabilities in complex learning situations. Furthermore, because DBR studies occur in real contexts, they are able to satisfy local needs and provide valuable insights for educational practice (Dolmans 2019:887). Because improving educational practice, particularly in accounting education, happens to be a primary objective of research in Ghana, it is necessary to introduce DBR as a methodology to improve educational practices and theory.

Notwithstanding the strengths of DBR, some researchers, policymakers and practitioners have levelled criticism against DBR as methodology (Dede 2005:5). Compared with other research methodologies, DBR has been criticised for the considerable amount of data accumulated throughout iterations of DBR, and subsequently, much-needed management and analysis. As a result, the researcher can be biased in the selection of the data to be analysed, which may lead to misinterpretations of the data (see Abdallah 2013:936; Collins, Joseph & Bielaczyc 2004:19; Ryu 2020:3). In this study, care was taken to collect quality data, instead of large data sets. It has also been argued that it is difficult to make generalisations about the findings in DBR owing to changes that are done in different iterations, together with the fact that research participants could differ between iterations (see Kelly 2004:120; O'Donnell 2004:257). However, in the opinion of Hanekom (2019:81), this limitation does not only apply to DBR, but also to other qualitative research methodologies. As another criticism, DiSessa and Cobb (2004:78) contend that several DBR studies have not been adequately conceptualised in theoretical terms, which hindered the development of new theories. It is the view of the author that a very strong theoretical

and conceptual basis was laid, as reported in Chapter 3 of this thesis. The current study therefore did not suffer any theoretical inadequacy.

4.4 RESEARCH DESIGN

The design of a research project denotes the general approach, which the researcher selects in order to incorporate the various parts of the research in a clear and consistent manner to address the problem under study effectively (Akhtar 2016:68). According to Creswell and Creswell (2018:49), the research design summarises the procedures used to conduct research, together with the time and conditions under which the data will be collected, while Jongbo (2014:88) describes a research design as a plan for collecting and analysing data. Levitt et al. (2018:32) refer to the research design as the combination of research methods, including data collection and analysis used in a particular research project. When designing research, the researcher needs to take into consideration the data that is required to provide answers to the research questions in a conclusive manner. Again, the design must be specific and flexible enough to adjust for complications, while still directing the researcher towards appropriate data to address the main research questions (Jongbo 2014:90).

Educational research methodology literature describes qualitative, quantitative and mixed methods as the major approaches for the collection and analysis of data (Creswell & Creswell 2018:49). Qualitative research involves collecting and analysing descriptive data to understand human or social problem (Aspers & Corte 2019:155). Quantitative research is an approach for testing theories by examining the relationship among variables, which can be measured, typically with instruments such as questionnaires and tests so that numbered data can be analysed using statistical methods (Creswell & Creswell 2018:49). Mixed methods research combines both quantitative and qualitative data in answering the research questions (Creswell & Creswell 2018:49). From a pragmatic viewpoint, a researcher can select the research approach which best satisfies his or her requirements (Creswell & Creswell 2018:48) and which is based on the researcher's area of expertise (Budd 2014:74). Accordingly, Morgan (2014:1) states that DBR utilises quantitative and/or qualitative research approaches depending on the research questions. Some studies using DBR methodology (see Abdallah 2013:937; Budd 2014:74; Hanekom 2019:96) applied the mixed method approach in the collection and analysis of data. However, the current

study used a qualitative method in the collection and analysis of data based on the view of other researchers (see Dominguez 2018:5; Goff & Getenet 2017:112; Kelly 2004:126; Rhodes 2012:26) that DBR is a typical qualitative research design. The next section describes how the qualitative methodology was used to answer the research questions.

4.4.1 Qualitative research approach

The qualitative research approach is defined as an iterative process by which enhanced understanding is gained from the meaning individuals or groups assign to social phenomena in their natural setting (see Aspers & Corte 2019:155). Specifically, qualitative research is applied to the study of peoples' experiences and interpretations of situations, and to offer quality descriptions and analyses on the basis of these viewpoints (Johnson & Rasuloova 2016:7). A qualitative approach to research is useful when the aim of the researcher is to investigate an issue, and there is the need for him or her to associate with the research participants (Sutton & Austin 2015:230). Characteristically, the researcher acts as the main instrument for gathering and analysing data. The researcher plays a very active role in creating in-depth knowledge of the research setting through self-interpretation of what is happening (Butina, Campbell & Miller 2015:186). The qualitative researcher depends on approaches, including participants' observations, focus groups, in-depth interviews and document reviews to collect data and to understand and explain a particular social phenomenon (Meurer et al. 2007:1065; Rahman 2017:105). Data in qualitative research includes video or audio tapes, transcriptions, field notes and memos (Lin 2009:132). Because it involves small numbers of participants, findings obtained through qualitative research are presumed not to represent the views of the broader population (Marshall, Cardon, Poddar & Fontenot 2013:21). The ultimate report of a qualitative study usually comprises narrative accounts with contextual descriptions and direct quotes from study participants. Consequently, a qualitative research approach is subjective (Kalu 2019:98).

The current study employed a qualitative approach to answer the research questions. This method was deemed appropriate for the current study, as the aim was to obtain a thorough understanding of the employment challenges among accounting graduates in Ghana based on the research participants' experiences and perspectives. Adopting

the qualitative approach for the current study also permitted a variety of questions to be posed to research participants to freely share valuable information on the phenomenon under consideration (Creswell 2014:18). It also provided a means of discovering profound knowledge of experts and people's experiences on employability challenges of accounting graduates in Ghana.

The design of qualitative research is flexible and iterative in nature (Tirumalesh 2019:622). The research process used to provide answers to the questions of the current study was an adapted version of the research process employed by Delizo (2011:1) as shown by Figure 4.3.



Figure 4.3: Representation of qualitative research process

Source: Adapted from Delizo (2011:1).

The original research process of Delizo (2011:1) was designed by starting with the critical case study method and ending with cross-case interpretative analysis. The research approach for the current study was designed based on a pragmatic approach using thematic analysis starting with the research questions through to data interpretation. These major processes are elaborated on in sub-sections 4.6–4.10. Before then, details of the research participants are provided in section 4.5.

4.5 RESEARCH PARTICIPANTS

Involving different people with different perspectives in research has the possibility of improving the trustworthiness of the findings of the research (Rubin & Rubin 2005:173). In the current study and in line with the QH theory, four different groups of interviewees, namely accounting academics, accounting graduates, employers, and government officials were involved. **Accounting academics** play both a pivotal role in producing future accountants as well as an active role in research and innovation to address issues affecting the accounting profession. **Accounting graduates** are in the work environment or potential work environment and therefore are in the best position to indicate their ICT knowledge and HOT skills requirements or what accounting programmes should contain. **Employers** are key stakeholders in higher education because they employ the output of higher education. They know the qualifications and skills required to perform accounting functions in their organisations and, therefore, they can offer an expert opinion on whether newly recruited staff are knowledgeable in ICT and possess HOT skills. Finally, **government officials** are responsible for formulating policies (education, ICT and employment), financing programmes as well as reforms that promote skills development and employment creation.

4.6 SAMPLING

For Vasileiou, Barnett, Thorpe and Young (2018:16), the best sampling method for qualitative research is the one which best provides answers to the research questions and also allows for other people to make use of the findings. Taking into consideration this criterion and the purpose of the current study, a non-probability sampling technique was employed to choose the study sample. The purpose of this research project is not to generalise to particular populations but to gain valuable understandings of a problem. In this situation, Onwuegbuzie and Leech (2007a:242) indicate that non-

probability sampling is the appropriate method to use when conducting qualitative research. A non-probability method of sampling does not apply the principle of probability in choosing the study sample, particularly in situations where the number of members of the population cannot be known with certainty (see Kumar 2011:189), as was the case with the current study. Using the non-probability method enabled the researcher to recruit participants strategically from the four stakeholder groups mentioned in section 4.5 for the current study. Purposive and snowball sampling methods were employed in selecting the research participants. In snowball sampling, existing research participants are used to recruit other participants among their associates (Naderifar, Goli & Ghaljaei 2017:2). The use of purposive sampling ensured that the right people were selected to respond to the research questions of the study (see Tongco 2007:155).

The **purposive** sampling method was applied in the selection of accounting academics, employers as well as government officials while the **snowball** method was used to recruit the accounting graduates. Accounting academics were recruited with the assistance of the heads of the accounting departments. Employers were selected from a directory of Ghanaian businesses, and the government officials were recruited from the secretariats of the National Council for Tertiary Education (GTEC) of the Ministry of Education. In each case, introductory letters were presented, and approvals were obtained from the department heads before those with the required knowledge and expertise pertaining to the issue under study and those willing to participate were contacted for an interview. Using the **snowball** sampling, accounting graduates whom the researcher had contacted made use of their social contacts to link the researcher to other accounting graduates (Family Health International 2011:5–6).

For the current study, 30 participants were carefully chosen from the database of accounting academics, accounting graduates, employers and government officials. Various studies (see Adler & Adler 2012:10; Boddy 2016:428; Warren 2002:99) suggested 30 as an ideal sample size for in-depth interviews. The sample comprises 10 accounting academics, 10 accounting graduates, 7 employers and 3 government officials. The number is not equal or proportional because only 3 senior staff members in the policy, accreditations and quality assurance sections of GTEC qualified to respond to the research questions for government officials. The 7 employers were added to get the required sample size for the current study. The number of participants

per group is depicted in Table 4.1. The researcher chose this sample size to obtain deep knowledge of the problem under study on the basis of experiences, beliefs and opinions of the interviewees (McGrath, Palmgren & Liljedahl 2018:2) and not in order to generalise the results. To achieve saturation and to ensure deep analysis, Onwuegbuzie and Leech (2007a:242) and Sandelowski (1995:183) indicate that, in qualitative research, sample sizes must neither be too small nor too big. Section 4.6.1 provides the inclusion and exclusion criteria for the four groups of participants.

4.6.1 Inclusion and exclusion criteria for each participant group

Inclusion and exclusion criteria define the participants who satisfy the researcher's needs for the study (Panacek & Thompson 2007:75). Sections 4.6.1.1 and 4.6.1.2 explain the inclusion and exclusion criteria for each participant group.

4.6.1.1 Inclusion criteria

This sub-section describes the inclusion criteria of research participants as follows:

Accounting academics: The study involved accounting academics from five public universities in Ghana, namely the University of Cape Coast, the University of Education, the University of Ghana, the Kwame Nkrumah University of Science and Technology, and the University of Professional Studies (refer to Figure 2.1) who had been teaching accounting for three years or more at the time of this study. Such academics were considered experienced, and it was assumed that they also had adequate knowledge of the curriculum and the related skills requirements in the job market. The current study focused on these universities as they are guided by policies and programmes of the Government of Ghana. Again, they were selected for the study because they enrol the most business students.

Accounting graduates: Newly employed accounting graduates from the five selected public universities who completed their university qualifications within the three years preceding the study and who were working in an accounting capacity were included in the current study. It was argued that such graduates would have been able to remember well enough the ICT and HOT skills acquired during their university education and would be able to connect them to their employment situation at the time of this study.

Employers: The study included employers of accounting graduates in the public as well as private sector organisations.

Government officials: The current study included senior staff in the policy, accreditations and quality assurance sections of GTEC of the Ministry of Education.

4.6.1.2 Exclusion criteria

This sub-section describes the exclusion criteria of research participants as follows:

Accounting academics: Accounting academics in the accounting departments of the five selected public universities with less than three years of teaching experience were excluded from the study. It was assumed that these academics might not have had adequate knowledge of the curriculum and the related skills requirements in the job market.

Accounting graduates: Accounting graduates who had completed their university qualification more than three years before the current study were excluded. This is because such graduates might not have been able to remember the ICT and HOT skills acquired in the university well enough and/or be able to connect them to the employment situation at the time of the study.

Employers: The study excluded employers who outsourced their accounting functions and therefore did not employ accounting graduates directly.

Government officials: Senior staff who were not in the policy, accreditations and quality assurance sections of GTEC of the Ministry of Education were not included in the current study.

4.7 DATA COLLECTION

Collection of data refers largely to the systematic procedures used to gather quantitative and/or qualitative data from various sources in relation to questions of a particular research (McMillan & Gogia 2014:1). In research, data is gathered in the form of primary and secondary data (Wahyuni 2012:73). As the name indicates, **primary** data is produced for the first time by the researcher through direct efforts, purposely for addressing research problems while **secondary** data is data that has

been collected already by others for other purposes but has some relevance to the current study (see Hox & Boeije 2005:593; Wahyuni 2012:73). The current study employed primary as well as secondary data to address the research problem. Table 4.1 below provides the data sources and breakdown of research participants, documents analysed, and field notes.

Table 4.1: Data sources and breakdown of research participants and documents

In-depth interviews			
	Data source	Number of participants	Type of data
1	Accounting academics	10	Primary
2	Accounting graduates	10	Primary
3	Employers	7	Primary
4	Government officials	3	Primary
	Total	30	
Documents reviewed			
	Data source	Form of document	Type of data
1	Undergraduate accounting curriculum (2017) University 1	Written document	Secondary
2	Undergraduate accounting curriculum (2018) University 2	Written document	Secondary
3	Undergraduate accounting curriculum (2018) University 3	Written document	Secondary
4	Undergraduate accounting curriculum (2018) University 4	Written document	Secondary
5	Undergraduate accounting curriculum (2018) University 5	Written document	Secondary
6	National Education Strategic Plan 2018–2030	Written document	Secondary
7	National ICT in Education Policy (2015)	Written document	Secondary
8	National employment policy (2014)	Written document	Secondary
9	Researcher's observations	Field notes	Primary

Source: Author's own compilation

Once the data category was known, the researcher employed a systematic process to collect data that was not only appropriate and relevant in quality and quantity but also reliable and valid (see Jackson 2013:57). For the purpose of in-depth and wide investigation, two major data collection methods were employed for the current study, namely document analysis and in-depth interviews. These methods are discussed in sections 4.7.1 and 4.7.2 respectively.

4.7.1 Document analysis

Document analysis is becoming more widely used across various disciplines (Kayesa & Shung-king 2021:3). However, there was insufficient detail in the reviewed literature about the method applied in addition to the conclusions of the analysis of documents (see Bowen 2009:27; Joshi, Morkos & Summers 2018:7; Viswambharan & Priya 2016:4; Wesley 2010:12). Document analysis employs a systematic procedure to analyse documentary evidence and provide answers to specified research questions (Bowen 2009:27). Like other qualitative research methods of analysis, document analysis involves repetitive reviewing, scrutiny, and interpretation of the data to understand the subject of research (Altheide 2011:290; Mackieson, Shlonsky & Connolly 2018:968). Document analysis may be employed in addition to other qualitative methods, such as participants' observation and/or interviews, or may be the data core of a study (see Bowen 2009:38; Joshi et al. 2018:7). In the current study, document analysis was used in addition to in-depth interviews to provide answers to the research questions.

Documents provide reliable information helpful in contextualising qualitative studies within their fields (see Bowen 2009:31). Bowen (2009:31) notes that analysis of documents remains an effective and efficient means of collecting data because documents can be read and reviewed several times, and they will remain unchanged by the study procedure or the researcher's influence. Document review gives the researcher information and ideas on questions to ask during the data collection and analysis phase (Bowen 2009:31–32). In the current study, document analysis preceded the interviews and informed the interview schedule. In addition, document analysis facilitated the collection of a significant amount of accurate data without essentially questioning several people (Bathmanathan, Rajadurai & Sohail 2018:5).

Document analysis is however limited as it is based on secondary data, which was not created with the research agenda in mind. Analysing documents can be demanding and requires some level of expertise (Bathmanathan et al. 2018:5; Mackieson et al. 2018:978). Furthermore, document analysis is subject to the possibility of bias in the document and on the part of the researcher. Accordingly, Bowen (2009:38) emphasises the importance of researchers to assess the subjectivity of documents thoroughly to maintain the trustworthiness of the study.

The documents used in a document review may be in the form of printed material such as handbooks, brochures, reports, journals, newspapers, minutes of meetings, diaries, advertisements, policy manuals syllabi or electronic material (Bowen 2009:28–29). In the current study (refer to Table 4.1 and Appendix G), documents on the undergraduate accounting curriculum of the selected five public universities, the Education Strategic Plan (Ministry of Education 2018), the ICT in Education Policy (Ministry of Education 2015) and National Employment Policy (Ministry of Employment and Labour Relations 2014) were examined and analysed at the beginning of the study to generate data relevant for the study.

Before carrying out the document analysis, the researcher defined the exact research questions to be addressed by the document analysis as recommended by Mackieson et al. (2018:974). The researcher then prepared and presented a list of documents needed to the heads of departments (HoDs) of the participating organisations, and received their permission to use all documents for the research, even though some of the documents were in the public domain. The HoDs were assured of the treatment of the documents to uphold the ethics of confidentiality in the research. After collecting the documents, the contents were thoroughly read and analysed. A table was developed to indicate the document type analysed and a summary of the key findings (refer to Table 5.1). The findings from the document analysis (refer to Table 5.2) were used to corroborate findings from the interviews in the analysis chapter.

4.7.2 In-depth interviews

An interview constitutes a vital data gathering method that involves oral questioning of interviewees (Qu & Dumay 2011:239). A qualitative interview usually involves a face-to-face interaction between the interviewer and the participants using a set of interview

questions (Jamshed 2014:87). Among the major objectives of carrying out an interview is to obtain data, which may be difficult to obtain by a researcher using quantitative-oriented methods, such as questionnaires, only (Ryan, Coughlan & Cronin 2009:309). According to McGrath et al. (2018:1), an interview enables the researcher to thoroughly investigate issues that are exclusive to the interviewees' knowledge. A researcher may choose structured, unstructured or semi-structured interviews in accordance with the objectives of the research and the type of information needed (Jamshed 2014:87; Qu & Dumay 2011:243).

A **semi-structured** interview comprises a set of questions that the researcher wants to cover. It is flexible in terms of how the questions can be asked and responded to, and the interviewer can ask supplementary questions and make additional classifications on the basis of the answers that the participant will give (Ryan et al. 2009:310). It is the expectation of the researcher that interviewees would express their viewpoints better in a semi-structured face-to-face interview than in a non-face-to-face questionnaire (DeJonckheere & Vaughn 2019:2). In semi-structured interviews, the interviewer's interest is in the content and context of the interview, the interviewees' understanding of the topic under study, and what they want the interviewer to know (Qu & Dumay 2011:246). A major disadvantage of this type of interview is that interviewees might feel inhibited when requested to respond to a sensitive question face to face. A semi-structured interview may result in conventional answers being given compared to when a self-administered questionnaire is utilised (McIntosh & Morse 2015:7).

In the current study, a semi-structured interview schedule was employed (refer to Appendix E). The researcher used this type of interview because it is classified among the most fundamental approaches by which the researcher can intimately understand people and their social worlds (see Hermanowicz 2002:480). Four different interview schedules were used for the four different groups of interviewees. However, there were common questions that were answered by all the interviewees (refer to Appendix E). This was done to identify agreements and gaps in answers of the interviewees concerning the main research questions and to provide valid and reliable data. The interview questions centred on participants' views on:

- the employability challenges of accounting graduates in Ghana;

- the depth of ICT and HOT skills coverage in the accounting curricula of the universities at the time;
- the appropriate teaching approach to be employed; and
- the participants' opinions of the need to make changes to accounting curricula to include new and relevant ICT and HOT skills in the near future.

In order to build rapport with participants, the researcher drafted a short summary of the research project, which was sent to interviewees prior to the interview to inform them of important topics and what was expected of them in the interview. Letters of invitation were handed to each research participant and informed consent was obtained from them, as suggested by Stuart and Barnes (2005:10) as well as Ryan et al. (2009:311). The researcher adopted the following steps to obtain informed consent from participants:

Step 1: The researcher verbally described the research to the participants and provided the required information about the research, such as aim, methods, benefits and risks, and allowed them opportunities to seek clarifications on issues they did not understand.

Step 2: Subsequent to the oral description, the researcher gave participants a written consent form, and gave them time to contemplate whether they wanted to take part in the study.

Step 3: Having given participants the opportunity to read and understand the consent form, the researcher provided answers to further questions they had.

Step 4: After participants had all their questions answered and have agreed to take part in the study, the participant and researcher signed and dated the consent form.

Taking cognisance of the COVID-19 protocols in the country at the time, the researcher conducted the individual face-to-face interviews in the English language on dates, times and places suitable to interviewees. The interview environments were safe and devoid of disturbances, and silence was secured to allow interviewees time to think before they responded to the questions. This enabled the interviewees to answer the questions honestly. The interviewees were probed where necessary to maintain the conversations consistently with the research objectives, whilst allowing participants to

express themselves freely without any interruption. All supplementary questions arising from the interviews were responded to by the interviewees with ease. Accordingly, the researcher was able to elicit the necessary information to answer the research questions. On average, each interview session lasted about 35 minutes. At the conclusion of every interview, the researcher expressed his gratitude to the interviewee for his or her goodwill. The first interview was conducted on 25 November 2020 and the last on 2 May 2021. The responses were recorded using an electronic audio recorder and were transcribed verbatim.

4.7.3 Field notes

In recent times, field notes have become an important element of rigorous qualitative research (Phillippi & Lauderdale 2018:381). Consequently, a number of qualitative researchers encourage field notes to be taken during interviews by researchers to improve research information and to obtain the full context for interpretation (see Creswell 2013:255; Mulhall 2003:310; Phillippi & Lauderdale 2018:383; Wolfinger 2002:92). Field notes are the documented evidence of the researcher's experience and what he or she has observed during the data collection process (Mulhall 2003:311). A comprehensive field note comprises observations of behaviours, verbal and nonverbal expressions of the participants, as well as a physical description of the setting of the interviews, key decisions that directed the data collection process, and the researcher's own reflections (see Creswell 2013:254; Phillippi & Lauderdale 2018:383). Throughout the research, notes were taken by the researcher on what he had heard, seen and experienced, in addition to his own personal reflections at the end of each day's activities. This journal was kept throughout the study period and was referred to when necessary.

4.8 PILOTING

Prior to the collection of data, the researcher carried out a pilot test to ensure the effectiveness of the instruments used to collect qualitative data (Gani, Rathakrishnan & Krishnasamy 2020:140). The researcher conducted a test interview with his supervisors on 29 October 2020 via Microsoft Teams. This took place after approval had been received from the Unisa CAS Research Ethics Review Committee for collection of data (refer to Appendix A). The four categories of interview schedules for

accounting academics, accounting graduates, employers, and government officials (refer to Appendix E) used for the data collection were tested. Based on the valuable ideas and suggestions offered by the supervisors, the interview questions were re-arranged. Questions that were not clear were rephrased to give a clear understanding to the interviewees in order to elicit good-quality information for the study. For the same reason, certain amendments were made to the questions in terms of language and structuring of sentences.

4.9 DATA MANAGEMENT

Data management is significant because it does not only guarantee the authenticity of the information but also keeps research participants from harm (see Lin 2009:132). Psychologically, participants may be negatively affected and might regret sharing their stories if the information they provided is divulged or not properly protected (Lin 2009:133). Consequently, the researcher must demonstrate to the participants that their data will be treated with respect and that privacy will be maintained. In qualitative research, data management is concerned with organising, categorising and storing of data to make it easily retrievable (Lin 2009:132). Data management requires the researcher to document how data was collected and analysed to certify that the information is presented in an understandable manner (Surkis & Read 2015:154). Appropriate data management permits the researcher to collect data in different settings for the purposes of different studies, and at the same time preserving the security of the data (Lin 2009:132).

In the current study, all hard copy documents received from the various organisations for the document analysis were kept under lock in the researcher's study. An audio-recorded folder of data from the in-depth interviews was created and saved on a password-protected backup drive. All data files were entered into the ATLAS.ti™ 9 coding programme to keep the data properly organised and managed. The personal computer of the researcher containing the electronic data was also password-protected and the data was only shared with the supervisors, the transcriber and the independent coder (who all signed confidentiality agreements), after it had been anonymised and de-identified. The field note data kept in the researcher's reflective journal was also kept under lock in his study. Data used for the current study will be

saved for five years after which it will be appropriately and permanently discarded. The next section describes the data analysis procedure.

4.10 DATA ANALYSIS

Analysing data organises it and facilitates understanding the data gathered to enhance synthesis, interpretation and communication in a research report (Polit & Hungler 2004:716). Data analysis involves numerous closely related procedures performed to summarise and organise the collected data in such a way that it will provide responses in terms of the research. Such a procedure is often messy, difficult and time-consuming, although it is an interesting and innovative method, according to Al Yahmady and Al Abri (2013:181). The current study followed thematic review procedures to analyse the data gathered. Thematic analysis was employed to identify, analyse and interpret important themes in qualitative datasets to address the research questions (Clarke & Braun 2017:297; Erlingsson & Brysiewicz 2017:95). Thematic analysis was used because of its flexibility and ability to enable the qualitative researcher to focus on the data in various ways (Clarke & Braun 2013:120). With thematic analysis, the researcher was able to focus on analysing meanings across the entire dataset and to examine the phenomenon under study in depth. Moreover, thematic analysis empowered the author to connect several opinions of research participants and to compare these with the data that had been collected.

Thematic analysis can be inductive or deductive (Alhojailan 2012:41). The **inductive** approach involves deriving meaning and creating themes from the data collected without any preconceived opinion. In other words, the researcher analysed the data without knowledge of which themes would emerge, and accordingly allowed themes to be determined by the data. In contrast to the inductive approach, **deductive** analysis involves analysing and evaluating the data according to pre-determined themes and categories. Generally, this approach is informed by previous knowledge and/or existing theory (Alhojailan 2012:41). The current study applied an inductive method to permit the data to speak for itself during the analysis, as explained by Alhojailan (2012:41).

The six steps proposed by Braun and Clarke (2006:92–99) were employed for analysing qualitative data, namely data familiarisation, coding, themes searching,

themes review, definition of themes, and writing up the findings of the study. The specifics of these steps are discussed in sub-sections 4.10.1– 4.10.6 below.

4.10.1 Familiarisation with research data

During this step, the author listened to the audio-recorded files of the participants to get a clear understanding of the content. After the transcriptions had been complete, the researcher read them very carefully while listening to the recordings to correct spelling mistakes and other errors. The interview transcripts were anonymised so that participants cannot be identified. The transcripts were double-checked to gain an understanding of the context of what participants had described. Interview transcripts were provided to some of the participants to garner their reactions and to confirm the quotations that were reported in the research. This member checking process also provided effective means for the researcher to ensure that participants' voices were accurately portrayed, thereby adding credibility to the study (Candela 2019:626).

4.10.2 Generating initial codes

Codes are denoted to units produced as a means of understanding and analysing research participants and their views in qualitative data (see Skjott Linneberg & Korsgaard 2019:267). The process of classifying and organising qualitative data to identify various themes and ways in which they are related, is called **coding** (see Nowell, Norris, White & Moules 2017:5). The process of coding establishes patterns in qualitative data, which assists with interpretation and theorising (Sutton & Austin 2015:228). **Independent coding** was adopted in the current study. This was in compliance with the ethics approval obtained from the CAS Research Ethics Review Committee. Independent coding is a systematic, qualitative way of coding performed by an experienced coder, working independently from the initial stages of the study and main data collection process (see Williamson, Van Rooyen, Shuttleworth, Binnekade & Scott 2020:1). The use of an experienced coder contributed in enhancing the researcher's understanding of qualitative data analysis. To verify the trustworthiness of the research analysis process with regard to the coding and categorising the data, an Independent Coder Certificate was obtained (refer to Appendix F).

→ **Coding cycles**

The independent coder followed the stages as outlined in this report in line with various scholars' views on coding in order to support the researcher (see Barbour 2001:1116; MacPhail, Khoza, Abler & Ranganathan 2016:201; Skjott Linneberg & Korsgaard 2019:264; Smith & McGannon 2018:117; Tracy 2019:220). Tracy (2019:220), in particular, emphasises the importance of researchers making sense of their data in collaboration with other people in the initial stages of data immersion. Consulting an independent coder may also be seen as integral to this sense-making. Furthermore, several scholars acknowledge the use of software to support coding (see Saldaña 2016:3; Skjott Linneberg & Korsgaard 2019:264; Sutton & Austin 2015:228). For this exercise, ATLAS.ti™ 9 was used. Using ATLAS.ti™ 9 enabled the researcher to list, organise and store all relevant data in a comprehensive and effective manner (Soratto, De Pires & Friese (2020:4). ATLAS.ti™ 9 also facilitated connections between codes, themes and categories, in addition to the creation of networks to indicate different linkages, differences and similarities (Ngalande & Mkwinda 2014:3). Notwithstanding the use of software, independent coding entails a mixture of cognitive and manual tasks and coding as processed by the software.

→ **Pre-coding**

The independent coder reviewed Chapter 1 and the conceptual framework, specifically the objectives of the study and the research approach and method. The main question and sub-questions were loaded into ATLAS.ti™ 9 as a memo. The independent coder also read the listed interviews as pre-coding to ascertain the sense of the participants' responses. With this cycle of pre-coding, extensive discussions were held with the researcher and his supervisors, and brief informal jottings were made to guide the formal cycles of coding.

→ **First-to-second cycles: Essential cycles**

Inductive coding was followed with the independent coder creating prefix codes to guide the strata of the sample and thereby to categorise the views of the different sample groups. In addition, the independent coder also coded per main research question and the four sub-questions.

Two cycles of coding were completed to review the data thoroughly. Because there were prefixes per stratum and per question, a high number of codes were generated for the research project. As many as 332 codes were refined as the final code list. The codes were then clustered into nine code groups (per stratum and then per main research question and the four sub-questions). The groups allowed the researcher to tie back the codes in a more linear and coherent fashion to the questions and, if there was a need to discern the views of the different sample groups, which was assumed to be important in the research, this was done with ease.

4.10.3 Searching for themes

At this stage, the researcher, in collaboration with the independent coder, started to sort the list of codes into themes. A theme comprises codes having a common reference point and a considerably high level of generality that combines ideas concerning the topic of inquiry (see Vaismoradi, Jones, Turunen & Snelgrove 2016:101). The researcher and the independent coder sorted and analysed the list of codes and their related extracts and then combined them based on the similarities identified to constitute the main themes. Others were grouped as categories according to Saldaña's (2016:14) model for qualitative data analysis (refer to Figure 4.4).

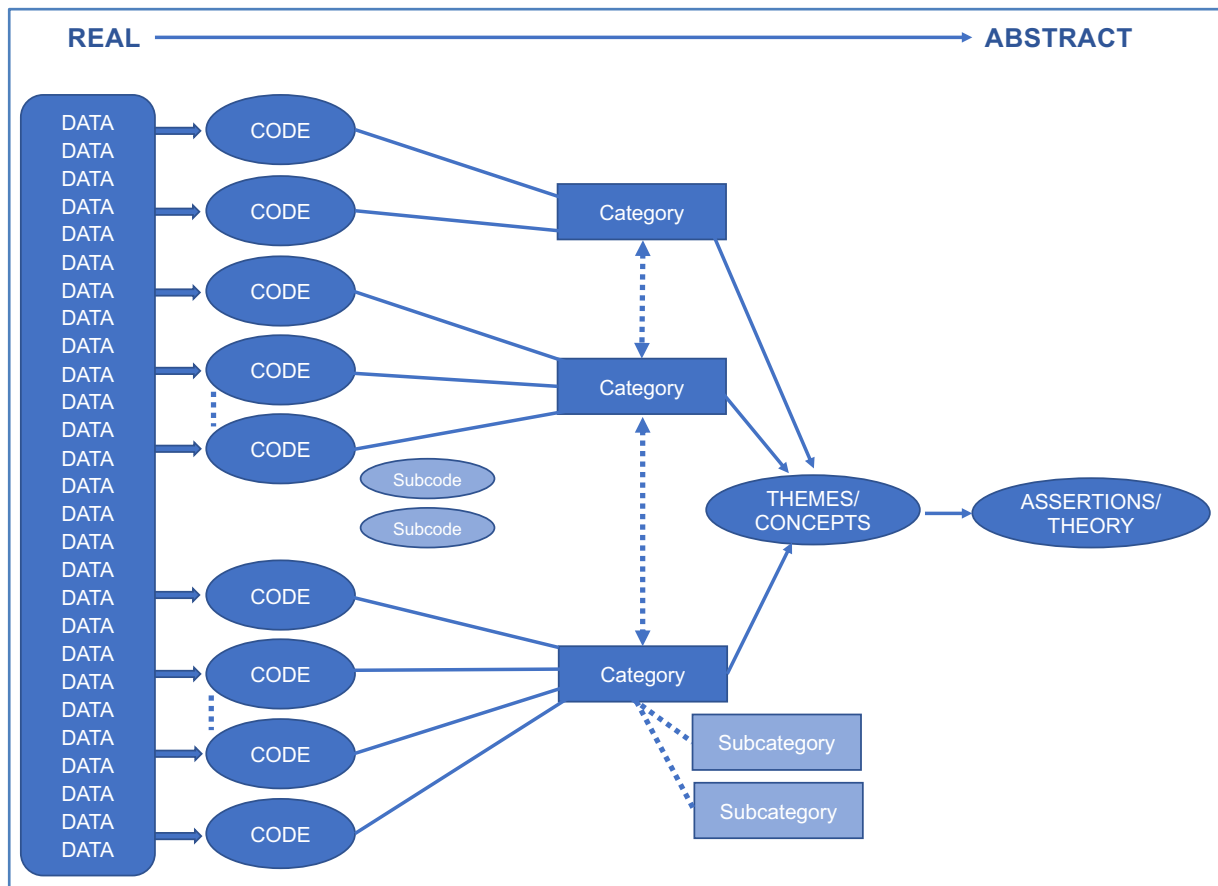


Figure 4.4: A conceptual codes-to-themes-to-theory model for qualitative data
 Source: Saldaña (2016:14).

Figure 4.4 depicts the process of classifying codes into categories and themes using ATLAS.ti™ 9.

4.10.4 Reviewing of relationships of themes and categories

During this stage, the researcher reviewed and refined the themes that had been identified during phase three. The researcher read through all the extracts associated with the codes to establish whether they supported the theme, whether there were contradictions, and also to check whether themes overlapped. Where there were contradictions within a theme or where it became too broad, the researcher divided the theme into separate themes or moved some of the codes into another theme where they fitted better. The main objective of this stage in the analysis was to make the themes more coherent and meaningful entities.

4.10.5 Defining and naming of themes

During this stage, the themes that had emerged were refined in relation to the particular data they conveyed and to the research objectives to provide answers to the research questions. This process required reviewing and re-examining the themes in relation to the entire dataset for coherence and relevance, as recommended by Braun and Clarke (2006:98). Three themes and eight categories that appeared to provide answers to the research questions were produced. These were reviewed repeatedly with respect to the dataset, codes, and research questions. The researcher held regular discussions with the independent coder as well as his supervisors, and suggestions resulted in the modification of the themes and categories in terms of numbers and/or names. The themes identified were used as a basis for further reasoning, discussions and the formulation of syntheses and the conclusion to the study, reflected in Chapters 5 and 6. The final themes, categories and related codes generated for the current study with their related theories are depicted in Table 5.3.

4.10.6 Writing up the findings of this study

This was the final stage of the data analysis process, which is discussed in Chapter 5. This stage involved writing up the findings of the current study. As suggested by Braun and Clarke (2006:98), repeated reading was done to select appropriate and convincing quotes from research participants to support the themes and the findings. The findings were related to existing literature relevant to the content of the themes generated to explain the employability challenges of accounting graduates in Ghana and to ensure a comprehensive understanding of the phenomenon under study by future readers. Next, the scientific rigour and trustworthiness of the current study are discussed.

4.11 SCIENTIFIC RIGOUR AND TRUSTWORTHINESS OF THE STUDY

Issues of scientific rigour and trustworthiness are critical considerations in determining the credibility of the findings of a study (see Cypress 2017:254). To ensure quality and trustworthiness for this study, the researcher applied the research instruments (see sub-sections 4.7.1 and 4.7.2) throughout the data collection process so that the findings and conclusions would conform to the research methods. The researcher also employed the five principles of credibility, dependability, transferability, confirmability

and authenticity proposed by Guba and Lincoln (1989:300) to address the issues of quality and trustworthiness in this study.

4.11.1 Credibility

Credibility is the extent to which the study signifies the real meanings of the research participants, or the “true value” (Morgan 2022:71). The current study ensured credibility through triangulation of data collection methods and sources (see Baxter & Jack 2008:556) or multiple sources of obtaining corroborating evidence (Onwuegbuzie & Leech 2007b:239; Yin 2013:322). Data was collected through document analysis and semi-structured interviews. The researcher concentrated on the procedure of selecting research participants and described how they were chosen (see Johnson & Rasulova 2016:15). There were regular debriefing sessions between the researcher and the supervisors throughout the various phases of data collection and data analysis to receive feedback. This ensured continued reflection and consideration of alternative views, which eventually contributed to the credibility of the research (Creswell & Creswell 2018:275).

4.11.2 Dependability

Dependability considers whether the findings of the study would be consistent if the study was replicated with the same participants or within similar contexts (Johnson & Rasulova 2017:269). The current study safeguarded dependability through triangulation to ensure that the limitations of one method of data collection were compensated by the utilisation of different data collection methods (see Shenton 2004:73). In addition, the research process was documented in detail to allow future researchers to repeat the work, although not necessarily to arrive at the same results (see Cypress 2017:258). This confirmed the accuracy of the findings and ensured they were supported by the data gathered.

4.11.3 Confirmability

Confirmability refers to the extent to which the findings of a particular study could be confirmed by other researchers (see Korstjens & Moser 2018:123). This gives evidence that the findings of a study are the result of the experiences and suggestions of the participants, rather than the views and preferences of the researcher (see

Korstjens & Moser 2018:121). In order to ensure confirmability and minimise the effect of researcher bias, triangulation was again used to ensure that the findings were based on the participants' experiences and views rather than on those of the researcher. The researcher's predispositions and beliefs were described and made clear early enough for all. Furthermore, the methodology was described in detail to enable readers to determine the extent of acceptance of the data and constructs emerging from it. Critical to this process was the 'audit trail'. This trail will enable any reader to trace the course of the study step by step through the decisions made and procedures described (Shenton 2004:72).

4.11.4 Transferability

Transferability describes the process of applying the findings of qualitative research in a particular situation to other, similar contexts or situations. The adequate and detailed description of a study would enable readers to have a good understanding of the case and determine how far they can be confident in transferring findings and conclusions presented to other situations (Alexander 2019:2). The researcher ensured transferability by providing a robust and detailed description of the study locations, the participants, data collection procedures and the context of the study to allow comparisons to be made (Shenton 2004:70).

4.11.5 Authenticity

The principle of authenticity considers the ability of a study to incorporate the values and constructions of research participants into the research in addition to empowering them to improve their situations (Johnson & Rasulova 2017:270). The authenticity criteria are fairness, ontological authenticity, educative authenticity, catalytic authenticity, and tactical authenticity (see Schwandt, Lincoln & Guba 2007:20). Each of the sub-criteria of authenticity and the procedures used to address them in the current study are briefly discussed in sub-sections 4.11.5.1– 4.11.5.5.

4.11.5.1 Fairness

Fairness describes the extent to which the views of different stakeholders are taken into consideration (Lincoln et al. 2011:180; Phillips, Dwan, Hepworth, Pearce & Hall 2014:10). The researcher interviewed four different groups of study participants,

comprising government officials, accounting academics, employers, and newly employed accounting graduates using a different detailed interview schedule for each category of participants. All participants were given the chance to voice their opinions on different aspects of the issue under investigation (Amin et al. 2020:9). In addition, the researcher solicited the perspectives of all participants and engaged in open discussions with them about recommendations and future actions to be taken.

4.11.5.2 *Ontological authenticity*

Ontological authenticity refers to the degree to which research participants understand their situation as a result of participating in the research (Johnson & Rasulova 2016:13). The researcher analysed statements provided by research participants. He left audit trails that documented participants' increase in consciousness and their understanding of the world.

4.11.5.3 *Educative authenticity*

This type of authenticity refers to the extent to which individual participants have improved their understanding of, appreciation for, and tolerance of the constructs of others outside their own stake-holding group (Johnson & Rasulova 2016:27). In ensuring educative authenticity there was comparison of the assessments by participant and the researcher of the constructs held, statements about their understandings of others' constructs and maintenance of an audit trail (Johnson & Rasulova 2016:28).

4.11.5.4 *Catalytic authenticity*

Catalytic authenticity is the degree to which actions are stimulated and facilitated by the research being carried out (Collins, Onwuegbuzie, Johnson & Frels 2013:275). To ensure catalytic authenticity, the researcher obtained statements from all participants concerning their interest in and readiness to translate their increased understanding into action (Collins et al. 2013:275).

4.11.5.5 *Tactical authenticity*

Tactical authenticity is the extent to which stakeholders are empowered to take the actions implied or suggested by the research results (Amin et al. 2020:9; Johnson &

Rasulova 2016:13). Participants asked the researcher to publish this work to raise awareness of the research findings, which might be helpful in formulating a dissemination strategy. In striving towards tactical authenticity, the researcher ensured confidentiality, negotiated the type of data that was collected, as well as the way this data was interpreted and reported. The researcher used detailed and clear consent forms, and the researcher and participants jointly assessed the degree of empowerment that may evolve throughout the research (Amin et al. 2020:13).

4.12 ETHICAL CONSIDERATIONS

Research ethics refers to the specific principles that guide the researcher to conduct and publish research findings without any participant of the study being harmed (Anwar 2015:23). Research ethics is particularly concerned with the analysis of ethical concerns, which are frequently expressed when persons are involved as participants in research (Akaranga & Majid 2016:5). According to Palaskar (2018:1), adherence to ethics aims to achieve three objectives in research:

- protecting human participants;
- ensuring that the research is conducted in a manner that serves the interests of individual participants, groups and/or the entire society; and
- examining particular research work for ethical reliability.

In conducting the current study, the researcher adhered to various ethical principles. The researcher obtained approval from the Ethics Review Committee of the CAS at Unisa and obtained permission from the individual participants as well as the employers of research participants, where applicable. The researcher also ensured that transcripts and notes were kept safely during the process of collecting data.

Further, ethical concerns with reference to research participants' rights, anonymity and confidentiality as well as plagiarism are described in the paragraphs below:

- **Informed consent and voluntary participation**

To enable the participants to give informed consent, the researcher explained to them the purpose, approaches, the overall importance of the research as well as the benefits and risks involved in participating in the current study (Halej 2017:3). Participation in the study was further voluntary, and participants had

the right to withdraw at any time during the project without giving reasons for declining to participate and without any victimisation (Halej 2017:4).

- **Anonymity, confidentiality and privacy**

As recommended by Akaranga and Majid (2016:6), care was taken to protect the privacy of research participants by not finding out about their cultural backgrounds, mentioning their names, or revealing any further sensitive information concerning participants. This enhanced trustworthiness and at the same time protected the participants from emotional trauma.

- **Integrity and transparency**

The researcher ensured that each phase of the design of research and collection of data, cleaning, coding and analysis was documented to maintain the audit trail and to ensure the transparency of the research process (Halej 2017:4). This process did not only facilitate the interpretation of the data based on open-mindedness, but also ensured that the results were based on the data and not on what the researcher expected to find.

- **Plagiarism**

In the current study, the researcher ensured that all the written work was original. As suggested by various studies (see Akaranga & Majid 2016:6; Hofstee 2009:211–21; Kour 2014:134), all the sources used or quoted have been indicated and acknowledged by means of complete references.

4.13 CHAPTER SUMMARY

This chapter presented the methodology used to conduct the current study, which sought to examine the ICT and HOT skills accounting graduates in Ghana should possess upon completion of the accounting programme to enhance their employability. The chapter detailed the rationale for the choice of pragmatism as the qualitative research paradigm, using a DBR methodology. The research participants, data collection methods, data management and analysis procedures were also described. Finally, a section was provided to describe how the scientific rigour and trustworthiness

of the qualitative data were ensured in addition to the ethical issues of the current study.

The next chapter presents the thematic findings of the current study integrated with findings from the document analysis and existing literature. The findings were used to evaluate and amend the original conceptual framework to constitute the final conceptual framework. The researcher's reflective journal capturing his experiences relating to the data collection stage of the research will also be discussed.

CHAPTER 5

RESEARCH FINDINGS AND DATA ANALYSIS

5.1 INTRODUCTION

In the previous chapter, the research design and methodology for the current study were comprehensively described. As specified in section 4.5, a total of 30 participants from the database of accounting academics, accounting graduates, employers and government officials were interviewed to explore their views and/or experiences of the employability challenges of accounting graduates in Ghana. The interviews, which followed a face-to-face, semi-structured format were transcribed and coded based on the research questions.

This chapter presents the results obtained from the analysis of the data. First of all, the findings from the documents analysed for the purpose of the current study are presented. Secondly, the researcher describes the socio-demographic information of the research participants. This is followed by the themes, categories and related codes that emerged from the interview data gathered for the purpose of answering the research questions. The findings under the categories and their related codes generated by ATLAS.ti™ 9 are explained with appropriate and convincing direct quotes from the interviews. The feedback from the participants is further corroborated with findings from the document analysis and literature relating to the content of the themes generated in addition to the researcher's interpretations and reflections using the field notes. The quotes used are presented in inverted commas. A visual presentation of the layout and structure of Chapter 5 is provided in Figure 5.1.

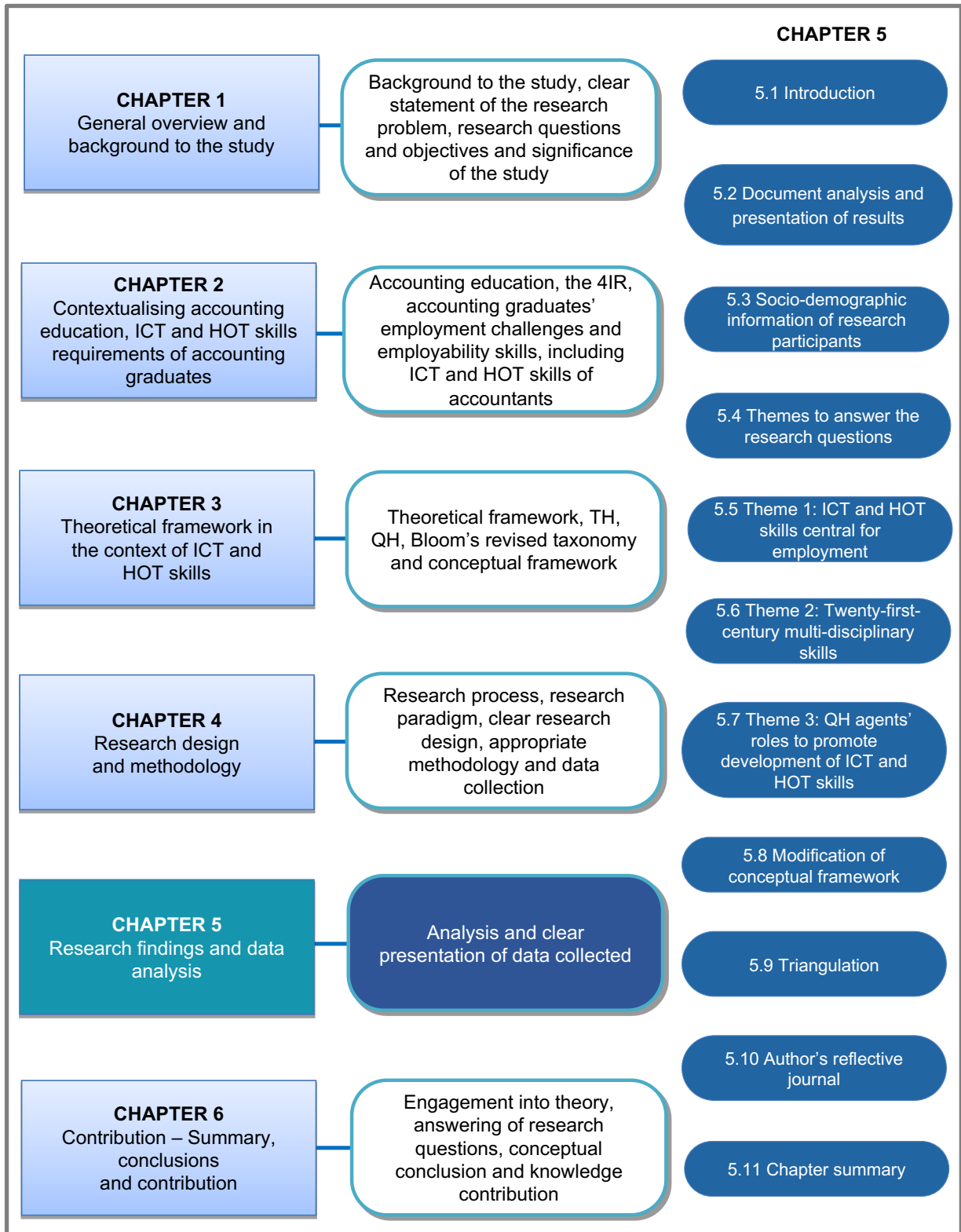


Figure 5.1: Structure of Chapter 5

Source: Author's own compilation.

5.2 DOCUMENT ANALYSIS AND PRESENTATION OF RESULTS

As stated in section 4.7.1, the undergraduate accounting curriculum of the five selected public universities, the Education Strategic Plan (Ministry of Education 2018), the ICT in Education Policy (Ministry of Education 2015) and National Employment Policy (Ministry of Employment and Labour Relations 2014) were analysed to generate data relevant for the current study. A table showing these documents, the aims and the key focus areas of these documents was prepared to guide the analysis (refer to Appendix G). Table 5.1 below provides the findings from the analysis of these documents.

Table 5.1: Results of document analysis

Document type	Key focus	Findings
Undergraduate accounting degree curriculum	Types of accounting degrees offered, the duration of the programme and the total credit hours required to graduate	Apart from U4*, which offers a Bachelor of Commerce (BCom) degree, all the other universities offer a Bachelor of Science (BSc) degree in Accounting. The duration of the degrees is four years. A student is required to collect a minimum total of 135, 129, 138, 139 and 138 credits to graduate from U1, U2, U3, U4 and U5 respectively. * U1, U2, U3, U4 and U5 are abbreviations for university 1–5.
	Accounting and other business-related courses offered by all the universities	Financial accounting; cost and management accounting; public sector accounting; auditing; taxation; financial management; management; economics; marketing; business law; quantitative methods, business ethics and entrepreneurship
	ICT courses and the level of studies that are offered by the universities	All the universities offer a 6-credits introduction to an IT or computing course mainly at level 100**. In addition, U1, U2, U4 and U5 offer a 3-credits course in computerised accounting. In place of computerised accounting, U3 offers a 3-credits management information system course. These courses are offered at either level 300 or 400. ** Level 100 is the first year of study at the university.
	HOT-related courses and the level of studies that they are offered by the universities	U1, U2 and U4 offer a 3-credits course in logic and critical thinking. U5 offers a 3-credits course in introduction to psychology instead of the critical thinking course. These courses are offered either at level 100 or 200. No HOT-related course has been identified in the course structure of U3.
	Methods of assessment and academic activities required of students	The main methods of assessment used by the universities are assignments, interim and end-of-semester examinations. To qualify for these assessments, a student must attend all lectures, tutorials, seminars and practical work.

Document type	Key focus	Findings
Education Strategic Plan 2018–2030	<ul style="list-style-type: none"> Strategies to strengthen the capacity of universities to provide high-quality research and training Provision of laboratories, lecture halls and ICT requirements The supervisory bodies of public universities and the effectiveness of their roles 	<ul style="list-style-type: none"> Government has strategies to provide financial supports, including provision of buildings and ICT infrastructure to the public universities, especially the older ones These supports are not standardised, they are specific to the needs of the universities Government has plans to provide loan support to tertiary students through the Student Loan Trust Fund (see Ministry of Education 2018:55) Limited legal and capacity authority (NAB and NTCE [now GTEC]) to serve as supervisory entities of the universities (see Ministry of Education 2018:55)
ICT in Education Policy	<ul style="list-style-type: none"> Provision of ICT infrastructure, such as hardware, software and connectivity Strategies to achieve the goal of the ICT in education 	<ul style="list-style-type: none"> Government provided ICT services at all levels of education Provided an enabling environment for integration of ICT within the educational system and capacity building of lecturers (see Ministry of Education 2015:20)
National Employment Policy	Strategies to create employment for accounting graduates	<p>The policy specifies some major interventions targeted at specific groups:</p> <ul style="list-style-type: none"> tertiary education graduates, e.g. NABCO – established in 2018 to provide temporal employment for 100 000 fresh graduates in various fields; targeted at the youth in general in various fields, e.g. education, security, health, agriculture, etc.; and criteria for job placement are general for all youth and graduates. No specifics for graduates in specific fields, such as accounting (see Ministry of Employment and Labour Relations 2014:20).

Source: Author's own compilation.

Table 5.1 above shows the plans for effective teaching and learning, especially at tertiary level, and employment creation as per the documents reviewed. However, the interviewees indicated various challenges and contradictions to the intended actions and strategies for ensuring quality education and employment creation for graduates as envisaged in these documents. As part of the reiterative process of DBR, the findings of the document analysis were incorporated where applicable under the themes in sections 5.5–5.7.

The current study aimed to examine the ICT and HOT skills accounting graduates in Ghana should possess upon completion of the accounting programme to enhance their employability. The research questions listed below were critical for evaluating the conceptual framework.

RQ1: Should public universities in Ghana introduce new ICT and HOT skills in the curriculum of accounting degrees?

RQ2: Which ICT and HOT skills do accounting graduates in Ghana need for their career?

RQ3: Which roles will government, academics, employers and graduates play in the development of ICT and HOT skills of accounting graduates in Ghana?

RQ4: How will government, academics, employers and graduates collaborate to promote the development of ICT and HOT skills of accounting graduates in Ghana?

The research participants, namely accounting academics, accounting graduates, employers and government officials were chosen using purposive and snowball sampling methods to address the research questions. The interviews, which were semi-structured, were carried out during the prototype or development phase of the DBR (refer to Figure 4.2).

5.3 SOCIO-DEMOGRAPHIC INFORMATION OF RESEARCH PARTICIPANTS

Table 5.2 presents the socio-demographic details of the research participants. To maintain anonymity and confidentiality, the participants were given pseudonyms in place of their real identities:

- academic staff members from university 1 are presented as AS1U1;

- graduates from university 1 are presented as GRAD1U1;
- EMP represents employers; and
- GOV represents government officials.

Table 5.2 shows information about:

- QH agent category;
- educational qualifications;
- positions held; and
- the number of years served in the organisation at the time of conducting the interviews.

In Table 5.2, it is shown that apart from the academic qualifications, a considerable number of the employers, academics and graduate participants had professional accounting qualifications. It can also be seen that they had significant academic and professional working experience. The academic staff had 4 to 21 years of working experience, whereas the employers and government participants had 3 to 15 years' and 4 to 10 years' working experience respectively. The graduates also fell within the three years' working experience range required for the current study.

Table 5.2: Socio-demographic information of research participants

Pseudonyms	Qualification	Position	Number of years in position
AS1U1	PhD (Accounting)	Lecturer	7
AS2U1	PhD (Accounting); CA(G)	Senior lecturer	9
AS1U2	MPhil (Accounting)	Senior lecturer	9
AS2U2	MPhil (Accounting); CA(G)	Senior lecturer	10
AS1U3	MA; member of ACCA, CIMA	Lecturer	8
AS2U3	MBA (Accounting)	Senior lecturer	21
AS1U4	MBA (Accounting); member of ACCA	Lecturer	9
AS2U4	PhD (Accounting); CA(G)	Senior lecturer	11
AS1U5	PhD (Accounting); member of ACCA.	Associate professor	15
AS2U5	PhD (Accounting)	Lecturer	4
GRAD1U1	BSc (Accounting); CA(G)	Senior accounting assistant	2
GRAD2U1	BSc (Accounting)	Assistant finance officer	2
GRAD1U2	BSc (Accounting)	Senior audit assistant	2
GRAD2U2	BSc (Accounting); CA(G)	Senior audit assistant	2
GRAD1U3	BSc (Accounting)	Audit trainee	3
GRAD2U3	BSc (Accounting)	Accounts officer	3
GRAD1U4	BCom	Assistant accounts officer	2
GRAD2U4	BCom	Accounts officer	3
GRAD1U5	BSc (Accounting)	Senior accounting assistant	2
GRAD2U5	BSc (Accounting); CA(G)	Assistant internal auditor	3
EMP1	BSc (Accounting); member of ACCA	Senior associate	5
EMP2	MBA (Human Resource)	Manager: performance team	10
EMP3	Doctor of Commerce; CA(G)	Deputy controller	15
EMP4	MBA (Finance); CA(G)	Senior partner	3
EMP5	MSc (Finance); CA(G)	Senior audit associate	5
EMP6	PhD (Development Finance)	Executive director	7
EMP7	MBA (Accounting); CA(G)	Finance director	3
GOV1	PhD (Management Science)	Coordinator of universities	4
GOV2	MBA (Economics Policy)	In charge of public universities	7
GOV3	MSc (Policy and Planning)	Head of quality assurance department	10

Source: Author's own compilation.

5.4 THEMES TO ANSWER THE RESEARCH QUESTIONS

Through a thematic coding process and summarising of the codes that had emerged, themes and categories were developed to answer the research questions (refer to section 4.10). Table 5.3 presents a holistic view of the structure of the themes, categories and related codes that emerged from the data analysis. Each of the themes shown in Table 5.3 is discussed in detail in sections 5.5–5.7.

Table 5.3: Structure of data themes, categories and related theories

RELATED CODES	CATEGORIES	THEMES	THEORY
Balance of practical and theoretical skills	Substantive changes in the curriculum	ICT and HOT skills central for employability (refer section 5.5)	Bloom's revised taxonomy
Full spectrum of financial and management accounting knowledge			
Blend of academic and professional qualifications			
Sound ethical requirements and integrity			
Inadequate use of technology	Intensive ICT and HOT environment		
ICT infrastructure concerns			
Microsoft computer and accounting software packages	Computer application packages and soft skills	Twenty-first-century multi-disciplinary skills (refer section 5.6)	
HOT skills			
Interpersonal skills			
Entrepreneurship and innovative skills			
Policy formulation and regulation	Individual roles of government	Roles to promote development of ICT and HOT skills (refer section 5.7)	QH innovative model
Accreditation and quality assurance of programmes			
Provide resources for improved graduateness and employability or self-employment			
Create an enabling environment for doing business			
Conduct research	Individual roles of academics		
Foster graduateness			
Practical exposure of students to 4IR technologies			
Undertake and disseminate evidence from tracer studies			
Developing industrial practicum			
Fulfil their role of being employers and supporting the uptake of graduates into the active economy	Individual roles of employers		

RELATED CODES	CATEGORIES	THEMES	THEORY
Assist with effective work readiness programmes			
Support through investment and corporate social responsibility (CSR)			
Ongoing learning and skills development	Individual roles of accounting graduates		
Volunteerism and networking			
Development of the acumen to be self-starters and entrepreneurs			
Co-creators of relevant accounting curriculum	Collaborative roles		
Facilitating work-readiness of accounting graduates			
Public-private partnership (PPP) business establishments and supports			

Source: Author's own compilation.

5.5 THEME 1: ICT AND HOT SKILLS CENTRAL FOR EMPLOYABILITY

The theme, "ICT and HOT skills central for employability" entails two categories, namely substantive changes in curriculum needed, and intensive ICT and HOT environment for skills development. Table 5.4 presents each of these categories in addition to their related codes that emanated from the ATLAS.ti™ 9 grouping. Please note that all responses by participants are reproduced verbatim and unedited.

Table 5.4: ICT and HOT skills central for employability

RELATED CODES	CATEGORIES	THEMES	THEORY
Balance of practical and theoretical skills	Substantive changes in the curriculum	ICT and HOT skills central for employability	Bloom's revised taxonomy
Full spectrum of financial and management accounting knowledge			
Blend of academic and professional qualifications			
Sound ethical requirements and integrity			
Inadequate use of technology	Intensive ICT and HOT environment		
ICT infrastructure concerns			

Source: Author's own compilation

In response to the question whether accounting graduates in Ghana currently face employment challenges, all the participants answered in the affirmative. However, some participants pointed out that the unemployment situation does not apply to accounting graduates only but also to all graduates, especially those in the developing countries (AS2U2, AS1U4, EMP4, GOV2). The employment challenge among the accounting graduates is mainly the result of them not having the ICT and HOT skills mostly required by employers in this era of information technology (EMP1). Apart from a lack of particular ICT skills, “employers were seeking about four to five years of practical work experience”, which most of the newly graduated students did not possess (GRAD1U1). In all the interviews that graduates attended, “employers demanded critical thinking skills, the ability to solve problems and to bring something new; new ideas into the institution to enhance profitability” (GRAD1U2).

Some of the employer participants emphasised the importance of ICT skills for their accounting staff and explained:

“Yes, we expect the accounting graduates that we employ to have some basic ICT knowledge from the start so that since they are already familiar with that area, it will not be difficult to train them and get them into the workings of the systems” (EMP2).

“When we are interviewing the graduates for employment into the institution, we test them for their analytical ability and their general intelligence through their delivery; the way they answer the questions and their presentations is very critical to us” (EMP3).

The acquisition of ICT and HOT skills by the accounting graduates was seen by a graduate participant as “a necessity for the performance of accounting tasks because as the world is developing and businesses are also evolving, the use of computers and critical thinking are becoming the order of the day” (GRAD1U1).

The following statement by an employer participant provides the reason for employers’ demand for ICT and HOT skills:

“Not many employers will be willing and ready to train accountants on how to use ICT tools because that will increase their operational costs. So, the accounting curriculum of universities should be redesigned in such a manner that by the time the students come out of the universities, they will be well equipped with computer

knowledge and the HOT skills that are very much required in the employment market” (EMP5).

Accordingly, a graduate participant, who had experienced hopelessness and despair before getting employment, advised:

“Because we are in the world of technology, if any graduate, especially an accounting graduate is not abreast with ICT and HOT skills, it will be very difficult for him or her to get a job” (GRAD1U4).

The views of the participants and the literature are in agreement that accounting graduates are struggling to secure employment mainly because they do not have the relevant ICT and HOT skills, which are required in the workplace (IFC 2019:44; IYF 2013:11). As highlighted in the literature, with the unprecedented pace of technological development, employers expect accounting graduates not only to learn and generate accounting information, but also to acquire several skills, such as 4IR ICT and HOT skills (Chalkiadaki 2018:10; Dunbar et al. 2016:70; Zureigat 2015:234). Therefore, substantive changes in the accounting curriculum are needed to address the ICT and HOT skills requirements of accounting graduates in Ghana to enhance their employment as discussed in section 5.5.1.

5.5.1 Substantive changes in the accounting curriculum

Based on the employment challenges faced by accounting graduates, the interviewees suggested substantive changes in the accounting curriculum to equip upcoming accounting graduates adequately for the ever-changing world of work. An academic staff member stated, “we are several years behind compared to other universities in the developed countries, and we need to hurry up to catch up” (AS1U3). Globally, studies established that the university accounting curriculum needs a massive overhaul to equip graduates with the relevant skills for the competitive employment market (Ackerman 2019:2; Alshare & Sewailem 2018:19; Dawkins 2020:5). Based on the coded data, the changes must focus on:

- balancing practical and theoretical skills;
- providing a full spectrum of financial and management accounting knowledge;
- blending of academic and professional qualifications; and
- ensuring sound ethical requirements and integrity in the accounting curriculum of public universities in Ghana (refer to Table 5.4) (also see Dawkins 2020:7).

The related codes are discussed in detail in sections 5.5.1.1–5.5.1.4.

5.5.1.1 *Balance of practical and theoretical skills*

Participants expressed much dissatisfaction about the accounting curricula of the universities due to its theoretical nature as a result of which it is not able to satisfy the needs of employers. In the opinion of one employer participant, “the graduates are fine with the theory, but with the practical aspect, they are lacking” (EMP2). Another employer participant added, “the graduates have the theoretical background, what is required is to expose them to the practical aspects of processing accounting transactions so that they can properly do the work that is required of them in the industry” (EMP7). In the opinion of another employer participant, “we should let the students have more hands-on experience of the things that they learn” (EMP2). Participants further suggested, “a massive change in the accounting curriculum to teach what is relevant practically” (EMP1). Supporting the need to modify the current accounting curricula of the universities to meet the practical skills requirements of employers, an academic staff participant remarked, “we do not have to be producing robots where students are awarded only for remembering what the teacher has said” (AMP1U3).

The graduate participants held similar views as the employers about the theoretical nature of the university accounting curriculum. For instance, one graduate participant stated:

“The courses that we studied were too theoretical and examination focused, we could not actually understand how we can apply this knowledge at the place of work and now, it has become a challenge to some of us” (GRAD1U3).

Another graduate interviewee acknowledged that accounting students are taught the theory of accounting and the ICT separately but not how to use the computer to prepare financial reports practically or how to develop programmes (GRAD1U4). Consequently, the participants were of the view that accounting should be taught in such a way that it will help in producing competent accounting graduates for the world of work. Similarly, other accounting staff interviewees recommended, “accounting should not be taught as a course, but as it happens in business or in practice” (AS1U3), and “it should be more challenging for the students because they are used to just opening a book, look for the information they want and then just reproduce it” (AS1U4).

Government participants also required accounting academics to have industry experience to practically explain the theories to the understanding of the students (GOV1). Paradoxically, it was evident that some of the academic staff participants had industry experience and were aware of the current trends in the industry, but they were unable to practically demonstrate such experiences in their teaching. An academic staff stated, “we are still doing everything in the setting where it is not practical” (AS1U4). A gap therefore remains between what academics do and what happens in the industries due to the lack of practicability. Consequently, it has been suggested that the accreditation and quality assurance body should ensure that the teaching and examinations of accounting courses should be “hands-on and not the normal paper-based examination type so that our future accountants will become very competitive” (EMP7).

The analysis of the accounting course structures of the universities revealed that the lectures, presentations and discussion methods constitute the dominant modes of delivery in the courses. An employer interviewee believed that these methods are not effectively employed during teaching and learning processes to produce practical results (EMP6). As a result, an employee participant suggested, “lectures should work more with case studies to make teaching of accounting more practical at each stage of the training” (EMP6). Moreover, the use of case studies may result in students displaying HOT skills during the learning process. EMP6 elaborated:

“The students should be hands-on trained. And we should use the software to train them. Not only the situation where the lecturer goes to the classroom and use the computer for PowerPoint presentations.”

In response to the call to enhance the accounting curriculum contents to cater for the hands-on and practical components, a government interviewee pointed out that this has started already in some of the public universities (GOV3). The interviewee further explained:

“If you looked at the policies of some universities now, the practical aspect is about 70% of the end of semester assessment and the theory is about 30%. In the past, it was about 70/30 theory to practical, the other way round, and that shows how much emphasis that we are putting on the practical aspect of training the students” (GOV3).

It should be noted that the review of the accounting curriculum of the participating universities (refer to Appendix G and Table 5.1) did not reveal any information about which percentages of the end of semester assessments are assigned to theory and which to practical work. It could be that, at the time of this study, this policy was yet to be formally incorporated into the accounting curriculum of the participating universities.

5.5.1.2 Full spectrum of financial and management accounting knowledge

The document analysis of the course structure (accounting curricula) of the participating universities (refer to Table 5.1) indicated that financial accounting, cost and management accounting, public sector accounting, taxation, auditing and other accounting-related courses form the major components of the accounting curricula of selected universities. These courses, especially financial accounting, is spread over and taught at all levels of study with different levels of difficulties and emphasis. At the time of this study, it was expected that the study of these courses would equip graduates to develop adequate skills and knowledge in accounting and management to support industrial and socio-economic development (Low, Samkin & Liu 2013:1; Musov 2017:434).

The above notwithstanding, it appeared that participants were not satisfied with the financial and management accounting knowledge and skills being imparted by the universities, as a result of which they advocated for the curricula that would improve on the contents and delivery of these courses. According to one graduate participant:

“I think the financial reporting courses can be further looked at where more emphasis will be placed on the learning of the International Financial Reporting Standards [IFRS] for the graduates to apply it more when they finally get accounting jobs” (GRAD1U1).

In support of GRAD1U1, an employer participant stated:

“In terms of technical skills, I will say knowledge in IFRS is very limited. Most people do not even know much about them, you have to know how they can be applied within the context of business transactions. Maybe not in to details because the accounting standards can always be refer to” (EMP1).

An academic staff participant also emphasised the fact that:

“The standards are what they have to draw on when they are doing their work. Technical proficiency is very important. They should have the accounting

standards at their fingertips so that anytime that they are asked to deal with a transaction, they will know which standard to refer to” (AS1U1).

Participants further commented:

“An accounting graduate should be able to prepare final accounts regularly and on timely bases, analyse financial data and make predictions when it comes to operational and management budgeting. In addition, they should be trained to help the board of directors to be more transparent as far as dissemination of information is concerned. They should know which information must be circulated, at what time, to which category of people, and which information must be kept because of competition in the work environment” (EMP6).

“Again, the universities have to re-orient their accounting programmes for the graduates to be able to do proper valuation of intangible assets because the credibility of goodwill is becoming an important accounting issue these days” (EMP6).

The above comments of the participants clearly show that the financial and management accounting courses being offered at universities need enhancements. This will require accounting academics collaborating with employers and other major stakeholders in the accounting field to determine the contents and methods of delivering these courses. This will ensure that future accounting graduates are well equipped to meet the financial reporting needs of employers and other stakeholders for the purpose of making informed decisions.

Section 5.5.1.3 discusses the need for accounting graduates to obtain both academic and professional qualifications to enhance their employability.

5.5.1.3 *Blend of academic and professional qualifications*

Based on the data collected, it was evident that employers prefer accounting graduates with professional accounting qualifications in addition to the academic qualifications to those with only academic certificates when recruiting accounting personnel. As a result, it was argued that it is difficult for accounting graduates without a professional accounting qualification to get employment. Those who were lucky to secure a job with just an accounting degree without professional qualifications “are given lesser

responsibilities compared to somebody with a professional qualification” (AS2U5).

Some of the participants lamented:

“Apart from the first degree, some employers were demanding professional accounting qualification such as Association of Chartered Certified Accountants [ACCA], Chartered Accountants, Ghana [CAG], Chartered Financial Analyst [CFA], or Chartered Institute of Management Accountants [CIMA], which as a fresh accounting graduate, I did not have” (GRAD2U3).

“Yes, I face some challenges because I did not have much experience in the accounting industry as well as being a member of a professional body” (GRAD1U2).

From the responses by the research participants, the reasons mentioned below justified the employers’ preference for accounting graduates with both academic and professional qualifications for employment compared to those with only academic qualifications.

“There is the perception countrywide that education standards are falling and I think that is what influences the minds of employers to be actually more interested in those with the professional qualification than those with just an academic qualification” (AS2U5).

“Because the focus of the degree programmes is the concepts but that of the professional is to prepare the graduates for the actual work in the industry” (EMP7).

“Because every organisation wants to save cost and maximise profit, so employers would not want to have a non-performing staff or somebody who is not professionally qualified among the team” (EMP1).

Prior studies ascribed employers’ preference to graduates with professional qualifications to the deemed hands-on expertise they provide, the international nature and the constant reviews of the syllabi of the professional bodies to respond to the requirements of businesses and the accounting profession as a whole (Abdulrahamon, Toyin Adeleye & Adeola 2018:33; Asonitou 2017:7).

On the other hand, one of the academic participants considered the demand for a professional accounting qualification from the accounting graduates as “a missing gap” and argued:

“Our job at this level of education is to train their mind and give them the requisite knowledge so that when they get to the job market, regardless of the environment they find themselves in, they can function with in-house training. I do not expect my accounting graduates to start practicing immediately as professional accountants. After school, if they want to practice as accountants, they must have their professional qualifications and get their license to do so” (AS2U1).

On a similar note, a government participant pointed out that, without a professional accounting certificate, it should be possible for graduates to perform well on the job because a typical university accounting programme has an “in-built component of the professional and practical dimension” that prepares graduates well for the job market (GOV3).

In order to resolve this academic and professional qualification controversy concerning accounting graduates once and for all –

“[T]here should be more synchronisation of what is done for an accounting academic degree and professional education to a large extent, not to put them in silos to let it look like a professional qualification is so different from the academic qualification” (AS2U5).

The professional accounting bodies should collaborate with public universities in raising accountants by way of incorporating their curricula into that of the public universities offering accounting (GOV2). This statement supports the view of Ackerman (2019:2) that the professional accounting courses and mode of examination need to be integrated into the accounting curricula of universities so that when students graduate, they have already acquired the professional qualification and will not struggle to pass the professional examination outside of the university. This will help to fill the accounting skills gaps, which are seen as not properly fixed by the academic institutions, so that accounting students in Ghana will be able to graduate as professional accountants in addition to their BSc or master’s degree in accounting.

5.5.1.4 Ethical requirements and integrity

To ensure sustainable employment of accounting graduates, participants emphasised a curriculum that would train students to exhibit sound ethical characteristics and integrity. One of the employer interviewees stated, “in the accounting profession, it is a matter of integrity and without integrity you are not an accountant” (EMP6).

Ethics refers to the standards of behaviour that define the way we act and relate to one another (see Tazuddin 2020:428). Integrity is beyond ethics at a personal level; it is mostly about someone's character. It is characteristics such as constant understanding and being compassionate, honest, transparent and ethical (Duggar 2009:2). Duggar (2009:6) further notes that people with integrity earn trust in their associations with other people, they are respected, and relied on to act in good faith.

Because of the importance and sensitivity of organisations' financial statements many of them are currently reinforcing strong principles of ethics and integrity as an indispensable part of the functions of accountants and auditors in preparing financial reports (Jaijairam 2018:2). In response to the question, "which other skills and attributes do you want to be emphasised in the accounting curriculum?" the research participants expected accounting graduates to show ethical commitments and integrity because "everybody is afraid of people who do not have conscience so that when they are employed, they would not come and defraud the organisation" (AS2U2).

The document analysis of the curricula of the universities also indicated that all of them offered a 3-credits business ethics course where students are exposed to ethical issues and their applications at personal, organisational and societal level. The major topics that are covered in this course are basic ethical theory dealing with bribery and corruption, values in a business society, societal implications of business policies and corporate social responsibility (CSR). However, participants indicated that this course is not enough to instil ethical behaviour in graduates. An employer interviewee stated:

"There are a lot of them, including those who are pursuing the professional accounting programmes with attitudinal and ethical problems. They need to humble themselves and apply the ethical principles that they acquired at the university to be able to add value to their organisations" (EMP1).

5.5.2 Intensive ICT and HOT environment

Interviewees' responses to the question "What do you think is the best way of equipping accounting graduates for effective performance of accounting tasks in the wake of the 4IR?" revealed that public universities in Ghana "must be encouraged to operate more in ICT and HOT environments" (EMP2) because "technology is fast eating into business and professional practices to the extent that things we needed to do manually are being done by the computer" (EMP7). To explain this issue further,

Table 5.4 indicates the codes relating to this category based on the coded data, namely inadequate use of technology and ICT infrastructure concerns for effective teaching and learning of ICT skills. These codes are described in detail in sections 5.5.2.1 and 5.5.2.2 using the direct quotes from the interviews in addition to the findings obtained from the document analysis and literature.

5.5.2.1 *Inadequate use of technology*

Technology has ended up being an integral part of everyday life as a result of which several countries are taking practical steps to ensure that the essential technological concepts and skills constitute a fundamental part of education at all levels (Ainoo 2020:2; Buabeng-Andoh & Issifu 2015:1282). According to Segredo, Miranda and León (2017:34), in a technology-oriented society, it is inadequate to be a user of technology; we must also be active creators. Evidence from the interview data indicated inadequate technology use in public universities in Ghana. Therefore, there is the need for students, especially at this level of education, to be trained and be conversant with the use of modern technological tools.

Following the Covid-19 pandemic, most universities are now doing distance or online teaching; the face-to-face method of teaching and learning has been reduced (EMP2). This is the basis for further developments in ICT knowledge and its application of which universities must take advantage of and operate more in the ICT environment than it is currently the case.

The participants articulated various ways by which universities could operate effectively and efficiently in ICT and HOT environments for skills development, including the following:

“Accounting studies should be based on using a particular ICT system because in today’s world, ICT is the game. The courses should be infused with ICT. If it is accounting, it should be related to ICT” (GRAD2U5).

“The universities must move from the paper and pen method to computer-based method of training accountants. This should reflect not only in the classroom but also when they write examinations. So, the use of accounting software should be a paramount part of the training of the accounting students” (EMP6).

As explained in the literature, the application of technology in teaching and learning makes lessons very interesting, ensuring that students take an active part in the learning process, which could be difficult to accomplish using traditional lecturing methods of teaching (Ainoo 2020:2). Besides, Segredo et al. (2017:35) report that the use of computers and other tools of technology in the teaching and learning process promotes critical thinking, problem solving and creativity, which are among the critical skills that accounting graduates need for employment and to be effective in job performance.

Greater efficiency in the use of technological tools will only be possible with the existence of adequate ICT infrastructure in the training institutions. The issue of ICT infrastructure in public universities came to the fore in the interviews as discussed in section 5.5.2.2.

5.5.2.2 ICT infrastructure concerns

Participants, especially the graduates and academic staff, were concerned about the ICT infrastructure available for teaching and learning of ICT skills at public universities. This was in response to the question “Does your university have the infrastructure required to effectively teach the ICT skills that accounting graduates require for employment?” In general, most of the participants described the ICT infrastructure – defined in the current study to include ICT laboratories, computers and accessories, and internet connectivity – as inadequate. The following specific situations regarding the ICT infrastructure in the universities were highlighted by some of the participants:

“For us as a department, we have already revised the accounting curriculum to reflect all the ICT and HOT courses, but the university does not have the resources to support its implementation” (AS2U4).

“The computers are not adequate, and they are also old. We need modern machines that compute faster than those that are there. We also have to improve on the network connectivity to be able to work faster with these tools” (GRAD1U5).

“All accredited public universities have complex ICT centres, but we understand the problem is about the number of computers available to be used by the students; inadequate computers, it is a challenge. In some institutions, the ratio is about one computer for 10 students. So, how effective will the acquisition of ICT skills be in that situation?” (GOV3).

“We have a huge ICT centre, but it is not enough, it is about the capacity. Sometimes, you get there, and the place is full. It is not in the form where students can practice anytime, they feel to do so. They cannot just decide to go to the computer laboratory and have access to the internet. So, if you do not have that chance then what does that mean?” (AS1U4).

The inadequate ICT infrastructure places lecturers, students and eventually graduates at a very great disadvantage, especially now that education is not only classroom-based, but also virtual. Evidence showed that, at the time of this study, the students were not provided with laptops; they had to buy it themselves, which was difficult for some of them (AS2U2). One graduate interviewee stated:

“At the end of the day, we were not able to acquire the ICT skills that we needed as an accounting graduate in the area of accounting practice” (GRAD1U3).

It is worth noting that few of the universities in Ghana have adequate computer laboratories and internet facilities accessible to both staff and students. Students were given special modems on which they had data uploaded on the sim cards upfront to use for internet-related work, and sometimes call credits but they also “face connectivity problems which emanate from the service providers” (AS2U5). As a result, “everyone resorted to using their own money to buy data before doing whatever we want to do” (GRAD2U5).

Participants’ responses were in line with the literature that ICT training at tertiary institutions in Ghana is faced with challenges due to low bandwidth, insufficient internet access, finances and insufficient computers taking into consideration the increasing number of students (see Asabere et al. 2017:179; Bofo 2018:93).

In light of this problem, and to ensure practical integration of ICT into the accounting curriculum, participants suggested that the management of universities and the government should, as a matter of urgency, “expand the computer laboratories and increase the computers to accommodate many more students at a time” (AS2U4). Furthermore, management of universities could provide laptops to facilitate the studies of students who are undoubtedly in need (AS2U5). Moreover, students could use part of the loan they receive from government to buy laptops to enhance their learning. One employer interviewee proposed that the university could appeal to philanthropists to provide them with more computers (EMP6). Furthermore, the government should

provide the “space for the adoption of the technology; for example, by providing a wide area network for all the universities especially in this Covid-19 time” (GOV1).

5.6 THEME 2: TWENTY-FIRST-CENTURY MULTI-DISCIPLINARY SKILLS

As discussed in section 5.3.1, participants were dissatisfied with the curricula of public universities in Ghana to equip accounting graduates with relevant skills for the world of work. As noted by a graduate participant, “we are in the twenty-first century, we need the skills that will enable us secure employment and be able to perform well at our places of work” (GRAD2U5). This view is in agreement with results stated in previous studies that there is an increasing demand for accounting graduates to acquire twenty-first-century skills to adapt swiftly and achieve success in the current competitive working environment (see Ackerman 2019:2; Alshare & Sewailem 2018:19; Cascio & Montealegre 2016:350; McGunagle & Zizka 2020:2). This demand is ascribed to the various effects of developments of ICT and globalisation in terms of business processes and accounting practices in many of these organisations (Osmani et al. 2017:318).

The theme “twenty-first-century multi-disciplinary skills” provides a broad description of the skills requirements of accounting graduates during the 4IR. Based on the data from the interviews, the category that resonates with the theme is computer application packages and soft skills. The related codes under this category are Microsoft computer and accounting software packages, HOT skills, interpersonal skills, entrepreneurship and innovative skills (refer to Table 5.5). The related codes are described in detail using direct quotes from the interviews, in addition to the findings obtained from the document analysis and summarised in sections 5.6.1.1–5.6.1.4.

Table 5.5: Twenty-first-century multi-disciplinary skills

RELATED CODES	CATEGORIES	THEME	THEORY
Microsoft computer and accounting software packages	Computer application packages and soft skills	Twenty-first-century multi-disciplinary skills	Bloom’s revised taxonomy
HOT skills			
Interpersonal skills			
Entrepreneurship and innovative skills			

Source: Author’s own compilation.

5.6.1 Computer application packages and soft skills

This category specifically reflects suggestions in terms of ICT and HOT skills that accounting students should possess upon completion of their accounting programme to enhance their employability and performance at the workplace. Table 5.4 shows the connection between the computer application packages and soft skills category and the related codes, namely Microsoft computer and accounting software skills, HOT skills, interpersonal skills, entrepreneurship and innovative skills, which emerged from the ATLAS.ti™ 9 grouping, all linked to Bloom's revised taxonomy. As described in section 3.4, Bloom's revised taxonomy (see Anderson et al. 2002:215) is a progressive hierarchy of thinking skills, from the lower levels of remembering, understanding and applying to higher levels of analysing, evaluating and creating. In the current study, this model guided the HOT skills accounting graduates should acquire to enhance their employment.

For the purpose of the current study, HOT skills, interpersonal skills, entrepreneurship and innovative skills were classified as soft skills. Soft skills are the various personal attributes, behaviours and social virtues that enhance the person's relationships, career prospects and performance (Vasanthakumari 2019:67). It is stated in the literature that the quality of a particular organisation, especially product quality, depends mainly on the soft skills possessed by the employees (see Cimatti 2016:98).

5.6.1.1 Microsoft computer and accounting software packages

In section 5.3.1, it was shown that participants emphasised the necessity of ICT knowledge and skills for employment in this era of technology. In the current section, the researcher identifies the types of ICT knowledge and skills that accounting graduates from the universities in Ghana need for their career. In the opinion of one employer interviewee, "accounting graduates are not ICT graduates, so they need ICT skills that has to do with Microsoft Excel, Word and PowerPoint presentation which are the basic tools required to work in a computer work-oriented environment" (EMP3). Concerning the specific ICT skills, "the graduates must be well versed in the use of advanced Microsoft Office packages, especially Microsoft Excel and accounting software" (EMP5). Other participants explained, "as an accounting graduate, you must

be able to use the Microsoft Excel to process or store data for the organisation's use" (GRAD1U4).

To explain the importance of the above-mentioned tools, graduate participants explained:

"Microsoft Excel is an essential ICT tool for preparing final accounts, analyse, reports and create schedules in a fast and accurate manner" (GRAD2U5).

"PowerPoint helps in presenting the reports that are produced" (GRAD1U5).

An employer participant added, "as an accountant, you need to do presentations, so you need to know how to use PowerPoint" (EMP1). Another participant expounded:

"[A] good knowledge in Microsoft Word and internet use are also very necessary in the situation where you need to produce and deliver documents by e-mail, especially in this era of Covid-19 pandemic where most of us are working from home" (GRAD2U3).

Another employer participant captured the types of ICT skills required by employers for effective and efficient performance of accounting functions as follows:

"At the barest minimum, the use of Microsoft Office packages seems to be the most common ICT skills that are required by the majority of companies. There has also been a new trend where people want to load, model and visualise data better and this seems to be slowly becoming an in-demand skill. That's the use of Microsoft Power BI (EMP4).

The document analysis confirmed that ICT or computer studies is mandatory for all students of the participating universities (refer to Table 5.1). The ICT policies of universities require that all students take some introductory courses in ICT. The ICT courses of 6 credits are taken mostly at levels 100 and 200 to ensure that the students are introduced to ICT to help them in their learning, and to show them how it will be applied in the work environment. Apart from the basic computer skills being offered by the universities, all participants required accounting software to be integrated in the accounting curricula and practically taught to equip graduates adequately for employment. One graduate participant noted, "ICT has moved to a level where now accountants are required to use certain software programs to process accounting data and prepare financial reports" (GRAD1U1). Another graduate participant, based on his experience, said that he wished they were introduced to accounting software at

university as some of them would have obtained employment immediately after they had completed national service (GRAD2U3). In the opinion of one employer interviewee:

“[T]he graduates are well vested in the use of most technological tools but what they lack is a specific accounting software expertise even though. They know the use of what’s up, going to the cloud and stuff like that” (EMP7).

Another employer interviewee said that the ability to use an accounting software program could enhance one’s employment, especially in foreign companies, because those that come to the country use accounting software. They do not use the manual system or Excel; they know only about accounting software (EMP1).

In a response to which accounting software should be incorporated into the accounting curriculum, the participants stated the following positions:

“Now accounting graduates need to have knowledge in accounting software like QuickBooks and other cloud accounting before they can get employment and be able to perform their accounting functions at the workplace” (GRAD1U1).

“Another important software that is currently being used in all public sector organisations in Ghana, which both accounting academics and graduates need to know is the Ghana Integrated Financial Management Information System (GIFMIS)” (AS1U5).

“I am looking at the universities incorporating Sage, Accounting Tally, Enterprise Resource Planning (ERP), Oracle, SAP [Systems Applications and Products] and probably some computerised assisted audit techniques so that the students will have hands-on experience during school” (GRAD2U1).

To address the limited accounting packages or software skills of accounting graduates, a government participant said, “currently, some of the universities have introduced a computerised accounting program to adequately equip their graduates with such skills for the job market” (GOV3).

The document analysis further confirmed that some of the universities (U1, U2, U4 and U5) offer a 3-credits computerised accounting course where students do practical accounting for the whole semester. An academic staff interviewee confirmed that they do receive positive feedback from most of the graduates, namely that having a

certificate in computerised accounting is helping them to get employment (AS1U2). Another academic staff participant confirmed that they teach Accounting Tally and those kinds of software, which enable students to have a feel of what it is to use software technology (AS1U4).

Surprisingly, a graduate participant remarked that they were taught Accounting Tally at the university, “but when you get to the industry, Accounting Tally is not really being used” (GRAD1U2). In the light of this, one of the academic staff participants summarised the issue of ICT skills that accounting graduates require in the following quotation:

“At least, as an accounting graduate, you should know basic computer skills especially Microsoft Excel and at least one accounting software. The wisdom in this is that, wherever you are going to work, the package of the organisation may be different; they may be using a software which you may not have the privilege to learn in your school but once you know Excel, and one other accounting software, whatever accounting software that comes your way when you are trained on your job, by virtue of your previous knowledge with Excel and whatever accounting package you have learned, you are ready to go” (AS1U5).

Figure 5.2 clearly displays in descending order of importance, the ICT skills and knowledge as indicated by the respondents.

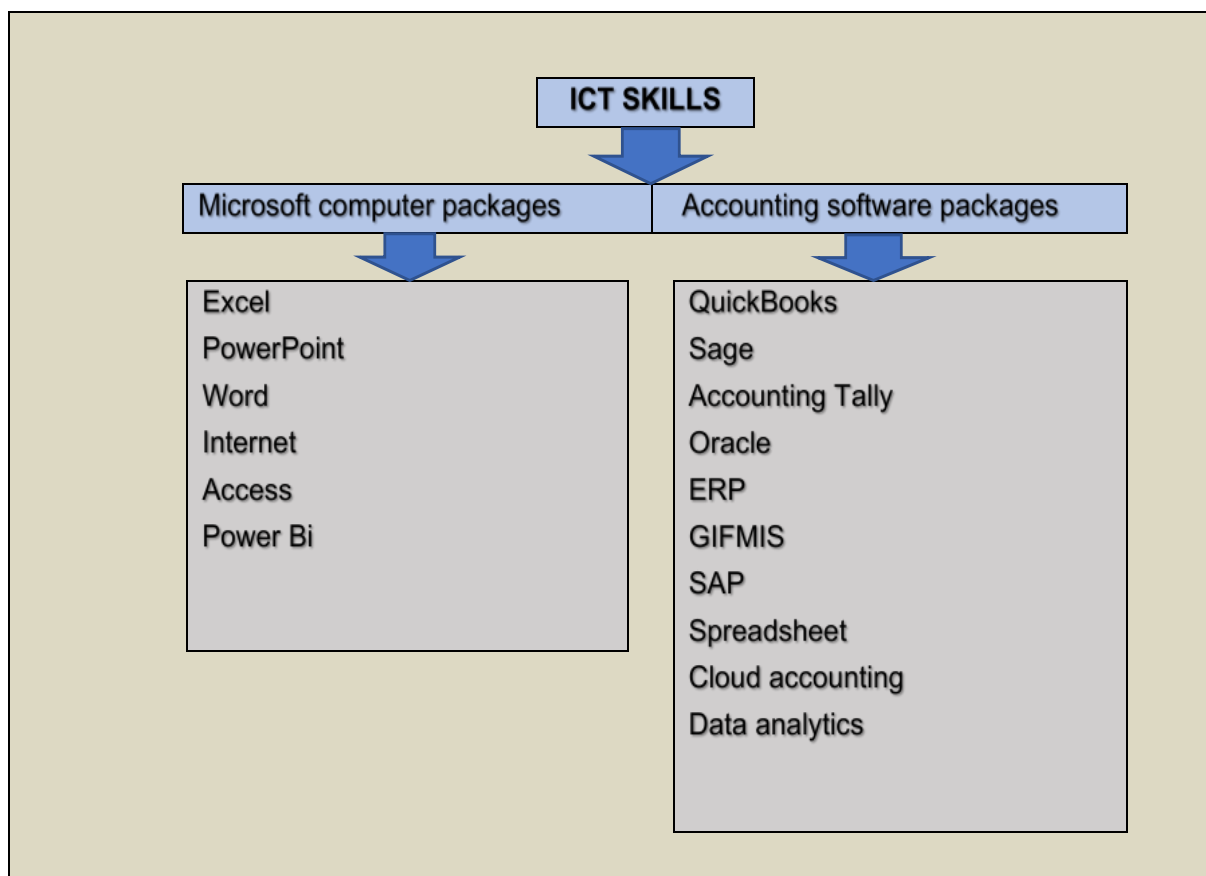


Figure 5.2: ICT skills of accounting graduates

Source: Author's own compilation

In Figure 5.2, the ICT skills identified from the empirical data have been categorised into Microsoft computer and accounting software packages. The Microsoft computer packages are Excel, PowerPoint, Word, internet use, Access and Power BI while QuickBooks, Sage, Accounting Tally, Oracle, ERP, GIFMIS, SAP, Spreadsheet, Cloud accounting and data analytics constitute the accounting software packages. These skills and programs are, according to the participants, most needed by accounting graduates in Ghana for effective performance of accounting tasks during the 4IR.

Having discussed the ICT skills requirements of the graduates, section 5.6.1.2 presents the findings in terms of HOT skills that graduates need for efficient and effective work performance in the twenty-first century.

5.6.1.2 Higher-order thinking (HOT) skills

In this section, the researcher identifies HOT skills that accounting graduates in Ghana need to perform effectively at their various workplaces. A graduate participant defined

HOT skills as “one’s ability to understand, analyse and interpret information that is processed for the purpose of decision-making” (GRAD1U3). To another participant, it was “people’s ability to think outside the box, where they go critically minded and analytical in problem solving in the workplace and about nature” (AS2U5). Yet another said, “HOT skills include the ability to think critically, analyse and solve critical problems at their workplaces” (AS1U4). Another definition of HOT skills was given by a graduate interviewee as “evaluating and analysing work-related problems and in doing so, the person is able to apply the accounting principles that he or she learned at the university” (GRAD2U2).

According to a graduate participant, “the application of HOT skills enables the individual to offer possible solutions and ideas to employers to overcome challenges and remain competitive in the world of work” (GRAD2U1). As indicated by an academic staff participant, “in the field of accounting, one needs to be critical and analytical because accounting is no more about chew and pour [memorising]” (AS2U1).

According to an academic staff participant:

“These HOT skills are required at the workplace and as much as we are professionals, we try to ask the higher-order thinking questions during the interviews to determine the candidates’ ability to think critically, evaluate and think outside the box” (AS1U5).

Evidence from the interview data shows that, even though HOT skills are much needed at the twenty-first-century work environment, “there is a larger number of accounting graduates out there who lack these skills” (AS2U4). One of the employer interviewees stated, “hardly are accounting graduates able to think critically, especially when it comes to the issue of professional scepticism and questioning ability” (EMP1). On the other hand, other participants – especially the academic staff – believed that graduates possess relevant HOT skills; so, they are able to think deeply and solve both personal and work-related problems with which they are confronted (AS1U1; AS2U1).

The importance of HOT skills was established by the current study. The document analysis of the accounting curricula of the participating universities (refer to Table 5.1) provided evidence of a 3-credit critical thinking or other HOT-related courses, such as psychology and basic law being offered by all the participant institutions as part of the level 100 courses. These courses are meant to train the minds of the students “to think

outside the box and to be critical and analytical in most of the situations they find themselves” (AS2U5). A graduate participant confessed:

“With the application of the HOT skills, I am able to understand the reports, interpret them and communicate the information as a professional to management for decision-making” (GRAD1U1).

Emphasising the importance of HOT skills and the negative effect it would have on accounting graduates and eventually on the accounting profession if it is not given serious attention in the accounting curriculum at university level, one academic staff participant who “personally see accounting as an endangered profession” warned:

“If we will stick to our simple debits and credits which could easily be automated, it can result more into the unemployment issue that we are talking about. We should try to equip the students with a lot of critical thinking and problem-solving skills, which computers cannot have to improve their employability in the variety of fields” (AS2U5).

The evidence is in line with the call in the literature that accounting programmes need to be restructured to include HOT skills to enhance the employability and effective performance of accounting graduates on the job (Ackerman 2019:2; Islam 2017:3; Jeremiah & Daferighe 2019:231; Ku Bahador et al. 2017:5512). It is understood that, in the field of accounting, together with the development of highly advanced technology, machines can calculate faster and more effective than accountants (Moffitt et al. 2018:9). But then, in thinking critically, creatively, strategising, and analysing complex conditions, accountants are better than machines and are best suited to present the information to those who need it (Fernandez & Aman 2018:127; Rkein et al. 2020:189).

As far as some of the participants were concerned, even though critical thinking and practical reasoning courses are being taught at the university level of education, “the courses were not taught well” (GRAD1U1). According to one of the employer participants, “HOT-related courses must be taught separately as a course so that by the time the students come out, they are well prepared to be able to think and handle critical issues” (EMP5). However, an academic staff participant disagreed with the fact that HOT-related courses were not meeting the needs of the current students and those who had already graduated. He maintained:

“The universities have exposed the graduates enough to HOT-related courses. Our students themselves do not seem to want anything that challenges them and so applying knowledge, thinking critically, trying to solve problems, become a reserve of a few serious-minded students rather than general students’ population craving for that, and I think that is where the problem is” (AS1U4).

5.6.1.3 Interpersonal skills

Interpersonal skills are the various lifetime skills that we use daily in interacting and communicating with others on individual and group basis (Obakpolo 2015:115). Peoples’ ability to exhibit good interpersonal skills is not only beneficial for the people working in an organisation but also to the organisation as a whole (Obakpolo 2015:115). As confirmed in the literature, employees who are able to listen, be in harmony with and communicate well with others are in high demand in the field of employment (Alshare & Sewailem 2018:19). In order to enhance good interpersonal relationships, especially at the workplace, a participant stated, “accounting graduates do not only need technical understanding of accounting, they also need much information about interpersonal skills and be able to communicate and demonstrate to others what they can do” (AS2U2). A graduate participant stated, “accounting is a team work, so the ability to communicate well with the team members is very important” (GRAD1U1). In addition, “accountants work under pressure and they have to exercise good judgements and effective communication skills to be able to satisfy their customers” (GRAD2U3).

In the words of one graduate participant:

“As an accounting graduate, you need soft skills, like taking responsibilities, ability work with people with different characters and other positive attitudes including emotional intelligence and then the ability to communicate clearly verbally and in writing” (GRAD1U2).

As a result of the importance of this category of soft skills, some participants proposed different ways of teaching to develop these skills effectively in students. According to one academic participant:

“As part of our teaching approach, we should integrate interpersonal skills so that by the time they graduate, they are very well equipped with these skills. Besides, we should encourage the students to be part of various movements and extra-

curricular programmes at their own level to help them to address some of these skills that they may not get in the classroom” (AS2U1).

Additionally, another academic participant proposed an integrated way of teaching to develop interpersonal relationships among the students effectively:

“Lecturers must engage the students in such a way that in the process of learning the technical skills, the soft skills will equally be developed. You have to engage your students in class that will bring out their communication skills. Put them in groups to do assignments to strengthen their inter-personal skills. Also, you give them assignments to bring their professional consciousness and how to deliver on time” (AS2U2).

5.6.1.4 *Entrepreneurship and innovative skills*

Looking at the alarming unemployment rate of graduates in Ghana, all the academic staff participants required accounting graduates not only to think about government and companies employing them, but also to look at finding ways of establishing their own businesses for sustainability. This was obvious, as one of the interviewees noted, “we need the graduates to be creative job creators and be part of [the] solution of [the] problem rather than waiting for somebody to employ them” (AS1U4). To achieve this aim, the employer participants called for entrepreneurship studies to be taken seriously in the various universities where the students are trained and encouraged to put the entrepreneurial knowledge into practice after they had graduated. One of the employer participants for example, indicated, “it is not enough to study only accounting at the university: accounting graduates need to add entrepreneurship skills to the accounting knowledge” (EMP5). Entrepreneurial skills are defined to include managerial, marketing, public relation, communication and accounting skills that make it possible for people to have opportunities to produce goods and services to satisfy the demand in society (Oluseye, Adebayo & Olulanu 2017:46). As pointed out by another employer:

“Now, the accounting profession is more about business understanding than just the core technical skills” (EMP1).

The outcome will be a shift from the normal core of preparation of financial statements to increased business understanding, value addition and marketing when it comes to the work of an accountant during the 4IR. Accordingly, the participants required the graduates to “prove to be well grounded in entrepreneurship and how to be innovative”

(GOV2) so that they can become employers right from the word go instead of waiting for someone to employ them. According to another government participant, “once the graduates have gone through the school system, learned and acquired the requisite skills, including entrepreneurship, they are not actually expected to come out looking for jobs, they are expected to come out and create jobs” (GOV1).

The document analysis established that, at the time of this study, entrepreneurship studies formed part of the accounting curricula of all the universities involved in the study. It is a 3-credits university-wide course offered either at level 300 or 400 “to develop the entrepreneurial and innovative skills of the students to be able to create and manage their own enterprises” (AS2U2). Some of the universities had a business incubator to develop business ideas that could help the graduates to meet the needs of society (AS2U2). It is expected that, when students finish university, they should not necessarily take their curriculum vitae and go from door to door looking for employment, but they should be able to create jobs themselves. An academic staff participant warned up-and-coming accounting graduates “to see these skills-oriented courses as what will prepare them for life and their career and not as an academic activity that should be forgotten after completing the university” (AS1U5).

According to participants, the need for entrepreneurship for accounting graduates in the twenty-first century cannot be over-emphasised as revealed in findings of the current study. This view is confirmed in the literature, namely that entrepreneurship, results in the creation of new businesses, contributes to a reduction in unemployment, and brings about an increase in economic growth (Asogwa & Dim 2016:39; Bokhari 2013:131; Oluseye, Adebayo & Olulanu 2017:50). However, it has been established that some of the graduates “have the business sense but they cannot apply it” (AS1U4). The same academic staff member iterated that the graduates from their university “go out there without really understanding business situations or cases such that the theoretical underpinning as well as their business acumen is far from them”.

The findings also show that participants were not satisfied about how the entrepreneurship courses were taught at most of the institutions. According to GRAD1U2:

“[T]he entrepreneurship course was not made practical. We just learn it for examination and after we passed, then we forgot it. If they can be made practical

whereby students can engage in projects whilst in school, upon completion of the school even if they got a job, they can take entrepreneurship as a side business to earn income to supplement their monthly salaries.”

In support of the position of GRAD1U2, another participant stated:

“Actually, we were taught the concept of entrepreneurship and were told to be self-reliant, but it lacked practicality. The lecturers should do more about such ideas practically so that once students come out of the university, they are prepared enough to go about doing their own businesses” (GRAD1U1).

Based on the above-mentioned issues raised by the research participants, it is clear that there is an urgent need for academics who teach entrepreneurship to adopt a practical approach to teaching the course in order to train the graduates adequately so that they can be innovative and figure out what they can do with their knowledge and skills, and be part of the solution to the employment problem. Again, the entrepreneurship course should be well designed and developed into a business development centre where business ideas can be nurtured, engaging all the disciplines in the school environment (AS1U3).

Supporting this position, one academic staff detailed:

“We should start training the students as business executives, then their orientations may change that their work is not only to keep the books. The students should be introduced to the real business world situation so that they will see the role that the finance manager or accountant will play within the scope of business, because in the real world of business things are not done separately” (AS2U2).

There is also a need for universities to train students during the entrepreneurship lessons to understand business start-ups and their driving forces better (Bokhari 2013:131).

5.7 THEME 3: QH AGENTS' ROLES TO PROMOTE DEVELOPMENT OF ICT AND HOT SKILLS

Concentrating on the individual and corroborative roles of the QH agents in promoting development of ICT and HOT skills of accounting graduates in Ghana, Table 5.6 provides a summary of the connection between the roles to promote development of the ICT and HOT skills theme, data categories and the linked codes that emanated

from the ATLAS.ti™ 9 grouping. The individual roles of government, accounting academics, employers and accounting graduates are discussed in sections 5.7.1–5.7.4 followed by their collaborative roles in section 5.7.5.

Table 5.6: QH agents’ roles to promote development of ICT and HOT skills

RELATED CODES	CATEGORIES	THEME	THEORY
Policy formulation and regulation	Individual roles of government	Roles to promote development of ICT and HOT skills	QH innovative model
Accreditation and quality assurance of programmes			
Providing resources for improved graduateness and employability or self-employment			
Creation of an enabling environment for doing business			
Conducting research	Individual roles of academics		
Fostering graduateness			
Practical exposure of students to 4IR technologies			
Undertaking and disseminating evidence from tracer studies			
Developing industrial practicum			
Fulfilling their role of being employers and supporting the uptake of graduates into the active economy	Individual roles of employers		
Assisting with effective work readiness programmes			
Support through investment and CSR			
Ongoing learning and skills development	Individual roles of accounting graduates		
Volunteerism and networking			
Developing the acumen to be self-starters and entrepreneurs			
Co-creators of relevant accounting curriculum	Collaborative roles		

RELATED CODES	CATEGORIES	THEME	THEORY
Facilitating work-readiness of accounting graduates			
Public–private partnership business establishments and supports			

Source: Author’s own compilation

5.7.1 Individual roles of government

To promote ICT and HOT skills development of accounting graduates, participants expected government to play various roles:

- policy formulation and regulations;
- providing accreditation and quality assurance of accounting programmes;
- strategically providing resources for improved graduateness and employability or self-employment; and
- creating an enabling environment for doing business.

Each of these roles is discussed in sections 5.7.1.1–5.7.1.4 below.

5.7.1.1 Policy formulation and regulations

The participants mentioned policy formulation and regulations concerning tertiary education, ICT and youth employment. Concerning tertiary education, the research data revealed that the government, through the GTEC, manages and regulates policies and programmes in the higher education space in Ghana to conform to the existing national policies and strategic direction of the country. One of the government interviewees summarised the roles of government policy regarding tertiary education as follows:

“We develop all the policies, provide the general national strategic direction for higher education, funding conditions and advice, institutional set-ups as well as the legal framework that guides all the universities for the government” (GOV1).

The findings indicated that the tertiary educational policy “is for the training of university students in general but there is no specific policy for training of accounting students” (GOV1). There seems to be a need for a specific government policy that should reflect how accountants are trained from the beginning to the end; where what the universities

want as the final product starts right from the secondary educational level when the students are first introduced to the accounting subject. In the opinion of an accounting staff interviewee:

“[T]he first time the students hear about accounting we must already be telling and trying to help them to figure out what the end result is. If we wait for them to get to university before they can get to see the changes that are required for employment, it will be too late or difficult for some of them to have that change at that point” (AS1U4).

It was also evident that Ghana has not done an assessment to know the number of accountants needed in the next five to ten years “but we are just producing accountants” (AS1U5). Consequently, AS1U5 requested:

“[P]olicies that would create more employment opportunities for them or assist them to create their own employment; otherwise, because of the advent of the Free Senior High School policy [see Kwegyiriba & Mensah 2021:77; Ministry of Education 2018:7], Ghana would have a lot of accounting graduates in the next few years without jobs” (AS1U5).

As part of the strategies to support the capability of academic staff to provide high-quality education and research, the Ghanaian government requires universities to have qualified academic staff in the subject areas and all-around infrastructure in terms of lecture halls and laboratories, computers and other equipment (GOV1). Even though, as revealed in section 5.5.2.2, these facilities are not adequate to support effective teaching and learning at some of the universities, by way of policy, government, “encourage universities to sign a memorandum of understandings [MOUs] with the industry to commit effort to provide the universities with laboratories and equipment to support the training of students” (GOV1). With the existence of well-equipped and adequate ICT laboratories, accounting students would get the opportunity to practice and master accounting and ICT skills and be well equipped for the employment market when they graduate.

In addition, within the strategic framework of producing skilled ICT graduates to satisfy the requirements of the domestic and global employment markets, government continuously facilitates the adoption of technology in teaching and learning (GOV1). For example, the Ghanaian government introduced a detailed programme, which is looking at innovating, training and delivery of skills through teachers in general using

technology, online-based computer simulation classrooms (GOV1). Again, the government negotiated with the telecommunication companies to deliver heavily subsidised internet services for students to be able to learn online. However, as discussed in section 5.5.2.2, the internet services and other ICT facilities in most of the public universities in the country are not adequate to support teaching and learning.

5.7.1.2 Accreditation and quality assurance of programmes

The accreditation of any degree programme by a statutory accreditation body is a hallmark of assurance that the programme satisfies the academic standards set by that body (Sanyal & Martin 2007:6). Accreditation, which is mostly commissioned by an appropriate and recognised government agency, ensures quality assurance, transparency and accountability in higher education and also facilitates mobility of students (Sanyal & Martin 2007:6). All government and academic staff interviewees affirmed that, at the time of this study, the universities and their programmes – including accounting – were accredited by the GTEC. It is therefore agreed that the institutions are in good standing and the quality of their programmes is assured. In addition, it confirms that what they are delivering does not fall short of the expectation of employers and other stakeholders. A government interviewee stated:

“We monitor to ensure that institutions deliver quality programmes to the students by accrediting and auditing the programmes, teaching content, staffs and eventually reaccrediting the programmes to ensure their validity and acceptance and also to meet international standards” (GOV2).

“[T]here is a quality assurance unit in all the universities where they do capacity building for all the lecturers” (GOV2).

Accreditation and reaccreditation also ensure that the institutions “have some level of infrastructure, including ICT, to enable them to deliver” (GOV1), and to “create a window for improvement in the curriculum” (GOV2). Accreditation allows that “when your accreditation expires, you reconsider what is happening in the job market and factor them into the curriculum” (AS1U5).

The empirical data also revealed that, in assessing or accrediting the accounting programmes, the accreditation panel includes persons from the academic and professional accounting institutions in addition to experts in the industry. This is to

ensure that the accounting programmes “have an in-built component of the professional and practical dimensions” (GOV3). As a result, accounting graduates supposedly should have the relevant knowledge and skills to get employment or create their own jobs to earn a living and to contribute to the economy of the country. This arrangement is in conformity with the literature, namely that, in assessing or accrediting academic and professional programmes, the role of government should be only regulatory, while industries, professional accounting bodies and educational think tanks must play the predominant role (Sanyal & Martin 2007:15). It was the opinion of one employer participant that “the government should ensure that regulatory institutions work more effectively when it comes to the training and certification of accountants” (EMP6).

5.7.1.3 Provision of resources

The problem of inadequate ICT infrastructure in the universities was mentioned in section 5.5.2.2. In addition to ICT infrastructure, the interviewees cited other resources, such as lecture halls, equipment (GOV2) finance (EMP5) business development (also called incubation centres) (AS1U3), reading rooms for students, learning and teaching materials (GRAD1U3) to be provided for the universities to improve graduateness and employability or self-employment. Previous studies confirmed the inability of the Ghanaian government to expand infrastructure in public universities in order to admit more students than is currently the case, which will assist with the development of the required human resources of the country (Asabere et al. 2017:179; Badu, Kissi, Boateng & Antwi-Afari 2018:67; Bofo 2018:93). The data revealed diverse views regarding whose responsibility it is to provide these resources. A graduate interviewee stated:

“The major responsibility of providing resources to public universities rest with the government” (GRAD2U4).

One of the academic staff interviewees also declared:

“The government needs to provide more resources to the universities, as simple as that” (AS2U4).

Whilst almost all the participants required government to provide such resources, the government participants had a different view. It was also the view of some of the participants that the universities themselves have a role to play in providing the

resources that they need because they receive grants or subsidies from government and also retain all internally generated funds (IGFs). They can therefore use some of the IGFs to provide infrastructure for ICT learning (GRAD2U4). However, it would be difficult for universities to depend on IGFs for all their infrastructure needs because literature shows that, even though the administrative costs of the universities continue to rise, grants and subsidies by government to all tertiary educational establishments have decreased in recent times due to financial challenges in the country (Badu et al. 2018:68).

A government interviewee also argued, “the government has done everything that they were supposed to do concerning infrastructure for the universities. So, it is now time for the universities to take up their parts” (GOV1). GOV1 further encouraged academia to carry out more research to win more grants to fund the activities of the universities.

Based on this, all interviewees emphasised the need for innovative strategies for financing the infrastructural needs of the universities, including considerate government collaboration with financial institutions and other stakeholders to that effect. As concluded by one academic staff interviewee, “no one institution – especially those in the public space – is capable of providing all the necessary resources on their own” (AS1U4).

5.7.1.4 *Creating an enabling environment for doing business*

In the opinion of all participants, government should create an enabling environment for the industries, especially those in the private sector to grow so that they will be able to employ more graduates. According to a government interviewee, “the private sector is the engine of growth and development” (GOV3). Participants identified the following means by which the government could achieve this important objective for the benefit of accounting and other graduates:

- Projecting the industries in the media as recognition for their contributions in terms of their social corporate responsibilities to the graduates or the universities (EMP7); and
- Granting some form of subsidies and tax rebates to the industries that accept graduates without the required relevant skills and experiences as mentees or who give them permanent employment (GRAD1U1). Even though there exists such a

scheme for organisations that employ those graduates, “the government can do more, including provision of payroll support for employers” (EMP1).

It was the belief of the research participants that the availability of these interventions and environments would not only encourage the setting up of new industries, but would also enable existing ones to expand their businesses (GRAD2U2), and eventually take on more graduates to work for them to reduce the unemployment rate among graduates as a whole (GRAD1U4).

5.7.2 Individual roles of academics

The analysis of the data revealed several roles of the university (academics) to enhance the employment of accounting graduates, such as –

- conducting research;
- fostering graduateness;
- practical exposure of students to 4IR technologies;
- undertaking and disseminating evidence from tracer studies; and
- developing industrial practicum.

Sections 5.7.2.1–5.7.2.5 below describe these roles.

5.7.2.1 Conducting research

Conducting research was identified by most of the research participants as the primary responsibility of academics. According to Ahmad (2016:2), research constitutes the appropriate tool for academics to develop knowledge. Consequently, interviewees required academics to combine research and training abilities in new modes that could translate into formation of new business, particularly in the field of technology (EMP1). Through research, accounting academics should find out from the industries which employable skills they need and which kind of accountants they prefer, and then the accounting academics would try to steer their curricula in that direction to help the students (GOV3).

Because of the importance of research to education and economic development, participants appealed to academics “not to leave their research work to stay on shelves to gather dirt without engaging policymakers, employers, the communities and other

stakeholders to become aware of their research findings” (AS1U3). Another academic staff member acknowledged this problem about research but also maintained that although some research findings are made available “in most cases, the right people are not gotten to embrace these findings and implement them for the benefit of society” (AS2U3).

To promote and ensure maximum benefits of academic research, universities should establish a research fund to support the research activities of academic staff (EMP2) and academics should endeavour to collaborate with those industries and government agencies who would benefit most from the research findings (GOV3).

5.7.2.2 *Fostering gradueness*

The participants, particularly the government and employer interviewees, urged accounting academics to focus on which competencies accounting students should have on graduation. An employer participant said, “the graduates are expected to possess the knowledge, skills and attributes that the employers require of them or to enable them to establish their own businesses at the end of their qualifications” (EMP6), and “it is up to the universities to train the requisite skills and competencies for industries to capitalise on for the production of goods and services” (GOV1). Explaining his position further, the government interviewee posited:

“Once they have gone through the school system, learned and acquired the requisite skills, including entrepreneurship, they are not actually expected to come out looking for jobs; they are expected to come out and create jobs. If they fail to do so, it is an indictment on the lecturers’ performance” (GOV1).

To achieve gradueness of the accounting graduates therefore, participants called for the right environment to be provided by the universities for students to learn without difficulties. In addition to the universities having well-equipped libraries and ICT laboratories, GOV1, in particular, expected accounting academics to have “professional accounting qualifications as well as the pedagogical skills to teach the students”. An academic staff participant encouraged academics to attend workshops to update their knowledge and teaching skills for effective delivery of the courses (AS1U3). Furthermore, accounting academics should continue to encourage students and graduates to accept the changes in the accounting profession concerning more emphasis on ICT and HOT skills (EMP4).

The remarks of the participants affirmed the results of previous studies, namely that academics are critical in fostering gradueness through a well-designed curriculum (Clarke 2018:11; Heang et al. 2019:1074; McCowan 2015:281). However, other studies maintain that employers, government and other stakeholders also have a duty to integrate work-related skills into their training programmes (Aloysius 2019:24; Gammie et al. 2002:66; König & Ribarić 2019:88).

5.7.2.3 Practical exposure of students to 4IR technologies

One of the employer interviewees mentioned, “with the arrival of the 4IR, about 99% of what we do currently is ICT-based” (EMP2). The 4IR is influencing several parts of business processes and is changing the role of accountants in their areas of expertise. For instance, many organisations have accounting software that can keep business transactions and produce financial reports more accurately and efficiently (Tsiligiris & Bowyer 2021:4). This implies that accounting academics need to concentrate on practical exposure and training of students concerning the use of these 4IR technologies. As pointed out by one of the employer participants:

“The 4IR should no longer sound abstract to the graduates. They should be introduced to certain components of the 4IR such as mobile devices, Internet of Things [IoT] platforms, location detection technologies, smart sensors, big data analytics and advanced processes and data visualisation. The brief exposure to some components of the 4IR makes them ready to embrace new technologies resulting from the 4IR” (EMP4).

Similarly, an accounting academics stated that “the 4IR is about the use of technology at the workplace, the use of computers and other machines that would enhance the job of the accountant” (AS1U2). From the responses of some of the participants, it was established that accounting academics are unable to expose accounting students practically and adequately to the technologies that are required for effective work performance in the 4IR. This means that, in the era of 4IR, accounting graduates from Ghanaian public universities may find it difficult to get employment or may not be able to perform accounting functions adequately “unless they are further trained in-house” (AS2U1).

A graduate participant remarked:

“In recent times you realise that the use of robots, cloud computing, artificial intelligence and then the ERP [enterprise resource planning] software are being used to automate accounting processes but we were taught less of these ICT tools in the university” (GRAD1U5).

An academic staff participant also bemoaned:

“Everything now is about the internet, there is cloud accounting and there are new businesses coming in that direction; new ways of financial reporting, new types of assets and liabilities and expenses are exposed in that environment. Entities are moving towards that fourth industrialised space, and the people we are training do not even know what that is. We are not teaching cloud accounting here in this university and I can say if for a fact, except that it is mentioned to them” (AS1U4).

It was clear from the conversations of participants that there is a gap between how fast industry and the accounting profession are moving and how slow the training of accounting students is catching up.

5.7.2.4 Undertaking and disseminating evidence from tracer studies

Nugraheni, Susilawati, Sudrajat and Apriliandi (2020:110) define tracer studies as studies of graduates to obtain useful information to evaluate the outcome of education being offered with the ultimate aim of improving the quality of education at the university concerned. The data revealed that none of the participating universities had a systematic way of tracing and interacting with past students to get feedback on where they were, which work they were doing and how they were faring. One academic staff confessed:

“After the students exited the school, we do not follow up. I am not aware of any system of following up on them. So, I think that will be something we should look at” (AS2U2).

Accordingly, participants – especially the government interviewees – required tracer studies to be conducted “at both the academic staff and institutional levels which would then fit into the national level” (GOV1). The feedback from such studies would enable institutions to determine whether the graduates were having employment challenges or not and which reasons accounted for either of the situations. Furthermore, tracer studies would assist to determine whether those who are able to secure employment

are performing on the job or not (GOV2). Moreover, academic staff would be able to obtain information from past students in industry about new areas they need to include in the curriculum to enhance the capabilities of their future graduates (GOV3). The importance of tracer studies was further emphasised by a government interviewee in the following statement:

“The universities are expected to conduct tracer studies as part of their programmes of sustainability and to disseminate the evidence from such studies for policy decisions” (GOV1).

According to the literature, tracer studies provide valuable feedback not only for management of universities concerning their programmes but also for tertiary education policy formulation (Kalaw 2019:547; Nugraheni et al. 2020:110). A tracer study conducted by Kalaw (2019:547) provided relevant feedback that resulted in the enhancement of the curriculum of a BSc Mathematics programme of a Philippine higher educational institution to improve the quality of the graduates in the labour market.

5.7.2.5 *Developing industrial practicum*

Evidence showed that a lack of relevant practical industrial experience also accounted for most of the accounting graduates’ inability to get employment. Employers mostly require about five or more years’ relevant working experience on the jobs that are available but the newly graduated accounting students do not have such working experience (GRAD1U3; GRAD1U5). Accordingly, participants advocated for more industrial attachment or practicum to be incorporated into the accounting curriculum of all universities. This way, students will be able to “get the practical aspect of what they are being taught in the universities” (EMP4) and eventually “acquire the needed skills and experience for the end-user industry” (EMP2).

A revelation was made regarding the importance of students’ industrial attachment by an employer interviewee:

“When the students come from the university having the skills and practical understanding of the work environment, then it makes our jobs easier, and everyone would want to employ them because it takes us about two years to get them to learn the right things pertaining to the work environment” (EMP1).

It also became clear that, even though all the universities encouraged their students to undergo industrial attachment, participants wanted the programme to “be more effective to achieve the intended purpose” (EMP4) due to various criticisms levelled against the programme. In the first place, the programme is only two to three months in duration, which is woefully inadequate. Nothing much can be learned within that short period (EMP5). Secondly, “the programme is not well supervised and scored” (EMP2). The solution in this regard is that it must be well supervised and scored to form part of the final assessment of the students. This way, the students will attach more seriousness to it, and such programme will help them to acquire the required skills and experience when they go on to internships. Thirdly, some of the organisations – especially the public ones – find it difficult to expose students to the kind of things they do. In most cases, the students are therefore sent on errands (AS1U1). This observation is consistent to the study conducted in Poland by Januszewski and Grzeszczak (2021:14) who found that accounting and finance students on internships were not assigned to perform any major accounting tasks. They only observed how such functions were carried out by the accounting staff.

It has been suggested that universities should engage employers constructively so that they can accept more responsibility towards the students during their internships (AS1U3). Another academic staff participant appealed to industry players to be “ready for synergy-sharing in this regard and [they] must not think that they are doing the students or the graduates a favour” (AS1U1).

The interview data indicated that, at the time of this study and in all the universities under study, students were undertaking industrial practicum during long vacation periods after the first and second years of study. One of the academic staff participants (AS1U5) preferred the industry practicum to be taken in the third year and for the whole academic year. The students will stay on the job (without academic work) and return to campus in the fourth year to complete their qualification (AS1U5). This is because the students would have finished learning all the general courses and would then be taking the main accounting courses to be able to connect well to the practical aspects of the accounting topics.

5.7.3 Individual roles of employers

Employers, being part of the QH innovative agents of the current research, are expected to play the following roles in the development of ICT and HOT skills: assist with effective work readiness programmes (internships), and support the universities through investment and CSR. These roles are discussed in detail in sections 5.7.3.1–5.7.3.3.

5.7.3.1 Fulfilling their role of being employers

Having spent money and time to complete their university studies, it is the expectation of graduates to find a well-paid job and earn a decent living (Hwang 2017:2). However, the responses provided by the research participants and the literature indicated a high degree of unemployment among accounting graduates in Ghana (refer to section 5.5). Evidence showed that the responsibility to provide employment to graduated students rest with the industries and other institutions. An academic participant argued that, although the universities employed some of their graduates, that was quite insignificant compared to other employers (government and the private sector) (AS2U5).

As stated by one of the government participants, “the universities have trained the graduates with the requisite skills and the government has also provided the policy space to facilitate the employment of the graduates, so it is left to industries to capitalise on that” (GOV1). The participants’ views are consistent with literature, which states that employers can take advantage of developments in knowledge to create new products and services to meet public demand, which would eventually create employment opportunities for graduates (see Bilbao et al. 2016:313). By this, employers would be fulfilling their role of creating employment, stimulating the economy as well as supporting the graduates to play an active role in the economy

5.7.3.2 Assisting with effective work readiness programmes (internships)

It was the opinion of the participants that, because employers are the consumers of products of the universities, they must also contribute in a way to help the universities in the training of the students. The findings of the current study revealed internship as one of the several ways by which the industry could assist to equip accounting

graduates effectively for the employment market (refer to section 5.4.3.1.2.5). An academic staff participant argued:

“We are the primary agents of training ... our job is to train the minds of the students and give them the requisite knowledge. So, it is the responsibility of the industry to provide them with an opportunity to acquire the skills and practical work experience that are requisite for the employment market” (AS2U2).

Another academic staff participant maintained:

“[W]hat we all should accept is that the universities are not actually going to train accounting graduates who would be fit for the purpose for every organisation; it is quite an impossible thing to do” (AS1U5).

According to one academic participant, an opportunity for students to do internship should be seen as “a win-win approach because the employers will not pay the students and by virtue of the students being there, they will be learning and also be contributing their quota to the benefit of the organisation” (AS1U5). Again, participants advocated for the industry to be ready to retrain these students when they come out of the universities. Employers should therefore not assume that students have been fully trained (AS2U4). In fulfilling this role, employers will be supporting the uptake of graduates into the active economy.

Literature confirms the importance of internship of fresh graduates (Arul, Asirvatham & Lakshmi Priya 2017:16). As a result, employers have a duty to provide internship or work experience to students to enable them to secure employment when they graduate (Arul et al. 2017:16; Gammie et al. 2002:66). To some extent, this would minimise the criticism against universities of not being able to train graduates adequately to meet the skills requirements of employers.

5.7.3.3 *Giving support through investment and corporate social responsibility*

Some of the participants understood that government alone cannot provide all the infrastructure, equipment and finance that universities need to train graduates for the employment market. Employers are therefore called upon to support universities with some of these needs because “they are those that will benefit from the products of the

universities at the end” (GRAD2U4). According to the participants, employers could support universities in the following areas as part of their CSR:

- providing infrastructure, such as libraries, lecture halls, ICT laboratories, to assist universities to admit and train more students for the world of work (GRAD2U4);
- providing computers, accounting software packages and other material for teaching and learning of ICT (GRAD1U3);
- specifically providing laptops to outstanding students who are in need to facilitate their studies (AS2U5);
- establishing training and development centres to train newly graduated students to undertake practical skills development in various areas of specialisation to enhance their employment or to enable them to establish their own businesses (AS1U1);
- financing the research activities of the academia to know the kinds of skills and competencies that employers will require from accounting graduates (EMP5);
- supporting other research work of universities – especially if the research is in the domain of that particular industry (GOV3); and
- establishing scholarship schemes for needy but outstanding students or graduates for further studies or training in their companies or other companies (GRAD2U3).

These quotations demonstrate how the corporate world, through CSR and investment could contribute to the development of education, particularly at the university level. Such investments would not only enhance students’ performance and quality of education, but would also facilitate the production of quality accounting graduates for the industries.

5.7.4 Individual roles of accounting graduates

In this section, the researcher discusses the roles that accounting graduates should play to enhance their employability. It was the opinion of many of the interviewees that, once the graduates went through the university system, it means they have acquired the basic knowledge and skills required for the world of work (EMP3; GRAD2U5; GOV2). Those graduates who are yet to get employment should therefore continue to add value to themselves. Based on the findings of the current study, the various ways they can achieve this are:

- ongoing learning and skills development;
- volunteerism and networking; and
- developing the acumen to be self-starters and entrepreneurs.

These roles are discussed in detail in sections 5.7.4.1–5.7.4.3 below.

5.7.4.1 Ongoing learning and skills development

One important thing that unemployed accounting graduates could do to secure employment is to add value to themselves through continuous training and upgrading their knowledge (GRAD2U5). Many of the participants, particularly EMP1, GRAD1U2 and GRAD2U1 advised unemployed accounting graduates not to limit themselves to what they have acquired at university but rather to endeavour to improve upon their current knowledge and skills. They must “continuously develop themselves to be able to add value to the organisation that they may be working for” (GRAD2U5). For example, “they can add professional certificates to their academic qualifications” (AS2U1).

As revealed by the interview responses, accounting employers prefer accounting graduates with both academic and professional qualifications for employment to graduates with only academic qualifications. The graduates can also add value to themselves by “acquiring industry attachment” (GRAD2U1) as well as “having additional skills including ICT” (EMP5). EMP1 advised those who are pursuing professional accounting qualifications to read articles relating to the work of accountants. This is because such articles contain information about current developments as well as practical ways of doing things in the field of accounting. Another employer participant also advised the graduates to “read wider and appreciate trends in the industries and what is happening in the economy without restricting themselves to only their areas of study so that, they can support the industry well when they are employed” (EMP3). Explaining his point further, EMP3 said:

“[O]nce they continue to grow their skills and undertake lifelong learning; they can secure jobs. The point is that, if you all have the same basic qualification, then the employer will be looking for that extra thing that you have which other candidates do not have to achieve results.”

According to an academic participant, “the graduates have a lot of things to do to enhance their employability; they need to take advantage of all the opportunities and develop themselves personally” (AS2U2). “Fortunately, they can get relevant information now through the internet” (EMP2).

An academic participant posited, “no matter the number of courses the universities put in; it will not be enough to satisfy the graduates because the world out there is constantly changing” (AS1U5). This implies that whatever the universities are teaching in the classroom would not be enough for them to become what they want to be. “Learning is not a one-stop shop. They need to learn from everywhere, every day, and at every opportunity” (AS1U5). In conclusion, an employer interviewee advised unemployed accounting graduates to demonstrate the qualities of humility and willingness to learn in addition to the skills, knowledge and experience that the employers require of them (EMP1).

5.7.4.2 Volunteerism and networking

One of the things that unemployed accounting graduates need to do to enhance their employability as revealed by the interview responses, is to be involved in voluntary work and networking. Volunteerism is a means by which unemployed graduates can obtain practical experience and ultimately create and add value to themselves (GRAD2U1). An academic participant argued that graduates should learn to offer voluntary services to corporations and assure them that they do not have to pay them anything so that they can use the opportunity to learn relevant skills and build on it (AS1U4). An employer interviewee revealed:

“There are some organisations which will require their services, though they may not have the money to pay them the required wages. They can give them some money to cover their travelling expenses. By this voluntarily work, they will get the experience that they lacked at the time of their graduation and will now be well prepared you for the job market” (EMP7).

The graduates can also create and add value to themselves to enhance their employability through networking. “They should make effective use of their WhatsApp platforms to share information” (AS2U1). Through networking and collaborations, “they [graduates] can master the use of relevant ICT gadgets to enable them to secure employment” (AS2U3). According to GRAD2U1, “your network shows your net worth”.

Accounting graduates need to network with other people, at any gathering or on any platform so that whenever there is an opportunity, “the person who already knows you and what you can do, can invite you to take that opportunity” (GRAD2U1). Through various platforms, unemployed graduates could “compel the government to formulate policies that would help them to get employment or create their own businesses” (EMP5).

5.7.4.3 *Developing the acumen to be self-starters and entrepreneurs*

In section 5.6.1.4, research participants vigorously advocated for entrepreneurship studies to be taken seriously at the various universities. This would enable accounting graduates to be job creators rather than waiting for somebody to employ them. As established in section 5.6.1.4, at the time of this study, all universities offered entrepreneurship studies to equip students with entrepreneurial and innovative skills to be able to create and manage their own enterprises. Consequently, participants urged the graduates “to capitalise on those skills, take risks and innovate ideas to create employment for themselves and others as well” (GOV2). Other participants advised:

“If the graduates are not able to find a job, they can create one for themselves” (AS2U2).

“They should not take delight in just completing university without applying what they have learned. So, we need a lot more of them being creative job creators, part of solution of the unemployment problem, rather than waiting for somebody to do these things for them” (AS1U4).

“They can also come together to form their own firms and employ others rather than depending on the government for employment” (GOV3).

Although the participants urged accounting graduates – especially those without employment – to develop the acumen to be self-starters and entrepreneurs, it was evident that the graduates would not succeed as entrepreneurs “without the support of government and other institutions” (AS2U4). Some of the interviewees raised the following concerns about fresh accounting graduates’ ability to establish and operate their own business ventures:

“It would be difficult for fresh accounting graduates to establish their own business. In fact, most of them will fail because they have no practical work experience. I will

rather prefer that they join the employment market to gain a different kind of experience so that when they later establish own business, they can better manage them” (EMP5).

“Actually, the current situation in the country do not easily permit accounting graduates to establish their businesses. This is because coming by your start-up capital is not easy” (GRAD1U1).

“They do not have the collateral that can serve as a backing for accessing capital to start their own businesses” (GRAD1U5).

“[S]ometimes you can receive all the training that is needed but you may not be able to start your own business. So, that accession that university accounting graduates have been trained to the extent that they would be able to start their own business, may not necessary be true” (GRAD1U3).

It is clear from participants’ comments that there is a need for unemployed accounting graduates to establish their own businesses using the knowledge that they acquired from the university. Several studies encouraged all unemployed graduates in Ghana to take bold steps and create their own businesses (see Asogwa & Dim 2016:39; Dadzie et al. 2020:28). This will not only serve as a means of escaping unemployment, but also as a way of contributing to the economic development of the country (Aning, Afful, Dawson & Agyenang 2021:6; Biney 2015:10; Dadzie, Fumey & Namara 2020:28). However, this would not be possible unless the graduates are assisted in various ways. To start with, the graduates can be coached or guided and also provided with funding. This finding aligned with the literature that the key to the success of entrepreneurship are training, human capital and finance to start the business to make the entrepreneurs credit-worthy and able to qualify for loans, which are mostly approved based on collateral or financial security (Asogwa & Dim 2016:38; Dadzie et al. 2020:28; Gyan 2020:1880; Othman, Mokhtar, Tham & Yong 2021:17). The National Employment Policy (see Ministry of Employment and Labour Relations 2014:36) suggests the introduction of practical steps to be taken to support the development of entrepreneurship, mostly among the youth (Dadzie et al. 2020:38).

5.7.5 Collaborative roles of QH actors

Based on the interviews, the corroborative roles of the QH agents involved in this study for the development of ICT and HOT skills to enhance the employment of accounting graduates are:

- co-creators of relevant accounting curriculum;
- facilitating work-readiness of accounting graduates; and
- public–private partnership business establishment and support.

These roles are discussed in detail in sections 5.7.5.1–5.7.5.3.

5.7.5.1 Co-creators of relevant accounting curriculum

All the participants believed that equipping accounting graduates with the relevant skills to meet the market demand cannot be done by just one person or group of persons. From the responses of the participants, this appeared not to be the case with regard to the creation of the accounting curricula of the universities. One of the academic staff participants identified this challenge and declared:

“The biggest challenge actually in the developing world, including Ghana, is that, we are producing products that employers cannot readily use, so there is employment gap” (AS1U3).

To close this employment gap, the same academic staff advocated:

“We should do the curriculum together with those in practice and the business so that the outputs will be for their consumption. They know what they want so we cannot develop the curriculum in isolation and then when the graduates come out, they are not accepted. No, it will not work that way” (AS1U3).

It was clear that academics, employers and government in addition to the graduates have critical roles to play in determining the contents of the accounting curriculum to be beneficial to all stakeholders. Particularly, the employers and government are those who make use of the products of the universities; there is therefore a need for them to coordinate and monitor what the universities are doing in terms of the skills and knowledge they provide “otherwise, there will be a big problem” (GRAD1U4). A conversation is required between the universities and the end users of their products about the skills set that accounting graduates in particular need for employment because the universities cannot employ all their graduates (AS2U5).

According to one employer participant, “right from the stage of developing the modules, they must be shared with the government, employers, alumni associations and experts to make inputs and how they can be modified to serve the future interest of the graduates and employers” (EMP3). If academia, government and private sector employers are able to collaborate, then the courses that the universities offer will always meet the requirements of the industry (AS2U2).

This position of participants on curriculum development corroborates with the literature that, in the process of integrating ICT and HOT skills and abilities into the university curricula employers, graduates and other stakeholders can provide input regarding programme development, not only as part of programme accreditation and review, but also at the level of teaching and assessing of courses (Crebert et al. 2004:162). Such relationship among the stakeholders would enable the end users to inform universities constantly about new developments, skills and competencies to be imparted to the graduates in order to enhance their employment (GRAD1U4). At the end, the participants suggested a joint committee or body comprising members of the academia, government and the Ghana Employers Association “to dialogue on regular basis to know each other’s needs for practical steps to be taken to meet those needs” (AS2U2).

5.7.5.2 Facilitating work-readiness of accounting graduates

As reported in section 5.5, newly graduated accounting students lack relevant ICT and HOT skills and practical working experience to enable them to secure sustainable employment. According to an employer participant, “it is because there is a huge disconnect between academia and the industry” (EMP7). Accordingly, participants called for serious conversation between universities, government and employers to assist in the transition of accounting graduates from academia to the world of work. This conversation should include the university providing a springboard from which graduates can be trained further by employers to meet their specific needs (AS2U5).

An academic staff further argued,

“[T]here is no amount of university or technical training that can make a graduate fully ready. So, the employers have their own role to play by exposing them to what they want them to do” (AS1U4).

A graduate participant was also of the opinion that “there are more knowledge that accounting graduates have to acquire, that is going to come from the field” (GRAD2U1). Further, a worried graduate interviewee said the students and the newly graduated ones “are looking for certain skills and work experience in a particular industry, and not necessary money” (GRAD1U5). Implementation of a policy would therefore help considerably in providing opportunities for all students of various disciplines to acquire the needed skills and experiences that employers are looking for (GRAD1U5).

As part of the conversation, accounting academics also have to “find a way of getting practical experience from industry to inform their teaching” (AS1U4). In addition, academics were encouraged to involve industry players in the training of their students by “inviting them to come and share practical knowledge and ideas with students so that the students can be better informed of what things are expected of them in the field of work after graduation” (EMP6). Furthermore, the universities can create a platform for their alumni who are captains of industries and professionals to be invited to share their experiences and expertise regarding the things that are happening in the workplace “to inform the students about what skills and competence are required of them after they graduated” (EMP5) and as well “be mentors to the students” (GRAD2U5). Through mentorship programmes, the universities can actively find placements for their graduates (AS2U1).

In support of this kind of collaboration, an employer participant confessed:

“We are looking forward more to these kinds of collaboration to solve the skills problems partly from the university level otherwise, we will have to put in more resources to train the people when we employ them” (EMP1).

To facilitate the work-readiness of accounting graduates, a graduate participant further suggested a government–industry collaboration to establish skills training centres where students and even graduates can undertake practical skills development in various areas of specialisation to enhance their employment or to enable them to establish their own businesses (GRAD2U3). After the practical skills development, “a system should be established to assist accounting graduates who are interested in establishing their own business to do so” (GRAD1U3). This is because establishing and operating a successful business may not only depend on skills; it may also require

good management and support systems. In section 5.7.5.3, the researcher discusses how business establishments and support for start-ups could create employment opportunities for accounting graduates.

5.7.5.3 Public–private partnership (PPP) business establishments and support

It was the view of almost all the research participants that accounting graduates should not only think about government or companies employing them; they should also think about and find ways of establishing their own businesses for sustainability. However, it was evident that this can be difficult unless practical measures are put in place to assist those who are willing and ready to do so.

A graduate interviewee stated, “newly graduated accounting students could receive all the training that is needed but may not be able to start [their] own business” (GRAD1U3). For them to be successful in setting up their own businesses, newly graduated accounting students need financial support, mentorship, coaching and capacity building (GRAD1U3; GRAD1U5). The participants recommended that the government should establish some funds to support accounting graduates who want to venture into private businesses (EMP5), or should collaborate with financial institutions or venture capitalists to provide cheap and easily accessible funding for graduates who want to set up their own businesses (GRAD1U5).

An academic staff participant acknowledged that the government has an agency that provides soft loans to start-ups and small and medium-scale entrepreneurs to support wealth creation and employment, but it has not been honest and transparent in distributing the funds (AS1U1). It must be noted that none of the government respondents responded to this statement.

According to an employer interviewee, the government could also partner with the private sector to create more industries, such as the One District, One Factory (1D1F) programme (see Eshun 2019:156). Evidence from the interview data shows that the 1D1F programme constitutes a major element of the current industrial transformation strategy of the Ghanaian government. However, the document analysis did not reveal the 1D1F as an employment creation strategy for unemployed graduates. The 1D1F involves setting up a minimum of one medium or large-scale factory led by the private

sector in all administrative districts of Ghana with the aim of creating employment, especially for the youth living in the rural areas, as a means of improving their income levels and enhancing their living standards, among others. This is intended to help create more employment opportunities for graduates (EMP4). As a way of growing small-scale businesses and creating employment for accounting graduates, another employer participant suggested that government could establish accounting bureaus in the district capitals to provide accounting services, such as payroll services, filling of tax returns, preparation of annual financial statements, and other accounting assistance to small industries. Government should then pay the salaries of graduates who will be working in these accounting bureaus, as the graduates will be able to serve clients at a minimum cost (EMP3).

Participants commended the government for the NABCO programme (see (Acheampong 2019:14; Kwofie & Dadzie 2020:14) for both public and private organisations to admit and train fresh graduates and employ them for a three-year period (GRAD1U1). However, participants were concerned about the sustainability of the NABCO policy because “it lacked legal backing to provide employment to the graduates on a permanent basis” (GRAD1U3).

5.8 MODIFICATION OF CONCEPTUAL FRAMEWORK

On the basis of the document analysis and responses from the interviewees, the original conceptual framework displayed in Figure 3.5 was modified as shown below in Figure 5.3. The modifications that were made are the following:

- RPA has been excluded from the modified conceptual framework because the empirical data did not consider RPA as an important ICT requirement of accountants in Ghana. With particular reference to RPA, “it is not something that the business owners in Africa will encourage so much” (AS1U3).
- Microsoft Excel, Access and PowerPoint have been included in the final conceptual framework to indicate their importance for accountants in terms of processing and presentation of accounting information to users for decision-making purposes.
- Microsoft Power BI has also been added to the new conceptual framework because, according to the results of the current study, it is slowly becoming an in-demand ICT skill for accountants to load, model and visualise data better.

- Interpersonal and entrepreneurship skills emerged from the study as two further key skills that, if they are properly developed, in addition to the ICT and HOT skills, could assist in reducing the unemployment of accounting graduates.

The responses from the interviewees did not reveal anything with regard to Bloom's taxonomy. This is because the researcher did not specifically refer to this model during the interviews, and the questions were focused on HOT skills.

To appreciate the extent of the QH approach and the collaborative roles of government, academics, employers and graduates fully, the conceptual framework depicted in Figure 5.3 should be read in conjunction with Table 5.3.

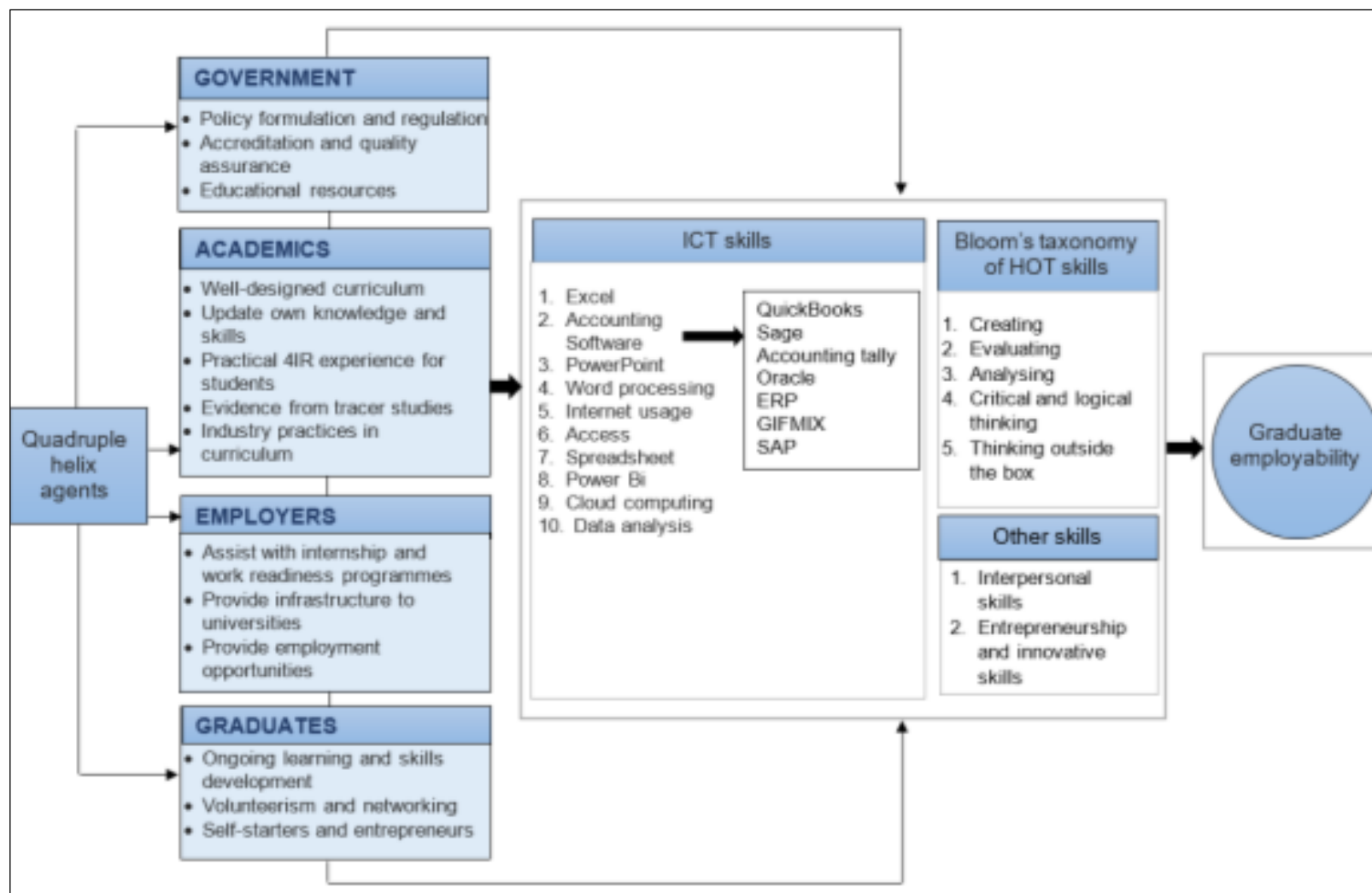


Figure 5.3: Updated conceptual framework for the development of skills for accounting graduates
 Source: Author's own compilation

In Figure 5.3, the connecting two-way arrows depict the collaborative working relationships among the four QH innovative agents of government, academics, employers and graduates as well as their roles in the development of ICT, HOT and other skills to enhance the employability of accounting graduates in Ghana. This will require that each agent thoroughly understands each other's role within the QH. The deep one-way arrow from the 'academics' box to the 'skills' box shows the critical role academics play in equipping graduates with the skills required for employment based on the accounting curriculum. Although academics play a major part, the entire QH approach in the current study was to include all other stakeholders to play their part.

It must be emphasised that, although graduate employability is the outcome of QH collaboration, the outcome for accounting graduates will be a graduateness profile with a best possible fit for employment or entrepreneurship. This will enhance quality of life and national prosperity as emphasised by Hasche et al. (2020:526) and Schütz et al. (2019:132).

5.9 TRIANGULATION

Previous studies considered that triangulation assists in ensuring cogency of qualitative research findings (see Carter, Bryant-Lukosius, Dicenso, Blythe & Neville 2014:545; Chako 2017:2), permits various perspectives on the current study (see Heale & Forbes 2013:98), and minimises bias (see Yeasmin & Rahman 2012:158). The four main methods of triangulation reported in literature are data sources, multiple theories, methodological and the researcher triangulations (see Heale & Forbes 2013:98). In the current study, triangulation of documents analysis data (refer to Table 5.1) and one-on-one in-depth interview data (refer to section 4.7.2) contributed in providing confirmation of the results. This may not only assist in providing validity to the study, but also permits various perspectives to inform the current study, thereby increasing information about the complex issue of unemployment of accounting graduates in Ghana.

The analysis revealed several areas of the accounting curricula of the universities that could be enhanced. It was evident that the curricula should emphasise the teaching of Microsoft computer packages, especially Excel, and accounting software, such as QuickBooks, Sage and ERP. In addition, a more practical approach involving the use

of ICT should be adopted by accounting academics in the teaching and assessing of accounting courses. The interview data also confirmed that it is not sufficient for accounting graduates to possess theoretical knowledge only. They also need to demonstrate the theoretical knowledge in the area of employment practically by obtaining, analysing, synthesising, evaluating and reporting accounting information (see Rkein et al. 2020:189). These findings suggest the enhancement of the ICT infrastructure of universities and upgrading of knowledge and skills of accounting academics in the use of ICT for effective delivery of their lessons.

5.10 AUTHOR'S REFLECTIVE JOURNAL

Literature reports that the reflections of the researcher assist in taking into consideration particular points and reflecting on why things were happening in a particular way at the time of the study (see Syed 2020:2), the modifications that need to be made to enhance the study, and the ways the various methods employed to gather and analyse the data have answered the research questions (see Mortari 2015:2). Because the researcher is the instrument of research in qualitative research studies, maintaining and utilising a reflective journal enabled the current researcher to make his feelings, thoughts and experiences a recognised aspect of the inquiry procedure (see Ortlipp 2015:703). The researcher's reflective journal captured experiences relating to the data collection stage of the study, some of which are shared in the following paragraphs.

In the first place, prior to conducting the interviews, the researcher personally submitted permission letters and shared information sheets – in addition to the ethics approval received from the university where the researcher is pursuing the PhD – to the offices of the registrars and/or administrators of the participating institutions and companies to seek approval from the authorities concerned. It is interesting to state that, initially, none of the institutions officially replied to the applications. The researcher actually had to spend considerable time pursuing the individual HoDs, lecturers and other officers through telephone calls and e-mail messages to obtain their consent for the collection of data.

Secondly, some of the graduate participants were initially reluctant to participate in the study. A major reason could be the security of the information – in terms of those who

would have access to the information and how the findings would be published – as they did not want to be identified with whatever they said. Furthermore, because the interviews were conducted in English, participants were afraid that they might make grammatical mistakes in their responses. However, the researcher assured them of the confidentiality and anonymity of the data as well as the security of the data to be collected, and told them not to be concerned about any grammatical inconsistencies in their responses.

Thirdly, as recommended by Ghani (2019:21), copies of the interview schedules were provided to all the participants so that they could read it to get familiar with the questions and prepare adequately before the interview date. However, some of the participants – particularly the employers – were unable to do so, which might have been due to a lack of time on their part.

Finally, the researcher experienced frustrating moments during the interviews. On several occasions, interviews scheduled with some participants were cancelled at the last minute after the researcher had travelled a long distance to the venue for the interview.

The joy of the researcher is that, eventually, he was able to recruit the right persons in terms of knowledge and experience who offered interesting information to assist in addressing the research questions. All these moments taught the researcher patience and trust in God.

5.11 CHAPTER SUMMARY

The current chapter presented findings from the study, which aimed to explore the ICT and HOT skills that accounting students in Ghana should possess upon completion of the accounting programme to enhance their employability. The findings are based on the interviews with the QH innovation agents, namely accounting academics, employers, government officials and accounting graduates. The findings indicated employment challenges among accounting graduates in Ghana. This is mainly because most of them do not have ICT and HOT skills as well as practical work experience, which are mostly required by employers in this era of information technology.

From the empirical data, it is evident that there is an increasing demand for accounting graduates to acquire ICT, HOT, entrepreneurial and interpersonal skills to adapt swiftly and achieve success in the current competitive working environment. Consequently, there is the need for accounting academics, employers, government officials and accounting graduates to collaborate in various ways for the development of such skills to enhance the employability of accounting graduates. The major areas of collaboration are co-creation of relevant accounting curricula, facilitating the work-readiness of accounting graduates, and CSR business establishment and support. Reference was often made to empirical and theoretical literature in order to substantiate the reported data and themes.

The findings obtained were used to evaluate and amend the original conceptual framework to constitute the final conceptual framework for the current study. The evaluation of the original conceptual framework was carried out through triangulation of the findings with analysis of the data, comprising answers provided by the research participants. Accordingly, the contributions by several stakeholders in the field of accounting were considered. The conceptual framework of the current study constitutes an innovative contribution to theory and the context of ICT, HOT and other employability skills requirements of accounting graduates.

In the next chapter, the findings are discussed and the analyses reported to answer the research questions, including the conceptual conclusion and knowledge contribution of the current study.

CHAPTER 6

CONTRIBUTION - SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

Chapter 5 presented the findings in the context of ICT and HOT skills of accounting graduates in Ghana. The current study aimed to examine the ICT and HOT skills accounting graduates in Ghana should possess upon completion of the accounting programme to enhance their employability. This had to assist in developing a framework for universities in Ghana for incorporating ICT and HOT skills in the accounting curriculum as a possible solution to the employment challenges.

First, the current chapter provides an overview of the study followed by the discussion and analysis of the findings in answer to the research questions. The chapter also presents major contributions of the current study in terms of theory and methodology. A further section concentrates on recommendations for accounting educational practice and employment creation. Finally, the chapter highlights further research areas in addition to the limitations of the current study. The outline of Chapter 6 is illustrated in detail in Figure 6.1.

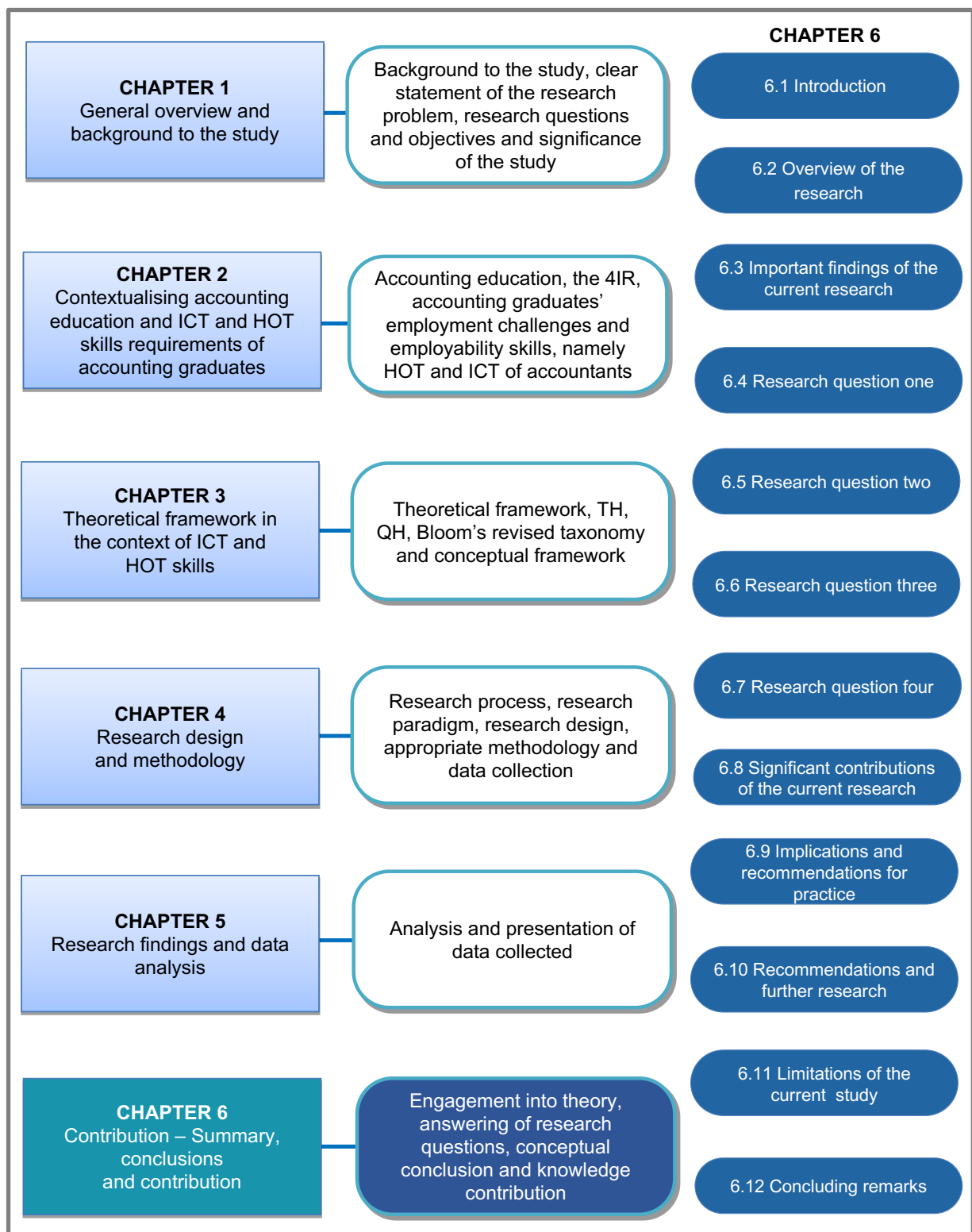


Figure 6.1: Structure of chapter 6

Source: Author's own compilation

6.2 OVERVIEW OF THE STUDY

The current study report comprises six chapters. Chapter 1 provided the background to the employment challenges of accounting graduates in Ghana in both broad and specific terms. The main reason for the employment challenges of the graduates was found to be a lack of ICT and HOT skills and competencies. Consequently, most graduates are considered to be incompetent to perform the tasks at the level required of them in the world of work. The chapter provided the justification of the study, namely that, with the arrival of the 4IR, where technology and digitisation significantly affect the tasks performed by accountants, this will further widen the demand–supply gap for ICT and HOT skills among graduates. Accordingly, the current study was set up to examine the ICT and HOT skills that accounting graduates in Ghana should possess upon completion of the accounting programme to enhance their employability. The author proposed that developing a framework for universities in Ghana for incorporating ICT and HOT skills in the accounting curriculum is a possible solution to the employment challenges of accounting graduates experience in Ghana.

After providing a comprehensive background to the current study, the research problem of the study was expounded, leading to the formulation of the research questions and objectives. In addition, the chapter described the significance of the current study together with the research design and methodology used for the study. Chapter 1 was concluded with the operational definitions for key terminology used in the study to ensure a general understanding and definition of terms of reference.

Chapter 2 contextualised accounting education and the ICT and HOT skills requirements of accounting graduates. The chapter explained the concept of ‘accounting education’ leading to the contextualisation of accounting education in Ghana with emphasis on university accounting education. The 4IR and its influence on the accounting profession, employability challenges of accounting graduates, and the different skills requirements of accountants in the twenty-first century with special focus on ICT and HOT skills were discussed.

The literature presented substantial evidence that university accounting education should evolve to fulfil business requirements by equipping students with the skills to provide accurate and relevant accounting and financial information for business

decision-making (see Ahmed 2019:21; Musov 2017:434). With the arrival of 4IR, professional accountants have to use sophisticated and advanced technologies to improve their conventional working methods (Ghani 2019:28). In order to remain in high demand, accountants must embrace the changes and be well versed in the use of the latest technologies. Consequently, universities should modify existing course contents or introduce new courses to develop and teach the required digital skills with the support of modern teaching methodology.

Chapter 3 described the theoretical framework of the current study in the context of ICT and HOT skills. The QH innovation model (see Carayannis & Campbell 2009:206) and Bloom's revised taxonomy of educational objectives (see Anderson et al. 2002:215), which constituted the theoretical framework of the current study were discussed. To enhance the understanding of the QH innovation model, the TH model (see Etzkowitz & Leydesdorff 2000:111), which focuses on the overlapping relationship between the spheres of government–university–industry in the knowledge society context was first explained.

The QH innovation model of the current study explained the network and the collaborative relationship between the four innovation agents – government, academics, employers and graduates – for the development of skills, ideas and creativity to enhance employability of accounting graduates in Ghana. Bloom's revised taxonomy was used to explain the HOT skills needs of the graduates. The chapter concluded with the depiction of a temporal conceptual framework for developing the relevant ICT and HOT skills of accounting graduates in Ghana for the purpose of satisfying the demands of employers and increase the employability of graduates.

Chapter 4 was devoted to a detailed discussion of the research design and methodological assumptions supporting the data collection and analysis. The chapter detailed the rationale for choosing pragmatism as the qualitative research paradigm and using a DBR methodology. The research participants, data collection methods, data management and analysis procedures were also described. The themes, categories and the related codes identified during the data analysis process (refer to Figure 4.2) were used as a basis for the reasoning, discussions and conclusion to the study presented in Chapters 5 and 6. The final section of Chapter 4 described how the

scientific rigour and trustworthiness of the qualitative data were ensured in addition to the ethical issues of the current study.

Chapter 5 presented the findings on the study based on the interviews with the QH innovation agents comprising government officials, accounting academics, employers and accounting graduates. First, the chapter described the socio-demographic information of the research participants. This was followed by explanation of the themes, categories and their related codes generated by appropriate and convincing direct quotes from the interviews. The findings were further corroborated by the findings from the document analysis and literature relating to the content of the themes generated in addition to the researcher's interpretations and reflections using field notes. The findings as well as triangulation were used to evaluate and amend the original conceptual framework to constitute the final conceptual framework for the current study (refer to Figure 5.4).

Chapter 6 provides an overview of the current study and an analysis of the findings presented in Chapter 5 in response to the research questions. It also provides theoretical and conceptual conclusions concerning the employment challenges of accounting graduates in Ghana. This very last chapter of the study further provides the contributions of the current study to knowledge, limitations of the study, and makes recommendations for future research.

The current study was guided by four research questions. These questions are discussed in sections 6.4–6.7 To obtain a thorough understanding of the employment challenges among accounting graduates in Ghana, a semi-structured interview schedule was employed (refer to Appendix F) to seek the research participants' experiences and perspectives. A total of 30 participants from the database of government officials, accounting academics, employers and accounting graduates, who were purposively and snowball sampled provided rich data to answer the research questions. In addition, documents were reviewed to generate data relevant to the study (see Appendix G). The documents reviewed and the responses from the research participants were crucial for the accomplishment of the current DBR study.

6.3 IMPORTANT FINDINGS OF THE CURRENT STUDY

The following constitute important findings of the current study based on the research data:

- Most accounting graduates in Ghana face employment challenges due to a lack of relevant ICT and HOT skills as well as practical work experience.
- Employers in Ghana prefer accounting graduates with professional qualifications to those with only academic qualifications because of the hands-on expertise, which professional qualifications are deemed to provide.
- The main aspects of ICT skills required by accounting graduates for sustainable employment during the 4IR are Microsoft Excel, accounting software, Microsoft Word and internet usage as well as cloud computing and data analytics.
- The HOT skills required of accounting graduates are the ability to analyse and interpret information that is processed for the purpose of decision-making. It also comprises the ability to demonstrate evaluation and thinking outside the box.
- In addition to the ICT and HOT skills, entrepreneurial and interpersonal skills also emerged as critical skills that accounting graduates need in the twenty-first-century work environment.
- Most public universities in Ghana lack adequate ICT infrastructure relative to the increasing number of students to support effective and practical teaching of accounting and ICT skills to accounting students. The methods of teaching and assessment of accounting and ICT are generally pen-and-paper-based rather than technology-based.
- Aside from their individual roles (refer to section 6.6), effective collaboration was required among the QH agents involved in this study, especially in the area of creating the accounting curriculum and facilitating the work-readiness of accounting graduates to enhance their employability and entrepreneurship, which are essential for quality of life and national prosperity.
- The QH innovation model can be used to explain the collaboration of the four groups of agents involved in the current study to assist with the development of graduateness of accounting graduates.

Section 6.4 below discusses and analyses the findings presented in Chapter 5 in reaction to the research questions. The research questions are discussed individually in order to enhance the strength of the discussion.

6.4 RESEARCH QUESTION 1

Research question 1

Should public universities in Ghana introduce new ICT and HOT skills in the curriculum of accounting degrees?

To answer this research question, it has to be stated once again that most newly qualified accounting graduates in Ghana are struggling to secure sustainable employment mainly because they do not have the ICT and HOT skills mostly required by employers in the era of information technology. The result is that accounting employers in Ghana are recruiting employees internationally due to a demand–supply gap for ICT and HOT skills (IFC 2019:45). There is consequently a mismatch of skills between what is offered by universities and the skills needed by employers. To bridge this gap, the literature reviewed (refer to sections 2.12 and 2.13) proposed an urgent integration of ICT and HOT-related courses in the accounting curriculum of universities to equip graduates adequately for employment. Otherwise, with the event of the 4IR, the employment challenges of the graduates would be worsening.

The interview data indicated employment challenges among accounting graduates in Ghana. As a matter of necessity, all the participants also endorsed substantive changes in the accounting curriculum to include advanced-level Microsoft Excel, accounting software, cloud computing, computer-assisted audit techniques and critical and logical thinking skills to be taught practically and be examined (refer to sections 5.6.1.1 and 5.6.1.2).

A study by Islam (2017:3) revealed that knowledge of accounting software, big data, cloud computing and other technologies are the core skill areas where accounting professionals are lacking. Accordingly, it would be necessary for universities to integrate new ICT and HOT skills in the accounting curriculum for the future needs of accounting graduates. This also suggests that an overhaul of the curriculum should

also ensure that teaching of accounting is technology-based rather than pen-and-paper-based. As concluded by Ackerman (2019:2), accounting academics should not be teaching accounting and ICT as though computers have not been invented.

The incorporation of such skills in the accounting curriculum would help graduates “to programme and carry out their learning activities and other schedules effectively” (GRAD2U1), and to “break beyond their thinking capacities and solve difficult personal and work-related problems” (GRAD1U4). What is more, adequate knowledge and competent demonstration of these skills would assist graduates to adapt swiftly and achieve success in the current competitive working environment.

6.5 RESEARCH QUESTION 2

Research question 2

Which ICT and HOT skills do accounting graduates in Ghana need for their career?

The second research question related to the ICT and HOT skills for accounting career (refer to sections 2.10 and 2.13). With the unprecedented pace of technological development, employers expect accounting graduates to acquire several 4IR ICT and HOT skills to be able to survive in the 4IR work environment (Chalkiadaki 2018:10; Dunbar et al. 2016:70; Zureigat 2015:234). Evidence from the interview data shows that Microsoft Excel, accounting software, PowerPoint, Word, internet usage, Access, spreadsheet, cloud computing and data analytics are the main aspects of ICT skills required by accounting graduates for sustainable employment during the 4IR (refer to section 5.6.1.1). The specific accounting software packages that the graduates must be well versed in using include QuickBooks, Sage, Accounting Tally, Oracle, ERP, GIFMIS and SAP. These findings are consistent with the literature (refer to section 2.10.4), which states that FreshBooks, QuickBooks, Sage Pastel Accounting, Tally. ERP 9, SAP ERP are the most popular accounting software programs that accountants need to perform their work effectively during the 4IR (see Williams 2020:1). The current study went further to provide a detailed discussion of the specific 4IR accounting software required for processing and presenting accounting

information to various stakeholders for decision-making purposes (refer to sections 2.10.1–2.10.7).

With particular reference to accounting software, the current study established that no one university can adequately teach all the various types of accounting software that are needed for the performance of accounting tasks. As a result, accounting graduates should be competent in basic computer skills, especially Microsoft Excel, and at least one accounting software program. Once they are competent in Microsoft Excel and one other accounting software program, they can get employment and learn to use whatever accounting software their employers are using while they are being trained on the job by virtue of their previous knowledge in Microsoft Excel and the accounting package they already know.

In terms of HOT skills, one participant required graduates “to demonstrate critical thinking, evaluation and thinking outside the box” (AS1U5) while another expected accounting graduates to “understand, analyse and interpret information that is processed for the purpose of decision-making” (GRAD1U3). Yet, another participant said, “the graduate should be able to think critically, especially when it comes to the issue of professional scepticism and questioning ability” (EMP1). As reported in the literature, the application of HOT skills, including creative problem-solving skills, is essential for accountants who want to be successful in their chosen career (Brazelton 2015:68).

In addition to the ICT and HOT skills, entrepreneurial and interpersonal skills also emerged as critical skills that accounting graduates need in the twenty-first-century work environment. Researchers (such as Asogwa & Dim 2016:39; Bokhari 2013:131; Dadzie et al. 2020:28; Oluseye et al. 2017:50) have confirmed that new businesses, as a result of entrepreneurship, contributes to a reduction in unemployment and an increase in economic growth. Likewise, exceptional interpersonal skills will enable accounting graduates to earn trust and admiration in their personal, working and business relationships (Obakpolo 2015:115).

To conclude, because the world is developing and businesses are also evolving due to technological advancements, the use of accounting software and HOT skills are becoming the order of the day. As a necessity, the accounting curricula of universities

should be transformed to develop these skills in accounting graduates. This is consistent with the IAESB framework depicting professional skills for accountants (refer to section 2.7), which shows that – in addition to sound knowledge in accounting and ICT – twenty-first-century accounting graduates in Ghana should display HOT abilities and exercise competent judgments. Incorporating and teaching these skills would not only enhance the analytical ability and general intelligence of graduates, but would also facilitate their employment and excellent performance of accounting and business tasks.

6.6 RESEARCH QUESTION 3

Research question 3

Which roles will government, academics, employers and graduates play in the development of ICT and HOT skills of accounting graduates in Ghana?

This section considers the roles that the government, accounting academics, employers and graduates could individually play in promoting development of ICT and HOT skills of accounting graduates in Ghana.

6.6.1 Individual roles of government

The roles of government in promoting ICT and HOT skills development of accounting graduates are described in sections 6.6.1.1–6.6.1.3 below, namely policy formulation and regulations; providing accreditation and quality assurance of accounting programmes; providing resources for improved gradueness and employability and creating an enabling environment for doing business.

6.6.1.1 Policy formulation and regulations

Concerning tertiary education, through the GTEC, the government manages and regulates policies and programmes in the higher education space in Ghana to conform to the existing national policies and strategic direction of the country. However, “there is no specific policy for training of accounting students” (GOV1). There is therefore a need for a specific government policy that would reflect on how accountants are trained

right from secondary educational level when learners are first introduced to the accounting subject to the tertiary level. There is further a need for “policies that would create more employment opportunities for them [accounting graduates] or assist them to create their own employment rather than relying on the government to employ them” (AS1U5).

6.6.1.2 Accreditation and quality assurance of programmes

The government provides accreditation of degree programmes through a statutory accreditation body as a hallmark of assurance that the programme satisfies the academic standards set by that body. This also applies to the accounting programmes of the public universities in the country. The universities are monitored to ensure that they deliver quality programmes to the students by accrediting and auditing the programmes, teaching content and staff, and eventually reaccrediting the programmes to ensure their validity and acceptance to meet international standards. This will ensure that the products of the universities are able to compete internationally. Even so, it was the opinion of one employer participant that “the government should ensure that regulatory institutions work more effectively when it comes to the training and certification of accountants” (EMP6). This may require strengthening the systems of the regulatory institutions and resourcing them for regular and effective monitoring of the activities of accounting training institutions to ensure that standards are not compromised. By doing so, the right calibre of accounting professionals will be produced to provide the required accounting services to businesses as well as government establishments.

6.6.1.3 Provision of resources for improved gradueness and employability

The importance of educational resources for the development of skills and competencies in students cannot be overemphasised (Badu et al. 2018:67). The current study described educational resources to include lecture halls, libraries, ICT equipment, learning and teaching materials and finance (refer to section 5.7.1.3). Adequate provision and utilisation of resources are necessary for quality teaching and learning and the realisation of the aims and objectives of every educational establishment (Usman 2016:30). Effective use of educational resources assists in holding the interests of learners and inspiring their thinking during the learning process,

which contribute greatly in achieving teaching objectives (Bušljeta 2013:67). Because the universities are owned and controlled by government, participants expect government to provide universities with the necessary resources to enhance teaching and learning and to achieve their ultimate goal of producing the human resources required by the country. As stated by one graduate participant, “the major responsibility of providing resources to public universities rest with the government” (GRAD2U4). It was also the view of some of the participants (GOV1; GRAD2U4) that the universities themselves should provide some of the resources that they need, especially ICT infrastructure. This is because, apart from receiving subsidies and grants from government, they retain all funds they generate internally.

6.6.2 Individual roles of academics

These roles of academics refer to fostering of gradueness, practical exposure of students to 4IR technologies, undertaking and disseminating evidence from tracer studies, and developing industrial practicum. Sections 6.6.2.1–6.6.2.4 summarise these roles.

6.6.2.1 *Fostering gradueness*

As revealed in the literature, accounting graduates have to be equipped to perform effectively and efficiently in the workplace (Chetty 2012:3; Coetzee 2014:887; Glover et al. 2002:303; Steur et al. 2012:863). Studies also revealed that an accounting graduate without the required skills and attributes that are linked to a particular position is not qualified to earn a (high) salary and will not be in high demand in the labour market (see McGunagle & Zizka 2020:15; Puckett et al. 2020:1). Employer participants required accounting academics “to conduct relevant research to identify and equip accounting students with the knowledge, skills and attributes that they need for employment or to establish their own businesses at the end of their qualifications” (EMP6). Various studies confirmed how critical academics are in fostering gradueness through a well-designed curriculum (Clarke 2018:11; Heang et al. 2019:1074; McCowan 2015:281). To perform this role effectively, accounting academics in Ghana should be encouraged to attend workshops and conferences continuously to update their knowledge as well as their research and teaching skills.

6.6.2.2 *Practical exposure of students to 4IR technologies*

With the arrival of the 4IR, many organisations are using accounting software and other technologies that can keep business transactions and produce financial reports accurately and efficiently (Jeremiah & Daferighe 2019:227; Tsiligiris & Bowyer 2021:4). Participants therefore expected future accountants to be exposed practically to 4IR technologies. As one of the employer participants pointed out, “the 4IR should no longer sound abstract to the graduates”. Accordingly, accounting academics must introduce future accountants practically to certain components of the 4IR, such as mobile devices, Internet of Things [IoT] platforms, location detection technologies, smart sensors, big analytics and advanced processes and data visualisation. Unfortunately, this is not the case in some of the public universities in Ghana (refer to section 5.7.2.3). They do not teach these technological tools; they are only mentioned to the students (refer to section 5.7.2.3). “The 4IR is about the use of technology at the workplace; the use of computers and other machines that would enhance the job of the accountant” (AS1U2). Accounting is no longer about the pen-and-paper recording of business transactions, reconciliations, reporting routines and validations (Jeremiah & Daferighe 2019:227). As a result, practically exposing accounting students and graduates to some components of the 4IR “will make them ready to embrace new technologies resulting from the 4IR” (EMP4) and be more competitive in the work environment.

6.6.2.3 *Undertaking and disseminating evidence from tracer studies*

Another important task that participants required of accounting academics is to conduct tracer studies at both academic staff and institutional levels. Tracer studies provide valuable information concerning the relationship between the university and the professional world of work and relevant stakeholders, including those responsible for accreditation in higher education (Nugraheni et al. 2020:110). Tracer studies provide valuable feedback not only for management of universities concerning their programmes but also for tertiary education policy formulation. The feedback from such studies will enable institutions to determine whether graduates are having employment challenges or not, and what the reasons are for either of the situations. In Ghana, no published information on tracer studies conducted to generate information about the employability and work-related skills of accounting graduates that could inform a

review of the accounting curriculum to ensure that accounting graduates are adequately trained for the employment market, could be found. This could be due to a lack of clarity among the QH agents in terms of who should take responsibility for such studies. Even if they know, there may be resource constraints to conduct the tracer studies. Limited tracer studies have been conducted successfully in Ghana (see Howard et al. 2021; Nudzor & Ansah 2020; Osei & Dontwi 2015) but these relate to graduates in other disciplines and with different areas of focus.

6.6.2.4 *Developing industrial practicum*

Participants advocated for practicum to be incorporated into the accounting curricula of all universities to enable students to get practical experience in terms of what they are being taught at university to enhance their employment after graduation (refer to section 5.7.2.5). In line with this, Caiyod, Escamillas, Guarina and Gesmundo (2015:66) report that relevant working experience is a key consideration of employers about an applicant's ability to perform well in a job. Januszewski and Grzeszczak (2021:1) also emphasise the introduction of industrial practicum in the programmes of universities because it provides an actual working environment where students could acquire career-related skills and practical work experience required by employers. Several studies agree that industrial practicum provides an opportunity for closing the gap between theory and practice (Binder & Baguley 2015:24; Januszewski & Grzeszczak 2021:1; Šimičević & Štetić 2017:58). This is because theoretical knowledge constitutes only a part of the total skills and competencies of graduates to secure employment. Therefore, it is incumbent upon universities not only to incorporate industrial practicum in the curriculum, but also encourage their students to participate in the attachment programme to equip themselves adequately for the employment market. Students should be able to undertake the attachment programme in the third year and for the entire academic year. This is because, at this level, students would be taking the main accounting courses to be able to connect well to the practical aspects of the accounting topics. To make the industrial attachment effective, it should be well supervised and assessed (EMP2).

6.6.3 Individual roles of employers

As found in the current study, employers are expected to play certain roles in terms of the development of ICT and HOT skills to fulfil their role of being employers. They should assist with effective work-readiness programmes (internships) and should support universities through investment and CSR.

6.6.3.1 Fulfilling their role of being employers

The interviewees were adamant that great responsibility rests with industries and other institutions to provide employment to graduated students. It has been established by the current study that, although universities employ some of their products, that is quite insignificant compared to other employers (government and the private sector). For employers to fulfil this vital role effectively, the qualitative data suggested that government has to provide the legislative space for the employers – especially those in the business sector – to capitalise on such legislative space. Government could, for instance, provide an enabling environment in terms of adequate policies, infrastructure, financial support and regulating the market for businesses to thrive. This environment would facilitate the establishment of new businesses and expansions in the operations of existing ones to eventually provide employment to newly graduated accounting students.

6.6.3.2 Assisting with effective work-readiness programmes (internships)

The interviewees highlighted that practical work experience is necessary to enhance the employment of accounting graduates, and internship is an indispensable means by which the graduate could acquire practical working experience. Accordingly, it is the responsibility of industry to assist in providing students with an opportunity to acquire the skills and practical work experience that are needed for the employment market. During the period of internship, students can acquire knowledge about specific software and other modern industrial facilities. Caiyod et al. (2015:52) posit that the completion of a university degree does not make one work-ready. Consequently, employers should not only be willing to provide an opportunity to students to acquire skills and practical work experience while they are at university, but also be ready to employ new graduates and train them on the job to hone their skills to perform their assigned duties. As noted in section 5.7.3.2, employers should see the opportunity for

students to do internship as a win-win situation and not a favour they are doing students.

6.6.3.3 *Supporting through investment and corporate social responsibility*

The findings of the current study revealed that government alone cannot provide all the infrastructure and equipment required or provide in all the financial needs of universities to enable them to train the human resources necessary for the country. The Education Strategic Plan (Ministry of Education 2018:55) indicated that, at the time, the government of Ghana provided about 55% of the overall funding of public universities and other tertiary institutions. The largest proportion of this was being spent on staff salaries (Ministry of Education 2018:55). Government however cannot be responsible for payment of utility services and salaries of university staff and also be responsible for all the infrastructural needs of universities. As a result, there is a need for industries – particularly those that would benefit from the products of the universities – to support universities in some of their needs through CSR (refer to 5.7.3.3). Studies have shown that universities seriously require investment from the corporate world to be able to produce the required manpower for the industries (see Dahan & Senol 2012:102; Malhotra 2017:2; Shaikh 2017:3). Malhotra (2017:2) particularly states that, because companies represent the labour market, they should continuously consider how they can assist in promoting relevant skills and competencies for the working space at educational level.

6.6.4 Individual roles of graduates

Based on the findings of the current study, the roles of accounting graduates in developing ICT and HOT skills to enhance their employability are described in sections 6.6.4.1–6.6.4.3 below, namely ongoing learning and skills development, volunteerism and networking, and developing the acumen to be self-starters and entrepreneurs.

6.6.4.1 *Ongoing learning and skills development*

One important way by which accounting graduates can secure employment and remain relevant in the workplace is to train and upgrade their knowledge and skills continuously. They should not limit themselves to what they have learnt at university. The nature of the accountant's tasks is constantly changing due to new IFRS

requirements as well as advancements in technology. Specifically, it was said “they can add professional certificates to their academic qualifications” (AS2U1). Accounting graduates must continuously “read to appreciate trends in the industries and what is happening in the economy without restricting themselves to only their areas of study” (EMP3). As revealed by both empirical data and literature, accounting employers prefer accounting graduates with both academic and professional qualifications for employment to graduates with only academic qualifications (Abdulrahamon et al. 2018:33; Asonitou 2017:7). This will help them to be more competitive in the employment market, and when they are eventually employed, they would be in a good position to support their organisations and the accounting profession.

6.6.4.2 *Volunteerism and networking*

The research data revealed that unemployed accounting graduates need to be involved in voluntary work and networking to enhance their employability. Volunteerism could be an important way of meeting people and expanding one’s network. In recent times, research have shown that about 80% of job vacancies are occupied by way of networking (Fisher 2019:1). Through networking and collaborations, accounting graduates who need employment can receive information about employment opportunities and can take advantage of them. In addition, through volunteerism unemployed graduates can obtain practical experience and ultimately create and add value to themselves. Through various platforms, the unemployed graduates could “compel the government to formulate policies that would help them to get employment or create their own businesses to earn sustainable income” (EMP5).

6.6.4.3 *Developing the acumen to be self-starters and entrepreneurs*

The current study required accounting graduates not to think only about government and companies employing them, but they must “capitalise on the knowledge and skills acquired and take risks, innovate ideas to create employment for themselves and others as well” (GOV2). This is because the Ghanaian economy is not expanding well enough to provide employment opportunities for graduates (Ministry of Employment and Labour Relations 2014:20). As established by various studies (see Asogwa & Dim 2016:39; Bokhari 2013:131; Dadzie et al. 2020:28), entrepreneurship contributes to a reduction in unemployment and an increase in economic growth. For accounting and

other graduates to be successful in any entrepreneurship venture, they need further training and financial support, including mentorship (Dadzie et al. 2020:28; Oluseye et al. 2017:50). This is in accordance with the QH theoretical innovation model, which emphasises the development of innovative products by involving users as co-creators (Carayannis et al. 2018:150). Consequently, it is important for government, financial institutions and other stakeholders to implement structures that would support start-ups to obtain the necessary resources to aid the creation and expansion of businesses to enhance employment.

6.7 RESEARCH QUESTION 4

Research question 4

How will government, academics, employers and graduates collaborate to promote the development of ICT and HOT skills of accounting graduates in Ghana?

This section is concerned with the corroborative roles of government, accounting academics, employers and accounting graduates in the development of ICT and HOT skills. The categories that resulted from the interview data classified these roles into three main groups: co-creators of a relevant accounting curriculum, facilitation of the work-readiness of accounting graduates, and public–private partnership business establishment and support.

6.7.1 Co-creators of relevant accounting curriculum

The current study established that universities are producing accounting graduates that “employers cannot readily use” (AS1U3). There is therefore an employment gap. This is because many relevant stakeholders have not been involved in the creation of the accounting curriculum of universities to develop skills required by the market (refer to section 5.7.5.1). To close this employment gap, accounting academics need to collaborate with appropriate stakeholders – especially employers and government agencies – who mostly make use of graduates, to determine the contents of the accounting curriculum to be beneficial to all stakeholders.

“Right from the stage of developing the modules, they must be shared with all the stakeholders and experts to provide inputs and how they can be modified to serve the future interest of the graduates and employers” (EMP3).

It then follows that the courses that the universities offer will mostly meet the requirements of the employers. This is in accordance with the QH theoretical innovation model, which emphasises the development of innovative products by involving users as co-creators (see Carayannis et al. 2018:150).

6.7.2 Facilitation of the work-readiness of accounting graduates

According to the interviewees’ responses and the literature consulted, newly graduated accounting graduates need ICT and HOT skills and work experience in a particular industry to enhance their employability (refer to section 5.5). This would require a collaborative effort of academics, employers, government as well as accounting graduates themselves. An academic staff member argued, “there is no amount of university or technical training that can make a graduate fully ready for employment” (AS1U4). As far as one graduate participant was concerned, “if there are more knowledge that accounting graduates have to acquire, that is going to come from the field” (GRAD2U1). An academics–employers–government–graduates’ collaboration would be required to provide the opportunity for accounting students as well as students and graduates of other disciplines to acquire the necessary skills and experiences that the employers are looking for (GRAD1U5). An academic staff participant (AS2U5) proposed in-depth discussion between these stakeholders where the university would provide a springboard from which the graduates can be trained further by employers – in both the public and private sector – to meet their specific skills needs.

6.7.3 Public–private partnership business establishment and support

The interview data revealed that, even though newly graduated accounting students could receive all the training that is needed, they may not be able to start and sustain their own businesses because they lack practical work experience and business management skills. There is therefore a need for more companies to be established, not only to employ newly graduated accounting students, but also to serve as the training and mentoring grounds for those of them who want to venture into

entrepreneurship. Government must provide an enabling environment and financing for start-ups and other businesses to thrive and also partner with the private sector to create more industries to employ graduates. Supporting the finding by the current study is the finding by Hwang (2017:7) that a collaboration between the private and public sectors is crucial to address the problem of unemployment holistically. The QH model also supports private and public sector collaboration to enhance employability of graduates and to promote economic growth and development (Hasche et al. 2020:526; Jackson & Chapman 2012:126). Again, government has to create practical employee recruitment and management policies in both the private and public sector for employing graduates.

6.8 SIGNIFICANT CONTRIBUTIONS OF THE CURRENT STUDY

The current study focused on how government, academics, employers and graduates can contribute to pursue innovation to improve accounting education in Ghana. The continuous collaboration and innovative efforts of QH agents will enhance the skills development and employability of accounting graduates. The current study makes both theoretical and methodological contributions.

6.8.1 Contribution to theory

Accounting education does not only play a significant role for the survival of businesses and industries; it is also a requisite for the economic, political and social development of a nation. A major difficulty of accounting education in realising this potential, particularly in Ghana, is however its inability to produce accountants with the relevant ICT and HOT skills to meet the demands of employers and the economy as a whole. With the rapid developments in technology and globalisation, many organisations are beginning to integrate advanced technologies in their business and accounting processes in order to survive during the 4IR (Cascio & Montealegre 2016:350). These factors cause a gap between the current ICT and HOT skills of accounting graduates and the skills needed by employers.

The QH theoretical innovation model (see Carayannis & Campbell 2009:206) submits that the collaborative work of the four development agents, namely government, academics, employers and accounting graduates, can develop skills and achieve the

desired outcomes of increased graduate employability. Similarly, Bloom's revised taxonomy (see Anderson et al. 2002:215) describes a progressive hierarchy of thinking skills, from the lower levels comprising remembering, understanding and applying to the higher levels of analysing, evaluating and creating. Relying on the QH innovative model and Bloom's revised taxonomy of educational objectives, the current study explored how these four groups of stakeholders could influence the development of ICT and HOT skills of accounting graduates to enhance their employability.

The results suggested that government formulates and provides policies, regulatory and infrastructure frameworks for universities to produce skilled graduates to satisfy the requirements of the employment markets. Academics conduct research and develop educational programmes oriented towards the development of skilled manpower for the economy. Employers take advantage of developments in knowledge to create products to meet public demand, which eventually create employment opportunities for graduates, while graduates grow their skills, capitalise on those skills to secure employment or take risks and innovate ideas to become employers, thereby creating employment for themselves and others. Consequently, there is a need for these four groups of role players to collaborate and use their respective and collective capabilities to foster graduateness and facilitate readiness for work or self-employment in accounting graduates.

While there exist systems within the QH theoretical innovation model to develop and produce accounting graduates, the systems are currently inadequate and not sufficiently sensitive or calibrated to support and facilitate accounting graduates to become ready for the world of work, employable or be able to be self-employers. Pivotal to such work readiness are HOT and ICT skills being taught and practiced effectively, both through academic and work-based programmes. The four respective agents all reflected on the current constraints within the system and the trajectory for improvement. Ghana needs to develop and position graduateness (the profile, skills, acumen and talents of accounting graduates) within the QH theoretical innovation model existing in the country. All four agents should use their respective mandates to develop and implement as well as monitor and evaluate policy, resources and strategies in order to make the Ghanaian QH innovation model and the collaboration among the four agents as effective as possible. The QH innovation model must keep pace with 4IR (soon to be 5IR [see Cai & Lattu 2021:255]) and to inculcate from the

global ecosystem of 4IR or 5IR relevant, appropriate and best use of HOT and ICT skills so that Ghana may develop, innovate and use its economy for employment or self-employment to meet its economic and sustainable development outcomes. This will also enhance quality of life for many and support national prosperity.

6.8.2 Contribution to methodology and practice

The current study was carried out in the context of ICT and HOT skills deficiency among accounting graduates in Ghana. The pragmatic philosophy of realism was employed to guide the current study because not only did the pragmatic philosophy matches how the researcher understands reality, but it also matched the aim and objectives of the current study. A qualitative research methodology based on a design-based approach to research was employed. The qualitative data was collected through document analysis and semi-structured interviews with accounting academics, accounting graduates, employers and government officials (refer to sections 4.7.1 and 4.7.2). The study followed thematic review procedures to identify, analyse and interpret important themes in qualitative datasets to address the research questions (refer to section 4.10). The DBR approach practically enabled iterative cycles of evaluation and the creation of the framework (refer to Figure 4.2). The DBR approach also connected appropriately with the adapted QH innovation model (see Carayannis & Campbell 2009:206) and Bloom's revised taxonomy of educational objectives (see Anderson et al. 2002:215) underpinning the current study during the data analysis. In line with the iterative cycles of DBR, a final framework (refer to Figure 5.3) incorporated the models applied as well as the various aspects ensuing from the study to develop a framework that will equip future accounting graduates with relevant ICT and HOT skills to enhance their employability and performance in the workplace.

Figure 5.3 demonstrates how the QH innovation model and Bloom's revised taxonomy of educational objectives were applied in the final conceptual framework of the identified twenty-first-century skills requirements of accounting graduates. As explained in section 5.5, the connecting two-way arrows depict the strong collaborative working relationships among the four QH innovative agents of government, academics, employers and graduates in the development of ICT, HOT and other skills (e.g. interpersonal and entrepreneurial skills) to enhance the employability and income generation capacity of accounting graduates in Ghana. The deep one-way arrow from

the 'academics' box to the 'skills' box shows the critical role academics play in equipping students with the skills required for employment based on the accounting curriculum.

6.9 IMPLICATIONS AND RECOMMENDATIONS FOR PRACTICE

As established by the findings of the current study, the employability of newly qualified accounting graduates in this era of information technology centres on relevant ICT and HOT skills coupled with practical industry experience. Based on these findings, the following recommendations are made for accounting educational practice and employment creation:

- The development of a curriculum that will equip accounting graduates with marketable skills should be a collaborative effort of government, accounting academics, employers, accounting graduates and all relevant practitioners and stakeholders in the field of accounting. As established in section 5.7.2.2, accounting academics are primarily responsible for developing the modes that translate into training of graduates with the requisite skills. They need to collaborate with appropriate stakeholders – especially those who mostly make use of the products of the universities – to determine the contents of the accounting curriculum to be beneficial to all stakeholders. A government–university–industry collaboration is also needed to ensure accounting students and graduates get opportunities to do internships to acquire relevant practical industry experience and skills to enhance their employability. Consequently, consultative and all-encompassing information and strategies should ensure that the needs of accounting graduates are factored into the development and implementation of accounting programmes to enhance graduates' employability.
- Accounting graduates need to enhance their ICT and HOT skills in addition to their professional and entrepreneurial competencies to enhance their employment. This would require accounting academics adopting technology-based teaching methodology that would practically expose future accountants to the relevant skills and competencies for the world of work. As demonstrated in section 5.5.1.1, the accounting curriculum must satisfy the practical and theoretical needs of the final products for the employment market.

- Practical integration and use of digital technology in teaching and learning cannot be possible without adequate ICT infrastructure and regular financial support to training institutions. Government needs to collaborate with financial institutions and other stakeholders to satisfy the ICT infrastructure and the financial needs of universities, now that education is not only classroom-based, but also virtual.
- Government should take a keen interest in the development of employable skills of university accounting students and graduates as well as those in other disciplines. This will assist them to acquire the relevant skill sets, think outside the box, and venture into entrepreneurship. Government also needs to provide an enabling environment and financing for start-ups and other businesses to thrive. This will contribute substantively to reducing the rate of unemployment in the country.
- Based on the document analysis of the curricula, the universities should redesign and increase the credit hours of the entrepreneurship course to enhance students' practical training. Where possible, students should be attached to entrepreneurs for mentorship and coaching.
- Both government and industry must actively implement internship programmes for accounting graduates in Ghana.

6.10 RECOMMENDATIONS FOR FURTHER RESEARCH

Based on the findings and the limitations of the current study, the following areas are worthy of consideration for further study:

- Further research can be done on how to improve computer laboratory and classroom facilities to enhance effective integration and development of ICT and HOT skills of accounting graduates.
- Future studies can be conducted to determine the most appropriate course or combination of courses in which ICT and HOT skills requirements of accountants should be included.
- A comparative study of ICT and HOT skills of public and private university graduates in Ghana can be undertaken.

- Future research could be conducted to validate the identified skills further using quantitative or mixed method research methodology for accurate comparison of findings.
- Future research could be conducted to examine factors that influence the level of ICT and HOT skills competencies of accounting graduates.
- Tracer studies on the employment situation of accounting graduates should be instituted at all universities. The result would assist to determine whether the graduates are having employment challenges or not and what the reasons are for either of the situations.
- Further research should also include the professional accounting bodies and how they could contribute and also be a part of a fifth helix (perhaps to create a penta-helix).

6.11 LIMITATIONS OF THE CURRENT STUDY

The current study was carried out bearing in mind scientific rigour, trustworthiness, research design and methodological requirements. However, as is the case with all research projects, there are possible weaknesses associated with the current study, as discussed below.

- This study was conducted in Ghana only, and focused on the top five public universities. The findings will not necessarily be directly applicable to other universities in the country, or elsewhere; however other institutions of higher education – especially those involved in educating accounting graduates – may also benefit from the results.
- In the current study, the concentration was on accounting graduates. The document analysis involved only the accounting curriculum of undergraduates, and only accounting academics teaching undergraduates were interviewed. A similar study, comprising document analysis of a postgraduate accounting curriculum and the views of accounting academics teaching postgraduates might produce different results as the postgraduate accounting programme does not have the same career emphasis as the undergraduate accounting programme.

- The current study employed purely qualitative research methodology, which is perception-based. The study nevertheless provided in-depth knowledge on the ICT and HOT skills of accounting graduates that might form the basis for future research on ICT and HOT skills of graduates in other disciplines.

6.12 CONCLUDING REMARKS

The current study explored ICT and HOT skills within the context of accounting graduates in Ghana with special reference to their inability to meet employers' skills requirements. Following a qualitative approach using a DBR methodology, it has been revealed that, to survive in the ever-changing technological work environment, accounting graduates must not only possess and demonstrate high knowledge in current ICT and HOT skills, but also should have entrepreneurial and interpersonal skills. Based on the findings, the researcher developed a framework that includes the roles of government, employers, academics and students to equip future accounting graduates with such skills to enhance their employment and performance in the workplace.

The current study makes a unique contribution to the present scarcity of studies on ICT and HOT skills using DBR methodology and application of the QH innovative model in accounting education, particularly at tertiary level in Ghana. The findings have implications for policymakers, practitioners and researchers – especially in the field of accounting education – who strive continuously to find innovative ways of improving accounting education to enhance economic growth and development.

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Appendix A: Ethics approval



UNISA COLLEGE OF ACCOUNTING SCIENCES RESEARCH ETHICS REVIEW COMMITTEE

Date: 6 October 2020

Dear Mr JST Zotorvie,

ERC Reference # :
2020_CAS_033
Name : JST Zotorvie
Student no: 64075796

**Decision: Ethics Approval from
6 October 2020 to 5 October
2023**

Researcher(s): Mr Justice Stephen Tetteh Zotorvie (64075796@mylife.unisa.ac.za)
Supervisor(S): Dr Annelien van Rooyen (vrooyaa@unisa.ac.za)
Prof CC Shuttleworth (shuttcc@unisa.ac.za)

**Working title of research:
Striving for innovation: A quadruple helix intervention for accounting education in
Ghana**

Qualification: PhD

Thank you for the application for research ethics clearance by the Unisa College of Accounting Sciences Research Ethics Review Committee for the above mentioned research. Ethics approval is granted for **document analysis and interviews** the period **6 October 2020 to 5 October 2023**.

*The **low risk application** was **approved** by the CAS RERC on **6 October 2020** in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the CAS RERC.



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Appendix B: Letter of permission



2020-10-30

**The Registrar
University of XXXX
P. O. Box XXX
XXXXX**

Dear Sir/Madam,

Invitation to participate in a PhD research study on the employability skill requirements of accounting graduates in Ghana

My name is Justice Stephen Tetteh Zotorvie, a PhD student at the University of South Africa (Unisa) and a lecturer in the Department of Accounting and Finance, at the Ho Technical University. I humbly invite your institution to join my study entitled “**Striving for innovation: A quadruple helix intervention for accounting education in Ghana**”.

The motivation of this topic stem from the fact that unemployment rates are high for accounting graduates in Ghana and though a number of studies have been conducted on employability skills of accounting graduates in other jurisdictions, limited studies have been conducted specifically on relevant information communication and technology (ICT) and higher order thinking (HOT) skills required of university accounting graduates by employers in Ghana.

As a key stakeholder in accounting education, your contribution will be highly beneficial to the study. I wish to state that the knowledge gained in the study will be available on request to your institution, accounting graduates, the government and other relevant stakeholders to enhance the employability of accounting graduates in Ghana.

Please find attached detailed information on the study. The researcher will do document analysis as part of the data collection strategies. With your kind permission, the accounting curriculum documents will be analysed. These documents will be treated with the highest confidentiality as demanded by the ethical code of research in both Ghana and South Africa. Two lecturers from the accounting department will be requested to participate in a face-to-face interview. In addition, contacts of two students who recently graduated from the accounting department and who are currently working in an accounting capacity will be required for similar interviews.

For further information on the study, feel free to contact me, my supervisors or the chairperson at the College of Accounting Sciences Research Ethics Committee at Unisa on the under listed addresses.

Thank you very much in anticipation of a favourable response.

Yours faithfully

Justice Stephen Tetteh Zotorvie
Tel. no: 020 210 3200
Email: jzotorvie@htu.edu.gh

Supervisors
Dr. AA van Rooyen
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Appendix C: Participant information sheet



2020-10-23

PARTICIPANT INFORMATION SHEET

Ethics approval reference number: 2020_CAS_033 (2020-10-06)

Title: *Striving for innovation: A quadruple helix intervention for accounting education in Ghana.*

Dear Prospective Participant

My name is Justice Stephen Tetteh Zotorvie and I am doing research with Dr AA van Rooyen, a senior lecturer in the Department of Financial Accounting and Prof. CC Shuttleworth, an associate professor in the Department of Management Accounting at the University of South Africa (Unisa) towards a PhD (Accounting Sciences). We are inviting you to participate in my study.

WHAT IS THE PURPOSE OF THE STUDY?

I am conducting this research to determine the information communication and technology (ICT) and higher order thinking (HOT) skills deemed essential by the accounting profession in Ghana in order to enable public universities to develop a relevant accounting curriculum to enhance the employability of accounting graduates in the country.

WHY AM I BEING INVITED TO PARTICIPATE?

Your contact details were obtained from your administrative or departmental/unit heads. There was no specific reason used to select you for participation in this research study, the only criterion considered is that a chosen participant must be:

- a public university accounting lecturer with three or more years' teaching experience, or
- a newly employed accounting graduate from public universities in Ghana who have graduated within 3 years from the university and are working in an accounting capacity, or
- employers of accounting graduates in both public and private sector organisations, or
- senior government officials from the National Council for Tertiary Education and National Accreditations Board of the Ministry of Education.

Approximately 30 participants will be interviewed. A summary of the participants is provided in the table below:

Participants	Number
Two newly employed accounting graduates who graduated from each of the five selected public universities.	10
Two accounting lecturers each from the selected five public universities.	10
Six employers from both public and private sector organisations to be selected from a directory of Ghanaian businesses.	6
Two government officials, each from the National Council for Tertiary Education and National Accreditations Board of the Ministry of Education.	4
Total number of participants	30



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WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY?

The study involves audio recorded semi-structured interviews, which are estimated to last between 40-45 minutes. The questions to be asked will relate to the following topics:

- i. Unemployment situation of accounting graduates in Ghana.
- ii. ICT and HOT skills required of accounting graduates in the wake of the Fourth Industrial Revolution (4IR).
- iii. The accounting curriculum of public universities in Ghana.

CAN I WITHDRAW FROM THIS STUDY EVEN AFTER HAVING AGREED TO PARTICIPATE?

Participating in this study is voluntary and you are under no obligation to participate. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time and without giving a reason, just inform the researcher via email, text message or telephone call.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

There are no direct possible benefits for individual participants. However, the data provided by participants will assist the researcher in fulfilling the aim set out in his research study and also provide relevant information about the ICT and HOT skills required by the accounting profession in Ghana to enable policy makers and public universities to develop a relevant accounting curriculum to enhance the employability of accounting graduates in the country.

ARE THERE ANY NEGATIVE CONSEQUENCES FOR ME IF I PARTICIPATE IN THE RESEARCH PROJECT?

There are no foreseeable negative risks associated with the participation in this research study. The foreseeable inconvenience to you for participating is your time, which the researcher requests you to kindly set aside for interviews as outlined above. All the information provided by you in this research will be treated as highly confidential and your name will never be used in any report of this research study without your consent. The information obtained from you will only be used for the purpose of this study, which may include publications in accredited journals. Where after the records on supplied information will be destroyed according to the university's policy on the collected data for research purposes.

WILL THE INFORMATION THAT I CONVEY TO THE RESEARCHER AND MY IDENTITY BE KEPT CONFIDENTIAL?

Your name, and that of your institution will only be known to the researcher and identified members of the research team. Your answers will be given a code number or a pseudonym and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings.

Your answers may be reviewed by people responsible for making sure that research is done properly, including the transcriber, external coder, who will be required to sign a confidentiality agreement and members of the Research Ethics Review Committee. Otherwise, records that identify you will be available only to people working on the study.

Your anonymous data may be used for other purposes, such as a research report, journal articles and/or conference proceedings. In whatever form your supplied data may be used your name and identity will always be kept confidential and private.



HOW WILL THE RESEARCHER(S) PROTECT THE SECURITY OF DATA?

Hard copies of your answers will be stored by the researcher for a minimum period of five years in a locked cupboard/filing cabinet at the office of Dr AA van Rooyen for future research or academic purposes; electronic information will be stored on a password protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. After five years the records of the data collected from you will be destroyed as follows:

- Hard copies will be shredded and/or
- Electronic copies will be permanently deleted from electronic devices.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

There are no payments or incentives for participating in this research study, participation is voluntary. Furthermore, there are no foreseeable costs that will be incurred by participating in this research study.

HAS THE STUDY RECEIVED ETHICS APPROVAL?

This study has received written approval from the Research Ethics Committee of the College of Accounting Sciences, Unisa. A copy of the approval letter can be obtained from the researcher if you so wish.

HOW WILL I BE INFORMED OF THE FINDINGS/RESULTS OF THE RESEARCH?

If you would like to be informed of the final research findings, please contact Justice Stephen Tetteh Zotorvie on 020 210 3200 or 055 7121 555 or jzotorvie@htu.edu.gh. The findings are accessible for five years. Should you require any further information or want to contact the researcher about any aspect of this study, please contact him on the previously mentioned contact details.

Should you have concerns about the way in which the research has been conducted, you may contact Dr AA van Rooyen on +27(0)12 429 4539 or vrooyaa@unisa.ac.za. Contact the Research Ethics chairperson of the College of Accounting Sciences Research Ethics Committee on +27(0)12 429 8844 or erasmlj1@unisa.ac.za if you have any ethical concerns.

Thank you for taking time to read this information sheet and for participating in this study.
Thank you.



Justice Stephen Tetteh Zotorvie



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Appendix D: Informed consent agreement for participants

INFORMED CONSENT AGREEMENT FOR PARTICIPANTS

I, _____ (participant name), confirm that the person asking my consent to take part in this research has informed me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and they were all answered to my satisfaction.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable).

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.

I agree to the recording of the semi-structured interviews.

I have read and understood this consent form and agree to participate in this research study.

Participant Name & Surname : _____ (Please print)

Participant Signature : _____ Date: _____

Researcher's Name & Surname: Justice Stephen Tetteh Zotorvie

Researcher Signature: _____ Date: _____



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Appendix E: Interview schedule

Interview Protocol: Semi-Structured Interviews: **Accounting academics (35 minutes – 40 minutes)** **Title: Striving for innovation: A quadruple helix intervention for accounting education in Ghana**

This research is mainly about Information and Communications Technology (ICT) and Higher Order Thinking (HOT) skills. ICT refers to all technical equipment such as data communication, voice telephony, computer and similar fields of technology required for converting, processing, saving and transferring different types of digital information. HOT skills involve not only the ability to think, recall, restate, or recite, but also the ability to connect different concepts, interpret, reason, solve problems, communicate and make the right decisions.

Date of interview:	
Time of interview:	
Place of interview:	
Interviewer:	
Interviewee:	
Highest education qualification of interviewee:	
Position of interviewee:	
Number of years teaching in this department:	
Proposed Questions	
1.	Do you think accounting graduates currently face employment challenges in Ghana? If yes, in what ways? If no, why not?
2.	What ICT and HOT skills do you think your accounting students should possess upon the completion of the accounting programme to enhance their employability?
3.	How would you describe your role in equipping future accounting graduates with required employability skills?
4.	What do you know about the university's policy measures with regards to the integration of employability skills, specifically ICT and HOT skills within the accounting curriculum? Any suggestions with regards to future policy initiatives?
5.	Does your university have the infrastructure required to effectively teach the ICT skills the students required for employment?
6.	What do you know about the Fourth Industrial Revolution (4IR) and how will it affect the nature and scope of the accountants' work in practice?
7.	In your opinion are the ICT and HOT skills in the accounting curriculum of your university adequate to enhance the employability of accounting graduates?
8.	Do you see the need to make changes to your accounting curriculum to include new ICT and HOT skills in the future? If yes, in what ways? If no, why not?
9.	What do you think is the best way to equip accounting students with a broad range of ICT and HOT skills that will prepare them for employment?
10.	Do you think collaborations with accounting academics, government, employers and accounting graduates are required to promote the development of ICT and HOT skills to enhance the employability of accounting graduates in the wake of the 4IR? If yes, in what ways? If no, why not?
11.	Other questions/notes

Interview Protocol: Semi-Structured Interviews: Accounting Graduates (35-40 minutes)**Title: Striving for innovation: A quadruple helix intervention for accounting education in Ghana**

This research is mainly about Information and Communications Technology (ICT) and Higher Order Thinking (HOT) skills. ICT refers to all technical equipment such as data communication, voice telephony, computer and similar fields of technology required for converting, processing, saving and transferring different types of digital information. HOT skills involve not only the ability to think, recall, restate, or recite, but also the ability to connect different concepts, interpret, reason, solve problems, communicate and make the right decisions.

Date of interview:	
Time of interview:	
Place of interview:	
Interviewer:	
Interviewee:	
Highest educational qualification of interviewee:	
Position of interviewee:	
Proposed Questions	
1.	From which university did you obtain your degree? In what year?
2.	Did you encounter employment challenges as an accounting graduate? If yes, in what ways? If no, why not?
3.	What method (manual or computer) does your organization use to record and process accounting information?
4.	What ICT and HOT skills do you think accounting students should possess upon the completion of their accounting programme to enhance their employability and performance of at the work place?
5.	Describe how the ICT and HOT skills acquired from your university are enhancing your performance of the accounting task.
6.	Are there ICT and HOT skills you perceived to be relevant for the performance of an accounting position, but were not covered in the accounting degree programme of your university?
7.	Did you receive any ICT-related job training sponsored by your employer just after being appointed?
8.	Please provide an example of how you have handled a critical decision while your supervisor is unavailable.
9.	Are the ICT and HOT skills in the accounting curriculum of your university adequate to enhance the employability of accounting graduates in the wake of the Fourth Industrial Revolution (4IR)?
10.	Does your university have the infrastructure required to effectively teach the ICT skills the graduates require for employment?
11.	Do you see the need to make changes to the accounting curricula of universities to include more relevant ICT and HOT skills in the future? If yes, in what ways? If no, why not?
12.	What in your opinion should the following stakeholders, individually or collaboratively, do to enhance the employability of accounting graduates: (I)Universities; (II) Industries (Employers); and (III)Government
13.	What role do you think accounting graduates have to play to enhance their employability?

Interview Protocol: Semi-Structured Interviews: Employers (35 minutes – 40 minutes)

Title: Striving for innovation: A quadruple helix intervention for accounting education in Ghana

This research is mainly about Information and Communications Technology (ICT) and Higher Order Thinking (HOT) skills. ICT refers to all technical equipment such as data communication, voice telephony, computer and similar fields of technology required for converting, processing, saving and transferring different types of digital information. HOT skills involve not only the ability to think, recall, restate, or recite, but also the ability to connect different concepts, interpret, reason, solve problems, communicate and make the right decisions.

Date of interview:	
Time of interview:	
Place of interview:	
Interviewer:	
Interviewee:	
Highest education qualification of interviewee:	
Position of interviewee:	
Proposed Questions	
1.	What is the specialisation field of your organisation?
2.	What qualifications do you consider when recruiting accounting graduates for your organisation?
3.	What challenges do you encounter in recruiting accounting graduates for your organisation?
4.	What method (manual or computer) does your organisation use to record and process accounting information?
5.	What skills, specifically Information communication and technology (ICT) and higher order thinking (HOT) skills do you consider relevant for the performance of accounting tasks in your organisation?
6.	What do you know about the Fourth Industrial Revolution (4IR) and how it will affect the nature and scope of the accountants' work in your organisation?
7.	Do you think the accounting graduates you employ are well equipped for the performance of the accounting tasks from day one in the wake of the Fourth Industrial Revolution (4IR)? If yes, in what ways? If no, why not?
8.	Are newly employed accounting graduates able to handle critical decisions while their supervisor is unavailable? If yes, in what ways? If no, why not?
9.	What do you think is the best way to equip accounting students with a broad range of ICT and HOT skills that will prepare them for employment?
10.	Do you see the need to make changes to the accounting curricula of the universities to include more relevant ICT and HOT skills in the future? If yes, in what ways? If no, why not?
11.	Do you think collaboration with academia, government and accounting graduates is required to promote the development of ICT and HOT skills of accounting graduates to enhance their employability? If yes, in what ways? If not, why not?
12.	Other questions/notes

Interview Protocol: Semi-Structured Interviews: Government Officials (35 minutes – 40 minutes) Title: Striving for innovation: A quadruple helix intervention for accounting education in Ghana

This research is mainly about Information and Communications Technology (ICT) and Higher Order Thinking (HOT) skills. ICT refers to all technical equipment such as data communication, voice telephony, computer and similar fields of technology required for converting, processing, saving and transferring different types of digital information. HOT skills involve not only the ability to think, recall, restate, or recite, but also the ability to connect different concepts, interpret, reason, solve problems, communicate and make the right decisions.

Date of interview:	
Time of interview:	
Place of interview:	
Interviewer:	
Interviewee:	
Highest education qualification of interviewee:	
Position of interviewee:	
Proposed Questions	
1.	What are the specific roles of your department regarding the development of accounting programmes of public universities in Ghana?
2.	Describe government policies for the education and training of university accounting students to enhance their employment after graduation?
3.	In your opinion, are accounting graduates currently encountering employment challenges in Ghana? If yes, in what ways? If no, why not?
4.	What ICT and HOT skills do you think accounting students should possess upon the completion of their accounting programme to enhance their employability and performance of at the work place?
5.	In your opinion, are the curricula of public universities able to satisfy the skills requirements of employers in the wake of the Fourth Industrial Revolution (4IR)?
6.	What do you think is the best way to equip accounting students with a broad range of ICT and HOT skills that will prepare them for employment?
7.	Do you see the need to make changes to the accounting curricula of the universities to include more relevant ICT and HOT skills in the future? If yes, in what ways? If no, why not?
8.	Do you think collaboration with academia, employers and accounting graduates is required to promote the development of ICT and HOT skills of accounting graduates to enhance their employability? If yes, in what ways? If no, why not?
9.	Other questions/notes

Appendix F: Independent coder certificate

INDEPENDENT CODER CERTIFICATE

JUSTICE STEPHEN TETTEH ZOTORVIE

I, Charmaine Williamson attest to being an Independent Coder (IC) for Mr Justice Tetteh Zotorvie in terms of his Doctorate of Philosophy study focusing on: "What ICT and HOT skills should graduates of accounting possess upon the completion of the accounting programme to enhance their employability?"

I am qualified to serve as an Independent Coder in my role as Academic Advisor within higher education and have thus served as Independent Coder for Mr Justice Tetteh Zotorvie with the documentation thereof submitted as a full methodological audit trail. This is a means to verify the trustworthiness of the research analysis process with regard to coding and categorising the data of the researcher.

I may be contacted in this regard for any matters pertaining to the IC working and for assurances in respect of the scholarly originality and autonomy of the student in the undertaking of the study.

SIGNED BY  on 30 July 2021

Charmaine Williamson
+27 082448 1195 or chammie@vodamail.co.za

Appendix G: Table of documents reviewed

Document type	Year	Aim of the teaching of accounting	Key focus of the curriculum
Undergraduate accounting degree curriculum:			
University 1	2017	<ul style="list-style-type: none"> To produce all-round accounting graduates to satisfy the requirements of various stakeholders in the employment market. 	<ul style="list-style-type: none"> Types of accounting degree programmes offered the duration of accounting degree programme; details of the semesters in which students are expected to take the required courses; total credit load for accounting degree programme; accounting skills; ICT skills; higher order thinking skills; and teaching methods and resources use in teaching accounting.
University 2	2018	<ul style="list-style-type: none"> To provide opportunity to students to develop skills and competencies in accounting and business-oriented subjects to the standards required by businesses world-wide. 	
University 3	2018	<ul style="list-style-type: none"> To produce quality graduates with practical knowledge and skills in accounting and administration to support the development of businesses as well as economies of Ghana and Africa. 	
University 4	2018	<ul style="list-style-type: none"> To produce accounting personnel and managers with the necessary knowledge, skills, attitudes and capacities to prudently manage funds and also demonstrate analytical and critical thinking skills at the work place. 	
University 5	2018	<ul style="list-style-type: none"> To produce graduates with the relevant knowledge and skills for quality performance in the field of accounting and be able to establish and operate accounting systems for business; and as well analyse financial statements for decision-making purposes. 	
Education Strategic	2018	<ul style="list-style-type: none"> To provide quality education service to equip students at all 	<ul style="list-style-type: none"> State-of-the-art laboratories, lecture halls and

Document type	Year	Aim of the teaching of accounting	Key focus of the curriculum
Plan 2018–2030		<p>levels of education with the skills, competencies to contribute to the achievement of the national goal;</p> <ul style="list-style-type: none"> to promote quality education, with an emphasis on science and ICT at all levels; to improve the skills and experience of tertiary staff and intensify research opportunities and postgraduate training; to improve counselling and career placement support for students and graduates; and to ensure sustainable and efficient management, financing, and accountability of education service delivery. 	<p>ICT requirements; and</p> <ul style="list-style-type: none"> strategies to strengthen the capacity of universities to deliver high-quality training and research.
ICT in Education Policy	2006	<ul style="list-style-type: none"> To promote the development and use of ICTs to enhance teaching and learning and management information; to train competent ICT graduates to meet the demands of the national and international employment markets; and to facilitate universal access to ICT infrastructure and services all over the country. 	<ul style="list-style-type: none"> ICT infrastructure such as laboratories, hardware, software and connectivity; initiatives for students and teachers to acquire ICT skills and develop interests in ICT; and strategies to achieve the goal of the ICT in education.
National Employment Policy	2014	<ul style="list-style-type: none"> To create more decent jobs to meet the growing demand for employment; to improve the quality of jobs for those who are employed; to increase labour productivity and; to address the employment situation, and deal with work deficits, targeting in particular, vulnerable groups, the youth, women and persons with disabilities. 	<ul style="list-style-type: none"> Strategies to promote and create sustainable employment opportunities for unemployed graduates; the impact of employment interventions on university graduates and; key implementation challenges of the youth/graduates' employment interventions.